Proceedings of The 2017 Association for Innovative Technology Integration in Education Conference:

That All May Integrate Technology forInstruction

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Sponsors:

AITIE
Creative minds innovate to transform the world.

They innovate through forward-thinking ideas to create the desired values.

Beyond the politics of educational research for certification lies the politics of educational research for transformation.

Only the network of dedicated and technology literate individuals can constructively integrate technology to support learning.

Through creative thinking, research and praxes we must Domesticate, Innovate and Integrate Technology for Instruction

This conference is dedicated to educators globally, the legends and pioneers who have made contributions into integration of media in the Nigerian educational system and to the members of the Association for Innovative Technology Integration in Education (AITIE) who have the desire to facilitate learning in variety of educational settings through innovative and creative use of technology

Vision

To be the foremost professional association in the integration of technologies for teaching, learning, research and administrative purposes in conventional and distance education settings.

Mission

We seek to be a force for qualitative accessible education, through the promotion of scholarship and best practices in the design, development, use, and innovative management of technologies for effective teaching and learning in a variety of educational settings.

Core Values

The following principles guide our work and define the mission of AITIE:

- **access to quality education:** a commitment to access to quality education for all, irrespective of location, gender, race, religion, disability, etc., as education is human rights and an instrument for poverty alleviation and sustainable human development;
- **excellence:** promotion of quality research, teaching, learning, and life changing scholarship and value-based service, through innovative use of technology
- **innovation and creativity:** encouragement of intellectual inquisitiveness through the promoting of technology for enhanced lifelong learning
- team work: encouragement of collaboration among individual and institutional members and promotion of shared values in the integration of information and communication technology in all aspects of education;
- continuing professional education: promotion of quality professional education for members and graduates already in workforce;
- **association, institutions and industry collaboration**: encouraging closer social, and economic ties among the Association, other professional associations, educational institutions, and the industry;
- **academic and professional integrity**: commitment to maintaining academic quality and standards, and integrity in all programmes of the association;
- **resources for teaching and learning**: commitment to providing resources for teaching, learning, research, and administration in conventional and distance education settings; and
- **professionalism**: expertise and judgment of educational technology and related media professionals are critical to successful integration of technology in education. AITIE maintains the highest professional standards, and expects the status, compensation, and respect due all professionals.

PRESIDENTIAL ADDRESS

Protocols:

It is indeed a great pleasure for me to welcome everyone to this maiden International Conference and Workshop organized by the **Association for Innovative Technology Integration in Education (AITIE)**. This Association is a professional forum for academics, non-academic media specialist, instructional designers, distant educators, and other stakeholders interested in improving teaching through innovative integration of emerging technologies for the sole purpose of facilitating learning.

As an Association, AITIE wishes to raise campaign on encouraging effective integration of emerging technologies through innovative and creative instructional delivery platforms, and as well provides opportunity for media specialist alike to acquire the necessary and appropriate skill in the discharge of day to day activities.

The application of technology in instruction encourages the integration of emerging technologies for instructional delivery purpose. The historical background of this professional field will not be completed without making reference to hands-on experience which perfectly explains the term **'Technology in Education'**. This conference is specifically organized to sharpen and improve media specialist skills in the promotion and development of positive attitude towards technology integration for innovative teaching. Hence, the choice of the conference theme: **"that all may integrate technology for instruction"**. The specific focus of this conference is to conduct practical sessions with regard to the identified workshop tracks in order to train media specialist on the integration processes involving the four major tracks: **Mobile app for instructional delivery, Microsoft tools for 21st century educator, Google application for educator and Instructional video production**.

Each track will guide the workshop sessions and subsequently expose us to the rudiments of integrating these identified media to support the primary purpose of facilitating learning among the leaners. The four tracks were specifically selected for this maiden workshop, which will be an annual exercise, because the trend in addressing instructional problems is still analogue in nature. But, media specialist needs to take advantage of emerging digital community of technological tools to simplify the process of solving identified instructional problems.

It is the hope and aspiration of AITIE that the workshop sessions will expose us to a better approach of solving identified instructional problems through innovative integration of technology for instruction. Furthermore, opportunity is also provided for media specialist attending this conference to engage in discussion and debate of choice in the **Special Interest Group (SIG)** forum throughout the conference. The SIG forum is to further the objectives of AITIE through constructive and intellectual discussion of interest among the members. Presently, these four SIG groups have been ratified by the interim executive council: Assistive Technology, Digital Game-Based Learning, Distance Education and E-Learning. You are free to join any SIG of your choice to debate and discuss pertinent, current issues.

I welcome you all once again to this conference and enjoin you to take the best of advantage provided by this congregation to create network of media specialist that will transform the face and identity of media for instruction through innovative integration in instruction within Nigera and beyond. Happy deliberations and enjoy your stay in Ilorin, the State of Harmony – Ire nbe bi

Prof. Ibrahim Olatunde Salawu
Interim National President,
Association for Innovative Technology Integration in Education (AITIE)

AITIE 2017 says Hello, and Welcome to the City of Ilorin, Kwara State

Ilorin City, the capital of Kwara State lies on 8.4799° N latitude and 4.5418° E longitude, covering an **area of**765 km². Ilorin with over 1million inhabitants in the North-Central Zone of Nigeria, is a confluence city of the diverse tribal heritage of the Nigerian nation. It has close affinities and links to the Yorubas, the Fulanis, the Hausas, the Nupes, the Barubas, among others. It is the western gateway city between the North and the South of Nigeria, a city with rich historical and cultural heritage. Major tourist attractionsites in the city include the Sheik Alimi Mosque, Emir's Palace, the Ilorin Central Mosque, Dada Pottery, Ilorin Museum, Asa Dam, Unilorin Lake Side, Unilorin Zoo, and so on. The town lives up to the epithet of the State (State of Harmony) as the City of Harmony providing a safe and conducive environment for people of diverse tribe, culture and religion.

It is a city with rich intellectual pedigree. Historically and contextually, Ilorin has been a centre of Islamic scholarship for over two centuries. Ilorin is home to several educational institutions. Apart from the primary and secondary schools, it houses three universities (one public, two private), six colleges of education (two public and four private), one polytechnic and two public schools of nursing and midwifery.

University of Ilorin, Ilorin, the venue for the 2017 AITIE Convention is a second generation federal university established in 1975. The University runs undergraduate and postgraduate degrees in over 90 academic programmes across fourteen faculties. University of Ilorin is one of the foremost universities in the sub-Saharan African with uninterrupted academic programme for over 16 years. Its products have excelled in several sectors nationally and internationally.

The Association for Innovative Technology Integration in Education is a professional association of academic and non-academic media specialist, instructional designers, distant education specialists, educational researchers and other stakeholders interested in improving teaching and learning through innovative and creative use of technology. The Association focuses on policies as well as technical issues and best practices required for success in technology application for both conventional on-campus and distance education (blended, synchronous and asynchronous online education, etc.). M**embership cuts across specialists in higher educational institutions, governmental ministries and agencies,** industry, museums, libraries, and several other places where members creatively plan and implement innovative technology integration for instruction.

The Editorial Committee for the conference proceedings considered a total of submissions and accepted after careful review. Out of these, were submitted as empirical research publications, as theoretical/position papers and as experience track publications. Several reviewers were involved in the review process and we appreciate them for their immense contributions.

Credits and Acknowledgements

We like to express profound gratitude to the volunteers who devoted their time and resources to the organization of this convention. In particular, We liketo thank the following people who worked on a voluntary basis behind the scenes to plan all aspects of the conference for over a year to make this convention a success:

- Interim Treasurer: Dr. Oluwakemi Olurinola, Olabisi Onabanjo University, Ago Iwoye;
- Secretary LOC: Dr. Hameed Olalekan Bolaji, Al-Hikmah University, Ilorin;
- Web Master/Workshop Facilitator: Sunday Olawale Koledafe, University of Ilorin, Ilorin;
- Workshop Facilitator: Muhammad Kamaludeen Jimoh, University of Ilorin, Ilorin;
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- Graphic and Printing: Musiliu Adekola Aderoju, University of Ilorin, Ilorin

I would also like to thank other members of the LOC (Prof. Samuel Adenubi Onasanya, Dr. Mosiforeba Victoria Adegbija, Dr.Nafisat A. Adedokun-Shittu Mr. Mohammed Rabiu Abdulrahman, and Mr. Oluwaseyi Ogunrinu) for their contributions. The assistance of AbdulRaheem Shehu Adaramaja is equally greatly appreciated.I also want to thank the staff of the Department of Educational Technology and the Educational Technology Centre for their logistic supports. I like to thank our sponsors: INDEMAC, YIO & HKB Media, Koldaf Concept, and University of Ilorinfor their very important financial and logistic supports.

Last but not the least, I like to thank the University of Ilorin Administration under the able leadership of Prof. AbdulGaniyu Ambali (OON) for the unquantifiable support provided for the successful hosting of the 2017 AITIE Convention.

Participants, we are happy you joined your colleagues interested in advancing the course of education. You are pioneers ready to explore technology integration for learning. You are welcome to the Better By Far University, in the City of Harmony, in the State of Harmony.
E kaa boo, e nle faa.

Mudasiru Olalere Yusuf,
University of Ilorin, Ilorin
Chairman for and On behalf of the Local Organising Committee for AITIE 2017 Convention

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A keynote Address Presented at the First International conference and Workshop on Innovation, Technology and Education

Abstract

The need to integrate technology into all instructional events by all is progressive. Technology is so pervasive that no teacher, or learner worth the name can ignore it. This discourse takes multi-views of the conference theme. It looks at practical ways of integrating two or more technologies in a multi-media instructional event and ways of blending all instructions such that technology is an integral part of the teaching and learning. It discusses rationale for the integration, major inhibiting factors to successful integration and outlines some best practices at integration of technology in instruction.

Preamble

Nigeria, like any African country is under pressure by accelerated globalization. She is facing a dramatic dilemma of establishing a high quality system of education quickly or face development regression. Information and Communication Technology (ICT) with their pervasiveness offer a rapid access and remedy to qualitative education yet the technology is either not available, inaccessible or not utilized.

Introduction

While Educational Technology is the study and ethical practice of Facilitating learning and Improving Performance by creating, using and managing appropriate technology processes and resources (Januszewski and Molenda, 2008), technology is the tool to support instruction, enhance access to quality education and training.

The Technology Concept

The word "Technology" comes from a Greek word, Technologia and was first used in 1859. It could be considered as a specialized aspects of the field of Educational Technology often used to show a manner of accomplishing a task when considered as a technical process. From the policy document on ICT published in April, 2012. The concept of technology is embedded in the applied science that deals with data and information communication (FME, 2012).

The tools of technology are available and to a large extent accessible to all stake holders in the educational industry. Availability and accessibility of resources may not always result in integration. For massive use of technology as proposed in this conference, there should be enabling factors like workable policy, trained facilitators, enabling environment and a reliable structure to monitor the implementation. Similarly, the Level of Technology Utilization in Nigeria schools does not match the level of awareness of these tools or appreciation of their in instructional values.

Justification for the Integration of Technology in Instruction.

Evidence abound in the works of the fathers of Educational Technology in Nigeria (Imogic, Agun, AjayiOnyemeji, Etc.) to demonstrate the fact that integration of technology is advantageous for the teachers, students, administrators of education industry, parents and proprietors of schools. It is advantageous for all:

To the Teachers:
- It provides tools for them to be more productive.
- Uses multi-institutional strategies, add novelty.
- Eases stress and reduce their work load.
- Provides avenue to be continually trained on the job as professionals (CPD); and learn along with the students who are digital natives.
- Turns from authority expert to facilitator of learning.
- Reduces mundane routine and create room for efficiency.

To the Students: It makes them take ownership and control of their learning time, pace, content and make them actively responsible for their learning.
- It ensures availability and accessibility of qualityresources economically.
- It aids easy collaboration.
- Enables dynamic media to be more readily exploited.
- It will make for the development of high-order skills through problem solving activities.

To the Administrators and Proprietors:
- Ensures availability of resources at affordable cost.
- Eases record keep through the use of databases.
- Ensures prompt retrieval of information for decision making.
- Ensures multiplicity of services provided.

To the Parents:
- It makes school and home connection feasibly and eases the monitoring of wards' progress.

Major Militating Factors Against Integration

What hinders integration? The understanding of integration of technology in any instruction is that ICT tools will be used to support the learning process. Whether the learning is offered from a Distance Learning System (DLS) or Computer Assisted Learning (CAL) or provided online (e learning) etc, all these systems will use a network of computers to deliver content, support discussion and interaction. Thus, of all the enabling factors to effective integration of technology into instruction, world of business and work, computer literacy holds sway.

Computer Literacy: A Sine Qua-Non for Effective Integration.

Of all the "enabler" to massive integration of technology for instruction. Computer Literacy holds sway to success. Computer is one indispensable tool of technology and everybody needs to be literate to use it. As a matter of fact, it is essential that every lettered individual be computer literate. It is the right of every citizen to be able to read and write. In analogous to reading, a computer puts out messages that require interpretation by the learner (the reader) and in analogous to writing, the learner (the writer) generates the messages that can instruct the computer on what to do. These are the two fundamental aspects of computer literacy. The concept of computer literacy is variously defined in the literature, but in this paper, it is regarded as existing along a continuum from general awareness to the user's ability to write programmes. It involves:

Mental Knowledge of hardware, software, data processing, computer concepts and application of computer to solve problem(s);

Attitudes towards computer (including a willingness to use it where appropriate in daily use situations without fear), and

Skills (requisite skills to operate the system, modify existing programmes to suit daily instructional needs and programming new application, etc.)

The knowledge and skills acquired in this area therefore could be very high, high, low or very low depending on the individual's exposure to computer technology and its facilities. Here lies the major problem to a successful integration for instruction.

The facilitators of learning must use highly skilled computer literates to drive the innovation. The policy statement on ICT in education had envisaged that the Federal Government will create a mass pool of ICT literate manpower using the National Youth Service Corps (NYSC), National Directorate of Employment(NDE) and other platforms as a train-the-trainer scheme for capacity-building. A closer look at the three tiers of Nigeria's education system reveals that no provision is specifically made in the national policy of education for ICT exposure to the would-be drivers of this innovation. Nigeria's objective for primary education for instance does not elicit the knowledge of ICT specifically. It is at this foundation level that the would-be users of technology should be impacted. At the initial teacher preparation levels, the training on ICT is sporadic. The result is that about 75% of professionally trained teachers lack expertise in courseware design and development.

Other Major Factors Militating Against Technoloy Integration In Nigerian School System Includes:

- Resource provision: -Most proprietors of schools using various plans (School Net Africa, Zinox collaborative initiative with Microsoft, Zinox initiative with First Bank PLC, Zenith Bank   ICT for youth empowerment scheme, Federal and State Governments donations to schools, NUC's, NgRen project etc.) endeavor to provide ICT tools like computers, radio receivers, television sets, PowerPoint projectors etc. However, to afford a 24 hour alternative power source to operate the equipment has always been a nightmare.

- Inadequate or lack of ICT infrastructure: - includes high cost of bandwidth, uneasy access to computer equipment and accessories at close proximity to the use area both at institutional and personal levels is inhibiting.

- Under funded school systems: -Generally, the overall education system is underfunded. Available funds are often used by administrations of schools to solve more seemingly urgent and basic survival needs like staff salaries and emolument.

- Institutional challenges in creating enabling environment that can promote active learning, critical thinking, knowledge creation and collaborative learning experiences. There is also the challenge of encouraging the birth and adopting of innovations in the system-and-administrative bottleneck.

Practicalizing the Use of Technology In Schools.

The present picture as regards the availability and use of technology in school is not bleak. There is the report of availability and use of ICT generally in Library Collection development in some institutions within the country (EmojorhoNwalo, 2009, Ekpo 2012). A survey of most private schools in the nation will show a wide use of ICT in primary and secondary schools. The picture is different in public schools and within institutions, there are gaps as well. Practical steps to ensure massive integration of technology in institution should be taken. These should include the following:

- Training all stakeholders to develop interest for creativity and innovative learning.

- Creating appropriate environment for ICT use in the class and around the school.

- De-emphasizing the structured school curriculum.

- Varying the format of class activities and take home assignments.

- Emphasizing the continuing professional development of teachers.

- Sourcing for alternative power supplies to school to ensure availability of power supply (bio-fuel; solar energy etc.)

- General improvement of funding structure for education sector, and

- Monitoring of teaching and mentoring of teachers.

We all must be willing to learn and explore in order to develop interest in creativity and innovative learning. Harvey Norman rightly observation, "Anyone who stops learning is old, whether this happens at the age of 20 or 80 years. Anyone who keeps on learning not only remains young, but becomes consistently more valuable regardless of physical capacity".

Conclusion

It is impossible to guarantee a high quality education for Nigerian youths if they are disconnected from the rest of the world in this age of internet services. Scholars are quite conscious of what they lose by not being connected with the rest of the world. Once internet access is in place, creation of digital local content stimulates the rapid use of technology especially if this local content drives users to complimentary web resources, as it frequently happens.

From this discussion, it is obvious that Nigerian school systems, primary to tertiary are sufficiently sensitized as to the gains of ICT in their teachings and learning. They are ready for e-learning as soon as computers and network are put in place and the pedagogical considerations are attended to. Teachers are equally waiting patiently to be equipped for the dissemination of the innovation involving technology. Teachers should therefore be encouraged to use as much of the available software in their daily class instructions. For instance, the technology to use Microsoft Word, Excel, CorelDraw and PowerPoint Programmes should be integrated into anappropriate teaching and learning events. All teachers should endeavor to communicate with their pupils/students using email. Course content and class assignment should be sent online through such medium. By this development, the students will learn to interact and collaborate with peers using blended learning strategies. This way, all will eventually integrate technology for instruction.

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HOW REAL IS VIRTUAL REALITY IN EDUCATION: AN EXPOSITION

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Abstract

The trends in Information and communication technology are ever changing likewise it effects and dimensions on all facets of life. ICT has moved from Web 2.0 and gradually progressing to Web 3.0 but currently adopting Virtual Reality (VR) to improve 3.0 advancement. Educational and instructional technology has been trying to pace with the unstoppable move of ICT especially in designing computer based tools for instruction. This work tries to expose tech-savvy educators to the world of VR and digest possibility of venturing into this virtual reality world to enhance teaching and learning. Virtual Environment enables both teachers and students to interact with one another in such an immersive way with the aid of immersive projectors or lens, but in an avatar state reducing the stress of being in a place physically before knowing the contents or structures. In essence, this paper tries to sensitize educators in how to create a new course of direction in instruction. It is an exposition aiming at gingering instructors to keep pace with their counterparts in the developed world.

Introduction

Everyone has their "first time experience with Virtual Reality story. These first VR experiences are often profoundly transforming, providing breakthrough glimpses into artificial realities that were previously only present in our imaginations (IAB, 2016; Bell, 2008). As some were still amazed with wonders of Web 2.0, Web 3.0 come to compliment it. Virtual Reality (VR) typically refers to as computer technologies that use software to generate realistic images, sounds and other sensations that replicate a real environment (or create an imaginary setting). It simulates a user's physical presence in this environment, by enabling the user to interact with this space and any objects depicted therein. This is achieved using specialized display screens or projectors and other devices (Avatar, 2009). Coates (1992) defined Virtual Reality as electronic simulations of environments experienced via head mounted eye goggles and wired clothing enabling the end user to interact in realistic three-dimensional situations. In other words, Virtual reality is the creation of a virtual environment presented to our senses in such a way that we experience it as if we were really there. It uses a host of technologies to achieve this goal and it is a technically complex feat that has to account for our perception and cognition. It has both entertainment and other serious uses (Darwin, 2009). Seipel (2012) succinctly defined VR as a mediated environment which creates the sensation in a user of being present in a (physical) surrounding.

Undoubtedly, VR has attracted a lot of interest in few years. Being a new paradigm of user interface it offers great benefits in many application areas. It provides an easy, powerful, intuitive way of human-computer interaction. The user can watch and manipulate the simulated environment in the same way we act in the real world, without any need to learn how the complicated (and often clumsy) user interface works. Therefore many applications like flight simulators, architectural walkthrough or data visualization. It brings about the birth of a multi user VR experience where users from different locations can interact with each other in the same virtual location. These properties of VR could be used in the transformation of educational dissemination (Alger, 2015).

VR in Education

As educational tools are widely and increasingly available, the need to improve on those tools is equally unsaturated. The yesteryear tools in educational and instructional technologies cannot and will not match the technology savviness of the modern day students even pupils. Therefore, in order to keep the tempo of continuous learning up, the teachers/lecturers should be equally up to task, not just sitting behind computer makes one become guru but the ability to transfer such knowledge by using appropriate tools.

Several subjects at primary and secondary school levels subjected pupils and students to imagination and fantasy. Let's take Geography as a case, students were aided mostly by pictures of natural phenomenon they came across in their study. Thereby, leaving such students to pictorial imagination. However, with the aid of virtual reality such student can travel and navigate the entire planet from the keypad of his computer. Efficacy of such a learning tool cannot be overemphasized and level of assimilation would likely improve.

Another example are Religious studies, numerous *virtual haj which enables students to understand all haj rites, by simulating themselves to be in Mecca and Medinah environment whereas they were within the four walls of their classroom. Post-secondary school tends to benefit more in the VR educational tool concept, courses such as but not limited to Management sciences, Medical, Education, Biological sciences, Chemical sciences, Agricultural studies, etc.
Apart from aiding some courses offered at the institutions, VR can also be used in promoting such institution. Some universities has fortified their websites with virtual tour, this move has potential to increase the visibility of such an institution, abuad.edu.ng provides a 3D dimensional view of the university (Abuad, 2018)

VR in Agriculture

Developing and under-developed countries were mostly blessed with enormous land size though grossly under-utilized. Despite that, major cities in these countries were populated with numbers of tertiary institutions as in the case of Lagos state with its land size yet, it accommodates numbers of universities. Abuja is not left out of this equation, trying to compete with other major cities, despite the price of land in those cities. However, the National University Commission (NUC) demanded 250 hectares of land-size for a university to get operational approval. In the attempt of these big cities based universities to meet the NUC criteria, some of them have relocated to neighboring states where land is relatively cheaper. Imagine these urban-bases universities offering agricultural sciences in a place where land values as gold. This might lead to producing Agriculture science graduates that never hold hoe nor cutlass.

Virtual reality could be a tool to be deployed in solving this problem, no doubt there must be available farmland for practical sessions, but conveying these students to and fro might be too costly to sustain, therefore introducing a VR farm practices to complement actual farm activities will help go a very long way in students' assimilation and understanding of the course.

VR in Medical Science

Because imaging technology is so pervasive throughout the medical field, it is not surprising that, this domain is viewed as one of the more important applications for virtual reality systems. Most medical applications deal with image-guided surgery. Pre-operative imaging studies (e.g. CT or MRI scans) of the patient provide the surgeon with the necessary views of the patients' internal anatomy. From these images, the surgery can be planned. Visualization of the path through the anatomy to the affected area where, for example, a tumor must be removed, is done by first creating a 3D model from the multiple views and slices in a preoperative study (Calongne, 2008). Also, VR can be applied so that the surgical team can see the CT or MRI data correctly registered on the patient in the operating theater while the procedure is progressing. Being able to accurately register the images at this point enhances the performance of the surgical team and eliminates the need for the painful and cumbersome stereotactic frames. The most complex and longest recorded surgery ever performed (96 hours) to separate twins conjoined at the head, was preceded by months of training and planning using VR technology. The surgeons found VR an invaluable tool to achieve success in this unprecedented surgery (Calongne, 2008; Sundstrom, 2015).

Advantages of VR

VR clearly has tremendous potential, Koenraad (2008), which has already been demonstrated in industry, commerce, and the leisure communities. A continuing issue, however, is how virtual reality would gain acceptance especially in education sector? To answer this, one must consider the advantages that VR can offer, specifically in 3D perspective and communication.

The act of teaching and learning needs lecturer ability to sustain students' attention throughout the class session, and this is to be provided through what VR experts termed as "immersion," "presence," and "empathy" to highlight the difference in storytelling capabilities that VR brings (IAB, 2016). "We all know how hard it is to capture someone's attention and do it well with traditional media forms. VR offers a novel way to engage with people on a much more immersive basis." (McCurry, 2016)

3D Perception

The shape of objects and associated interrelationships remain ambiguous without true three-dimensional representation. The perspective projection onto a flat surface on a normal computer screen can be unclear. VR removes this ambiguity, and therefore represents a fundamental objective in design processes. Of particular importance is the sense of scale that can only be conveyed by immersing the analyst or designer in the "design" itself.

Communication

Sherman and Craig (2003) claimed that VR promises to completely revolutionize the use of computers for cooperative work interaction. Natural human interaction is not easily achievable in two dimensions. Shih, 2008 identified the weakness of telephone or videophone but he claimed that when participants share a common location, they have the freedom to more easily and naturally communicate ideas (i.e. engineers from Aba and Germany simultaneously discussing a model of a car in the design process). When multiple participants are involved then the VR environment is said to be a *Collaborative Virtual Environment (CVE).*

Immersive multi-user environment (IMUE)

Another advantage of VR is the time to create a new experimental environment where the IVR and IMUE are merged into a single framework in which several humans can interact, communicate and cooperate in a highly immersive virtual environment. In this experimental environment it will be possible to account for the social nature of perception and to perform experiments in which we can investigate real-time human interaction (Brooks, 1999). For this immersive environment it is required that the standard technical setup is extended by three important features: synchronous real-time tracking of multiple rigid bodies, a distributed application to render one virtual world from dierent perspectives (for each user) and the usage of avatars to enable users to identify and localize each other. In this setup participants can interact with the world and with others from an egocentric perspective by using their physical body as an interaction device (Sherman and Craig, 2003).

Types of VR System

Not all Virtual Reality systems require gloves and goggles, such as are seen in most technological amusement centers and scientific magazines. A major distinction between VR systems pertains to the mode with which they are interfaced to the users. The following sections describe some of the common modes used in VR systems, including Video Mapping, Immersive Systems, Daydream and Telepresence (Linden, 2006).

Immersive System

The most advanced VR systems completely immerse the user's personal viewpoint inside the virtual world. These "immersive" VR systems are often equipped with a Head Mounted Display (HMD), a BOOM, or other types of VR peripherals. An HMD is a helmet or a facemask that holds the visual and auditory displays. The helmet may be free ranging, tethered, or it might be attached to some sort of a boom armature. A nice variation of the immersive systems use multiple large projection displays to create a 'cave' or room in which the viewer's stand (Shih & Yang, 2008).

Teleprescence

Teleprescence is a variation on visualizing complete computer-generated worlds. This is a technology that links remote sensors in the real world with the senses of a human operator. In the virtual world, this technology has been used in medicine (called telemedicine), robotics (called telerobotics), firefighting, underwater exploration and space exploration, as well as others. One of the major uses of the technology is in medicine. Surgeons use very small instruments on cables to do surgery without making large incisions in their patients. The instruments have a small video camera at one end. This technology potentially enables future surgery to be performed remotely. Robots equipped with telepresence systems have already been used in deep sea and volcanic exploration (Linden, 2006). NASA is currently researching the use of telerobotics for space exploration. Therefore, while telepresence does not create a virtual world for the operator, it does give the user enough visual and audio information to make him feel as though he were virtually present (Avatar, 2009).

Daydream

This is a virtual reality (VR) platform developed by Google in 2016. Contrasting from Google's first VR platform, Google Cardboard, Daydream is built-into the Android operating system starting with the release of Android 7.1 Nougat. The platform includes both software and hardware specifications, designating compatible phones "Daydream-Ready". Google has also announced a VR mode in Android Nougat to handle high computation needs of virtual reality apps. Google plans on enhancing some of its stock Android apps to be VR apps at relatively lesser price (Isaac, 2016).

Visual Display Transformations

The visual display transformation for VR is much more complex than in standard computer graphics. On one hand, there is a hierarchical scene database containing a number of objects (like in standard computer graphics) and on the other hand is the user controlling the virtual camera by moving his/her head, flying through the world, or manipulating it (e.g., scaling). To provide a proper view of the scene, all these components are to be taken into consideration. The determination of viewing parameters involves the calculation of a series of transformations between coordinate systems (CS) that depend on hardware setup, user's head position and state of input devices. This section describes how to calculate display transformations for rendering of monoscopic images; for details concerning the generation of stereoscopic images refer to the next section (Chitaro, 2007).

Tools

Multi user Virtual Discussion environment gives the users a 3D view of a virtual world created to look real and interactive, which will aid them in terms of communicating with one another irrespective of their location at a particular time, available on devices running the Android Operating system and Windows platform with stable O/S. This Environment requires gears like Oculus VR Gear, or a Samsung VR Gear or a Google cardboard VR Gear. Any of these gears can work on the specified compatible smartphones. These gears enable images to appear life to the user, they change as the person moves around their environment which corresponds with the change in their field of vision. Unity should be downloaded and installed, follow by Android SDK and auto walk scripts (Noon, 2015).

How to create VR
Noon (2015) highlighted some steps that make creation of VR application simple:
create a VR environment by Open Unit
set up a Cardboard Unity SDK,
then add auto walk function in order to toggle auto walk using the trigger in VR

Conclusion

VR has come to stay as another tool for dissemination of knowledge, though the learning process may be seen cumbersome and highly technically oriented. However by breaking the development process into smaller units, it would aid the learning and development of VR, thereby making the Training of the Trainers an appropriate approach. The developing worlds should not join the team of laggards in the ever consistently changing world but continue to advance in the mode of learning and dissemination.

Recommendation

As an expository paper, the aim is to ginger education and instructional technology communities to be part of makers of tools not just users. The world around us is fast moving and dynamic, therefore making an expedient move is a must, not just by training instrucors but also forming teams of creators of developmental knowledge.

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Acknowledgments

TOWARDS ENHANCING QUALITY LEARNING AMONG UNDERGRADUATE STUDENTS IN NIGERIA'S UNIVERSITIES: THE PLACE OF SOCIAL MEDIA NETWORKING

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Abstract

Given that social media networks have proliferated rapidly, it was hypothesized that the classification of universities attended by undergraduate students would influence their utilization of social media. It was felt that students in privately owned universities as a result of their higher family background, better social status and economic advantage which should afford them a better access to electronic devices and telecommunication gadgets would make a better use of social media for learning than their counterparts in public universities. Two research hypotheses were tested in this study, a descriptive research of the survey type was employed, and 635 undergraduate students were sampled from a privately owned and a public university. Two validated research instruments tagged 'USSMCUS' and 'USSMFU)' which were found reliable were used to gather data. Although, as a whole, there was a significant difference in the utilization of different social media concepts for learning by undergraduate students in both privately owned and public university, there was not a significant difference between most of the individual forms of social medium. It was found that the extent of social media network utilization by undergraduate students in public universities for learning was low. In privately owned universities on the other hand, the utilization level of social media network was high. Since there was no evidence indicating that undergraduate students in the two universities had particular interest and affinity for specific forms of social media networks and that this interest led to their extent of utilization, this was recommended for further studies.

Keywords: *Electronic Devices, Mobile Digital Devices, Social Status, Public-Owned University, Privately Owned University*

Introduction

The revolutionary tide blown across the globe by the proliferation of Information and Communication Technologies (ICTs) has left no stone unturned as it has impacted on our social, cultural, economic, political, religious and most peculiarly educational life. The interactive networks of internet accessed through telecommunication gadgets gave rise to the use of ICT in our daily lives. Aderogba and Abanikannda (2009) stated that there has been an increased interest in the use of electronic network to support distance and electronic learning around the world, which has assisted collaborative learning and also provided access to electronic libraries and multimedia education. This system unequivocally metamorphosed into electronics super highway called ICT. The use of ICT has assisted greatly in connecting and interacting with a very wide and unlimited audience all over the world.

The connectivity brought about through ICT has consequently led to the advent of social media networking through social networking sites. Baruah (2012) referred to social media networks as the use of web-based and mobile technologies to turn communication into an interactive dialogue. These social media networks have become so popular that students rarely live without them. Boyd and Ellison (2007) defined social network site as a web based service which allows people to sign up in a bounded system while articulating group of people within the same system for the purpose of sharing personal as well as

academic related information. McCann (2012) spoke about social media as online platforms for keeping in contact with their peers.Social media such as Facebook, Google, MySpace and others are designed to facilitate social interaction and information exchange (Barczyk, 2013). Other media include Faces.com, Faceparty, Livejournal, SixDegrees, 2go, Whatsapp, Twitter, Tumblr, Plurk, Messaging, Geocities, MySpace, Google +, Friendster, IRC and Instant, LinkedIn and most recently Telegram.

Social media networking has become part of daily life experience for an increasing number of students using social networks. The advent of globalization as a result of urbanization and civilization such as internet, global system of mobile communication, television and cable network programmers have relegated by series of online dating and blog. Abanikannda (2016) claimed that social media has been accused of displaying studying time and thereby impending intellectual abilities. Contrarily, he stated that for quite a while however, social networking has been a very important instrument for facilitating academic activities in tertiary institutions in Nigeria and beyond due to a howling growth in the use of the internet and the World Wide Web. Abanikannda established further that in contemporary world, social media has been a vital tool in the hands of undergraduate learners. Griffith and Liyanage (2008) found that instant messaging, wikis, blogs, discussion boards, and other Web 2.0 facilities could provide support which can complement what is taught in a traditional classroom setting.

Oghenetega and Ejedafiru (2014) observed that social media have affected communication between people in educational community positively since the past decades, which has made life easy by this media in different areas such as academic, social and political for any that is connected to it. Awake (2011) attested to this when he submitted that social networking has become hugely popular. Olasunkanmi (2010) worked on social networking as a collaborative learning tool for distance learning students, his findings revealed that social networking as a collaborative learning tool develops higher level of thinking skills, enhanced students' satisfaction with the learning experience and develops social interaction skills.A study by Raihan, Hasan & Shamim (2013), stipulated that, online social networks have all components of fostering modern learning by promoting interdependent, personalized learning, learner centered in the process of acquiring knowledge. Towner and Muñoz, (2011) concluded that Facebook and education can indeed be connected.

Despite numerous favourable studies and writings supporting the positive influence and effect of social media in enhancing quality learning and high academic performance of students generally by assisting in collaborative, engaging and interesting modes of learning with the world at their fingertips, there are still some contrasting perspectives on the roles played by social media. Salvation and Adzharuddin (2014) submitted that social media networks have no academic relevance since most of the users use it for socializing purposes. Kirschner and Karpinski (2010) reiterated that college students who use the 500 million member social network have significantly lower grade-point averages (GPAs) than those who do not.

Hamat(2012) concluded that social media network users spend more time for socializing rather than learning. In addition, a study by Kord (2008) found Social Media to have a negative influence on academic performance which he believed was potentially caused by the amount oftime students were spending on social networking websites such as Facebook andTwitter; 2.5 hours per day according to his study. Kord's study also found thatthere was minimal social networking interaction between students and staff.

Jacobsen and Forste (2011), however, indicate that electronic media use is negatively associated with grades. The multitasking nature of social media likely increases distraction and can sometimes be detrimental to students' performance.Hargittai& Hsieh, (2010) in his study found that the use of social media networks is not systematically related to students' academic performance. Lenhart (2010) reported that some schools in the United States, for instance, havetried to minimize cell phone distraction by eliminating cell phoneson schoolproperty or allowing phones and engagement in social media at school

but not in the classroom.In a survey of 102 students, 57% of the participants stated that social media have made them less productive (Kalpidou, Costin& Morris, 2011).

There are various forms of social mediaproduction. Constantinides and Fountain (2007) and Lehtimäki, Salo, Hiltula and Lankine (2009) divided social media into five maincategories based on their application types into : *Blogs and podcasts, social networks,communities, content aggregators, virtual worlds.* Gratton & Gratton (2012) grouped social media networks into six namely: Publishing which includes wiki platforms, lifeblog services and blog engines; Networking like MySpace, LinkedIn and Badoo, Localization which includes Yelp and Plancast; Playing as for innovative editors like Digital Chocolate and Kobojo and dedicated platforms like Hi5. Sharing with examples like Instagram for picture sharing, YouTube and Dailymotion for sharing videos, Slideshare for sharing documents and pinterest for sharing products. The last in the list of Gratton & Gratton (2012) is Buying: with PowerReviews, Boosket, Polyvore and Hunch falling into this group.

Moreover, another important classification is that provided by Kaplan and Haenlein (2009) in which there were two dimensions of systematic classification based on theories in field of media research and social processes, whichare the two key components of social media.As for media component ofvertical classification, Kaplan and Haenlein (2009) proposed that media will differ in the degree of "social presence" and "mediarichness". The higher the social presence, the larger social influence has on eachcommunicator's behaviour, and social presence will be influenced by medium intimacy andimmediacy. Meanwhile, the better quality and amount of information transfer, the moreeffective the media is. Regarding to horizontal dimension of classification, social processeswere discussed by self-presentation and self-disclosure concepts. Self-presentation indicates thedesire to control impressions on other people, while self-disclosure is highly occurs duringconversation between strangers.

Statement of the Problem

Over the years, the use of social media as well as visits to social networking sites have metamorphosed from use as mere platforms for social pleasure and entertaining engagements to learning tools for the 21st century learners and professionals alike. The proliferation, expansion, andgrowth in popularity ofsocial networking sites have become a matter of utmost concern for educators, researchers, moralists, religious leaders, administrators of institutions, information and communication specialists, information management experts, cybercrime security experts and psychologists and sociologists. These wide range of individuals and professionals have bothered greatly as to the beneficial as well as the associated social and security risks undergraduates face in the course of their social media networking. A most significant of such concerns particularly to educators and other stakeholders in the education system is the relevance that these social media networks and online networking sites have to promoting students' academic performance and quality learning. This study therefore investigated the relevance of social media networking in enhancing quality learning among undergraduate students in Nigeria's universities.

Purpose of Study

The purposes of this experiment were:
1. to investigate if the utilization of different social media concepts for learning by undergraduate students in public universities would be lesser than that of their counterparts in private universities.
2. to find out if the extent of utilization of different forms of social media for learning byundergraduate students in both public and private universities.

ResearchHypotheses
1. The utilization of different social media concepts for learningby undergraduate students inpublic universities would be lesser than that of their counterparts in privateuniversities.

There will be a significant difference in undergraduate students' utilizationofdifferent forms of social media networks for learning between public and private universities.

Research Methodology
Research Design

A descriptive research of the survey type was adopted for this study since the researcher intends to obtain information on the relevance of social media in enhancing quality learning among undergraduate students in Nigeria's universities.

Sample and Sample Techniques

A four-stage sampling technique was adopted for this study. Firstly, a purposive random sampling technique was adopted to obtain two universities in Osun state, one being a privately owned university and the other being a public university. These two universities were purposively sampled based on equivalence due to some characteristics they share. For instance, the two universities employed for this research have undergraduate students who fall across the different classes of family background and social status. There are both male and female students in the two universities. The two universities provide internet access to students but at an affordable cost, and they both have facilities like computer laboratories, students' hostels, well equipped library, regular power supply and alternative power supply in case of power outage.

Secondly, a purposive sampling technique was thereafter used to identify a population of students in each stratum with previous semester cumulative grade point not below 2.5 (second class lower division), this was to ensure that the caliber of students in the study sample were not low performers who are academically below average but quality learners.

Thirdly, stratified random sampling was thereafter used in selecting sample size for this study. By implication, the researcher arranged the undergraduate students in each school into strata based on their educational levels namely: 100, 200, 300 and 400 level, and the faculties they belonged to. In order to achieve a higher degree of precision, the researcher based the selection on proportions. That is, the number selected from each stratum was on the basis of the proportion of students in all the strata.

Lastly, after this, the researcher applied the simple random sampling technique to select students from the list in each stratum. About three hundred and thirty five undergraduate students were drawn from all six faculties available in the POU ranging across One hundred to four hundred level, while three hundred undergraduate students were sampled from ten of the thirteen faculties in the PBU ranging across One hundred to four hundred level. The researcher andresearch assistants ensured that all respondents were able to read, write, study, interprete and ask questions, so as to be fit for fit for the experiment.

Research Instruments

To test for the difference in the relevance of social media to undergraduate students learning in the two universities,two researcher-designed rating scales were used namely: University Students' Social Media Concept Utilization Scale (USSMCUS) and University Students' Social Media Form Utilization Scale (USSMFUS). The USSMCUS was made up of a scale containing the two categories of social media concepts from where undergraduate students ticked as appropriate. The USSMFUS on the other hand comprised of 19 items which are all various forms of social media from where undergraduate students picked the ones utilized by them for learning and which has enhanced the learning of concepts within the curriculum designed for their individual course of study. Both instruments have two sections titled A and B. Section A contains personal information about undergraduate students like level, faculty and department. Section B however contains information regarding concepts and forms of social media utilized respectively, while giving a very brief characteristic and few examples of each concept and form of social media in order to guide respondents appropriately.

Validity and Reliability of Research Instruments

Both research instruments USSMCUS and USSMFUS were validated by experts in tests, measurement and evaluation as well as specialists in media networking and their advice put into consideration in the final scales used for the study. To test the reliability of the research instruments, a trial test was carried out involving fifty undergraduate students from a university in Osun state that was different from the ones used for the main study. The instrument was re-administered on the same set of undergraduate students three weeks after. Pearson product moment correlation was used on the data collected. The reliability value for USSMCUS was found to be 0.83 while USSMFUS gave a reliability value of 0.91. Since these reliability coefficients were high and above 0.5, the instruments were thus adjudged appropriate for the purpose for which they were constructed.

Data Analysis and Discussions

Table 1:
Means, Standard deviations and levels of significance for the Concepts of Social Media

Social Media Concepts	Characteristics and Examples	Category	POU	PBU	Level of Significance
High Self-presentation/Self-disclosure	Blogs, Social network sites e.g. Facebook	Mean	180.88	61.25	P< .001
		SD	32.86	15.48	
Low Self-presentation/Self-disclosure	Collaborative projects e.g. Wikipedia, content communities e.g. YouTube.	Mean	63.38	40.50	P<0.001
		SD	10.23	9.58	

One-way multivariate analysis of variance was used to determine statistical significance. The means, standard deviations and levels of significance for the two social processes under which the concepts of social media can be classified are shown in Table 1. Based on the fact that both variables were highly significant at p< 0.001, the data appear to support the hypothesis that theutilization of different social media concepts for learning by undergraduate students in public universities would be lesser than that of their counterparts in private universities.

Table 2:
Means, Standard deviations and Levels of significance for Various Forms of Social Media

Forms of Social Media	Characteristics and Examples	Mean SD	POU	PBU	Level of Significance
Blogs	Blogger, ExpressionEngine, Engadget, LiveJournal, Huffington Post, Open Diary, TypePad, Vox, WordPress, Xanga	Mean	6.00	3.38	P<0.124
		SD	3.63	2.72	
Online Social networking	Facebook, Hi5, LinkedIn, MySpace, Orkut, Tagged, XING, Viadeo, Badoo, ASmallWorld, Cyworld,	Mean	42.13	15.25	P<0.001
		SD	11.96	3.28	
Entertainment Platforms	Cisco Eos Active Worlds, Forterra Systems, Second Life, The Sims Online , Kongregate, Miniclip.	Mean	3.88	2.38	P<0.363
		SD	3.52	2.83	
Wikis	Wikipedia, Wikia, PBworks, Wikihow, Wikitravel, Wetpaint,	Mean	18.63	5.63	P<0.003
		SD	9.67	4.07	

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Wikipedia, Wikia, PBworks, Wikihow, Wikitravel, Wetpaint, Wikimedia.	**Mean** **SD**	**18.63** **9.67**	**5.63** **4.07**	**P<0.003**
Instgram, Flickr, Photobucket, Picasa, deviantArt, SmugMug, Zooomr, UstreamTV	Mean SD	22.88 8.76	6.63 3.20	P<0.001
Foursquare, Gowalla, Facebook places, The Hotlist	Mean SD	5.25 2.77	1.63 1.60	P<0.006
Whatsapp, Telegram, Viber, WeChat,	Mean SD	76.50 13.92	24.75 7.42	P<0.001
Digg, Sladshot, Reddit, MyWeboo, Newsvine,Mixx.	Mean SD	4.75 3.66	1.63 2.62	P<0.069
sevenload, Viddler, Vimeo, YouTube, Dailymotion, Metacafe, Nico Douga, Openfilm, TubeMogul, scribd, SlideShare	Mean SD	10.75 2.38	9.75 2.92	P<0.464
(or social tagging), CiteULike, Delicious, Diigo, Google Reader, StumbleUpon, folkd.	Mean SD	2.38 1.69	1.13 1.36	P<0.0124
FMyLife, Foursquare, Jaiku, Plurk, Posterous, Tumblr, Twitter, ,Path, Qaiku, Yammer, Google Buzz .	Mean SD	17.75 6.04	8.88 3.36	P<0.003
Askville, EHow, Stack Exchange, WikiAnswers, Yahoo! Answers Quora	Mean SD	1.75 1.91	0.75 1.75	P<2.293
Eventful, The Hotlist, Meetup.com, Upcoming.	Mean SD	4.00 1.77	3.25 2.12	P<0.456
Causes, Kickstarter.	Mean SD	1.75 1.67	1.13 1.25	P<0.410
Dropbox, Playdompcap , Google Docs, Docs.com, Zynga.	Mean SD	5.63 3.07	4.38 2.07	P<0.355
Trapster, Waze, StumbleUpon.	Mean SD	3.00 2.51	0.75 1.04	P<0.034
ccMixter, Pandora Radio, Last.fm, ReverbNation.com, Spotify…) ShareTheMusic, The Hype Machine	Mean SD	4.00 2.27	2.38 2.20	P<0.168
Justin.tv, Livestream, OpenCU, Skype, Stickam, Ustream.	Mean SD	8.63 2.50	6.38 3.16	P<0.137
Netvibes, Twine (website).	Mean SD	3.76 3.06	1.75 1.39	P<0.114

The means, standard deviations and levels of significance for the various forms of social media networks categorized along the divide of their common characteristic platform of interaction are shown in Table 2. It was found that only three of nineteen variables were significant at 0.001 level. These were 'Mobile Messaging Application', 'Online Social networking' and 'Photography and art sharing'. Two at the 0.003 level, namely: 'Wikis' and 'Microblogging'. One was also significant at 0.006level namely 'Location-based social networks'. 'Social news' was marginally significant at the 0.069 level.'Social navigation'

was only significant at 0.034 level. However, a tendency for undergraduate students to utilize different forms of social media networks for learning in privately owned universities tobe higher is indicated by the fact that all the means for undergraduate students' utilization of different forms of social media networks for learning in private universities were higher than the means for undergraduate students' utilization of different forms of social media networks for learning in public universities.

Findings

Generally, the data analyzed for this study strongly support the hypothesis that in public universities, there is lesser utilization of different social media concepts for learning by undergraduate students. This implies that undergraduate students in privately owned universities make a better use of different concepts of social media.   This finding had been earlier supported by the works and findings in studies like that of Baruah (2012), Oghenetega and Ejedafiru (2014), Awake (2011), Olasunkanmi (2010) and Raihan, Hasan & Shamim (2013),who stipulated that, online social networks have all components of fostering modern learning by promoting interdependent, personalized learning, learner centered in the process of acquiring knowledge.   On the contrary, the finding of Salvation and Adzharuddin (2014) who submitted that social media networks have no academic relevance since most of the users use it for socializing purposes opposes the finding in the current study. Kirschner and Karpinski (2010) also has a contrasting position to the current finding. Hamat(2012) does not also support the current finding as he concluded that social media network users spend more time for socializing rather than learning.   In addition, a study by Kord (2008) found Social Media to have a negative influence on academic performance. Jacobsen and Forste (2011), however, indicated that electronic media use is negatively associated with grades. All these are opposed to the finding in the current study.

The fact that the three categories showing the most significant differences were:Mobile Messaging Application', 'Online Social networking' and 'Photography and art sharing', can perhaps be explained as a proportional difference. The three were among the most easily accessible social media networks. Since they had higher occurrences, the difference was more significant. The other forms of social media in the less significant categories may be slightly less accessible and less utilized. The same effect may explain the much greater significance of 'Wikis' and 'Microblogging' as compared to many other forms of social media with lesser significance. The finding on these three categories have been earlier supported by Towner and Mun˜oz, (2011) who concluded that Facebook and education can indeed be connected. Griffith and Liyanage (2008) also supported this when he found that instant messaging, wikis, blogs, discussion boards, and other Web 2.0 facilities could provide support which can complement what is taught in a traditional classroom setting.

Although, as a whole, there was a significant difference between the utilization of different social media concepts for learning by undergraduate students in both privately owned and public university, there was not a significant difference between most of the individual forms of social medium. Inadvertent observations of some undergraduate students may offer explanation for this. It was observed that some of the students while accessing social media networks on the internet using their telecommunication gadgets, mobile devices as well as computer desktops and laptops had opened several social media among which they switched at intervals.This might have led to an insignificant difference in the utilization of a particular form of social medium above another by students of the same university. Hargitta and Hsieh, (2010) in their study found that the use of social media networks is not systematically related to students' academic performance.

Other reports that either supports or opposes the finding of this study is that of Lenhart (2010) who reported that some schools in the United States, for instance, have tried to minimize cell phone distraction by eliminating cell phones on school property or allowing phones and engagement in social media at school but not in the classroom. Kalpidou, Costin and Morris (2011) also stated that social media have made students less productive. Barczyk, (2013) believes that the use of social media facilitates interaction and information exchange among learners leading to enhanced performance. Abanikannda (2016)

maintained a dual position. The researcher opposes the finding of this study on one hand by claiming that social media displays study time thereby impending intellectual abilities, on the other hand, his position however that, social networking has been a very important instrument for facilitating academic activities in tertiary institutions in Nigeria is in tandem with the finding of this study.

It was found that the extent of social media network utilization by undergraduate students in public universities for learning was low. In privately owned universities on the other hand, the utilization level of social media network was high.

Conclusions and Recommendation for Further Studies

It can be concluded that undergraduate students in public universities do not utilize social media for learning as much as undergraduate students in privately owned universities. This is most likely as a result of undergraduate students in privately owned universities being at a better economic advantage which has afforded them access to and procurement of electronic devices, telecommunication gadgets, mobile and digital devices, computer desktops and laptops as well as regular data bundles for accessing social media networks.

These results are not necessarily generalizable. There is no reason to believe that these two universities are perculiar in any way that would lead to lack of replication. Other explanations for the results are however likely. First, the schools were not fully equated along family status, social and economic background. Given that PBU has a larger number of undergraduate students with lower class family status and a moderately lower economic background than undergraduate students in POU, one would likely hypothesize results opposite to those found here, however. Secondly, the rating scales were administered to undergraduate students at different times at the two schools. Also, the lecture time table and daily engagement schedule for students may differ between the two universities, thereby giving room for undergraduate students in the two universities to differ in the time available for accessing and navigating through social media networks. Moreover, the study did not employ gender as an independent variable and this probably might have provided useful information. The author is not convinced therefore, that any of the aforementioned could explain the highly significant results. Since there is no evidence here to show that undergraduate students in the two universities had particular interest and affinity for specific forms of social media networks and that this interest led to their extent of utilization, further studies could be conducted in this regard.

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BROADCAST- BASED OPEN AND DISTANCE LEARNING AS PANACEA TO PROBLEMS OF ACCESS TO TERTIARY EDUCATION IN KWARA STATE

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Abstract

Broadcast- based open and Distance learning is not new in Nigeria. It dated back to colonial era when in 1951 the Nigerian broadcasting service started educational broadcasting through diffusion. The radio sets in homes, offices, and listening centres were wired to the radio station. Then subjects taught were based on syllabus of British schools. The importance of educational broadcasting and other related instructional materials led to the government recognition for usage as integral part of ODL in Nigeria Educational System. This paper highlights broadcast media, examines its prevalence in Nigeria, states its advantages related to ODL programmes, considers Kwara State broadcast- based potentials and postulates how best to explore and exploit such as panacea for solving problems of access to Tertiary education in Kwara State.

Introduction

Broadcasting is a primary means by which information, and entertainment are delivered to the public in virtually every nation around the world, it refers to transmission of electromagnetic audio signals (radio) or audio- visual signals (television) that are accessible to a wide population via standard, readily available receivers. Broadcasting is a crucial instrument of modern social and political organization in the 20th century, infact radio and Television (TV) broadcasting has been employed by political leaders to address nations, because of their capacity to reach and influence large numbers of people (NBC 2002). The first public broadcasting of TV- took place in London in 1936. This was by Marconi- Emi and Baird TV. However, the first regular TV Broadcasts began in United states of America (USA) in 1939. After the 2nd world war TV broadcast received a boost and industry witnessed tremendous growth with the introduction of colour TV in New York by Peter Goldmark inc. (Encarta, 2009).

Radio and TV signals evolved more prominently during the exploration of the outer space. This was because broadcast signals were usually sent from transmitters in the space and this led to the invention of satellites with TV cameras. Hence unmanned spacecraft could relay thousands of close-up pictures of the moon's surface to the earth for scientific analysis and preparations for lunar landings. The use of TV cameras in this context led to the development of photo sensitive camera lenses and more sophisticated transmitters that could send images to a quarter of million miles (Encarta, 2009).

With time, the process of watching images on TV screen made people to be interested in either purchasing or watching their own programmes at their leisure, rather than during standard broadcasting time. Hence the programming of videotape in use since 1950's was adopted for use via TV. This led to the emergence of video cassettes recorders (VCRs) in 1970's and by 1980's it became almost as common as TV sets (Encarta, 2009).

Broadcasting technology is a mode of information delivery, electronically transmitted for direct mass, private or public reception. Generally speaking broadcasting involves dissemination of information via audio (sound) radio and audio- visual signals television (TV) which could be received via electronic devices such as radio, TV, film strips, video conferences, video teleconferencing and mobile technologies.Broadcasting according to Flor, (2004) has three functions, to entertain, to inform and to educate. In the realm of entertainment, this is achieved through music, soap operas, and variety shows, whereas information function is exemplified by presentation of news and documentary features.

Characteristically., broadcasting media has a uniqueness which makes it easily discernible from other electronic media because of its ability to distribute its signals to several audiences at the same time. In this regards it makes it possible for presentations on radio TV to be received with a sense of immediate - how it is happening concurrently, at the same time it is unfolding (Adebayo, 2013).In another dimension, broadcast media has universal acceptance and peculiarity. In this regards it breaks the barrier of Literacy and social class. Broadcasting signals do not discriminate on basis of socio- economic or educational background. The potentials of broadcasting make it a veritable and potent tool indispensable for audiences-learners, in their respective localities. (Iwu, & Nzeako, 2010).

The realization of the immense benefits of broadcast media to achieve educational objective led to attempts at using broadcasting facilities for formal educational objectives. In this regard, educational broadcasting is a specific type of educational communication technology which utilizes the broadcast media. It is a systematic use of broadcast technology to enhance or contribute to the learning of an identified audience (Flor,2004).It must be started that educational broadcast is purposively organized to effect changes in the cognitive, psychomotor, and affective domains within the learner, which are supposed to be manifestations of specific behavioural objectives. Educational broadcast otherwise termed instructional broadcast is understood as a general purpose educational concern that is more of using broadcast facilities within the non-formal education, than in the formal institutionalized education sector. This according to Flor, (2004) is because of the needs in the third world in the realm of literacy, health- care, sustainable agriculture, environmental education among others.

Within instructional technology parlance the Narrowcast technologies works on the principle of electronic transmission and reception intended for a specific audience, at times limited to an individual. It is not intended for reception of the general public, since it often requires decoders or other devices to convert signals for the use of specific subscribers. This involves cable TV, two way band radios, teleconferencing, commercial satellites, and computer networks. (Erdman,1981).The above classification is imperative, as narrowcast technologies have been used, is being used, and will continue to be used for educational purposes. It is worthy to note that instructional broadcast could be used for direct teaching programmes- taken over the functions of a teacher or the lecturer, and for enrichment programme aimed to supplement the course rather than present the course itself.

Broadcasting in Nigeria

Broadcast media was introduced to Nigeria with the establishment of Western Nigerian TV & Radio station at Ibadan on 31st October, 1959. This was followed with the inauguration of similar body Eastern Nigeria TV, at Enugu in 1960, and Northern Nigeria broadcasting corporation in 1962. (Iwu & Nzeako, 2010). By decree 24, of April 1976, the Federal Government established the Nigeria television Authority (NTA) with powers to take over all existing TV stations in the country as well as plan to establish new stations in state capitals without TV- Stations. However, between 1979-1983, many state governments established their own TV & radio stations (Dike, 1989).

In August 1992, the Federal military government promulgated the National broadcasting commission decree No.38, (now reformed to as Act No. 38) deregulating the broadcasting industry and establishing the National Broadcasting commission to regulate the entire industry. (The code, 1999).   In Nigeria as today, there exists National, State and private radio & Tv stations. According to NBC (2012), there are eight National radio stations, over forty state owned Radio stations, more than one hundred private radio stations and twenty- seven campus radio stations. For TV stations, there are more than fifteen NTA stations scattered in the 36 states of the federation and the Federal capital territory, over thirty state TV stations and many private TV station. However, there is no campus TV or community TV stations despite NBC provisions for such establishment. (NBC,2012.)

In Nigeria, the realization of the immense benefits of broadcasting media to achieve educational objectives have led to many attempts at utilizing its facilities for formal educational objectives. such broadcasts had been on school lessons on civics, religions, Agriculture, Health, French, English, mathematic etc. in this regards, Yusuf ((2002) observed that broadcasts does not cover deep subject contents, but only serves to improve or enhance subject areas learnt, and effectiveness is left to chance.Within the Nigerian milieu, in the case of the radio, we have the Open radio broadcast through the commercial and public radio stations; Yusuf (2002) asserts that educational broadcasts through the radio are

Also in the broadcast media in Nigeria, all radio and TV stations broadcast formal school lessons, on such subjects as civics, Religions, agriculture, health, French, English, mathematics etc. this however does not cover deep subject contents, but serves to improve subject areas learnt, and effectiveness is left to chance. (Yusuf, 2002).In view of the highlighted background of broadcast media in Nigeria, it is considered that if we explore and exploit, it will solve very salient problems that are inherent in the Nigerian school system. Among the such problems are the poor state of affair not unconnected with dearth of qualified personnel, inadequate laboratory and workshop equipment for sciences, inadequate instructional materials, increase in students population without increase in resources- human and material, insufficient infrastructural facilities, inadequate facilities at all levels of education, coupled with ineffective teaching. (Agun, 1988).

Open and Distance Education in Nigeria

The pursuits and provision of efficient educational system based on functional approach is often seen as a way of accelerating social, scientific, political and technological progress of any nation. In line with this governments the world over have put in place or adopted various systems and mechanisms to achieve functional literacy. Such system and mechanisms include the incorporation and use of information and communication technology (ICT) in the school curricular and the adoption of Educational for all (EFA) strategies.

In adopting the EFA Strategies, it is noted that provisions of formal education has a lot of constraints, which hinders the realization of EFA goals. Such hindrances are in the realm of inadequate infrastructural facilities, poor maintenance/ expansion of crucial facilities, incessant strikes by academic /non- academics, admission problems: quota system/ catchment area syndrome, leading to admissions of less than 20% of qualified candidates for tertiary institutions between 2007-2011 (Jamb. 2012).The highlighted constraints make higher education "closed" to majority of qualified candidates, therefore, the need to "open" it up, in term of access, affordability, time, space- without geographical limitation (Jegede, 2004).

It is in view of the above developments, the Nigerian government recognizing the concept of open and distance learning to be all- inclusive contact, no contact, and part time education (FRM 2004), 'Open' as a composite of ODL is explained by UNESCO (2002) to relate to policies as open admissions, freedom of selection of what, when, and where to learn, helping learners to exercise their freedom of choice over one or more of the main purpose of learning- learner based approach. Also, openness attends to the flexibility of organizational structures, delivery and communication patterns coupled with the use of various technologies.

Highlighting further on the open concept, Jegede (2010) said it implies allowing students to dictate every step of their studies, what to study, when to study, how to study, how many course to study at one time or semester, when ready for examinations, and when to graduate. This Jegede (2010) started is a panacea that avails all people(and not just the privileged elite) to have equal access to education.

In the realm of distance learning historical antecedents of it has four stages. The first was the correspondence system that began at the end of the 19th century. The second phase was the era of usage of multi- media- print media, tape, video- tape, and at times with elements of face- to- face interaction to support delivery. The third phase is the tele- learning model which started in 1950's- 1980's. This involved the use of various delivery technologies- terrestrial, satellite, audio-video

conferencing, audio-graphic, communication, TV & radio broadcasting and audio- teleconferencing. These are used to deliver live or recorded lectures to both individual home based learners and groups of learners in remote classrooms where face-to-face support might be provided. (Ganiyu, Ismail & Blessing, 2010).

The last stage evolved in 1990's till present day, this involves the use of flexible learning via internet based systems in which multi- media based text, audio, video, and computer based- materials in electronic format are delivered to individuals through computers, along with access to databases and electronic libraries (UNESCO, 2002).

Advantages of ODL

ODL according to Jegede (2006) has the following advantages:
(a) Accessibility: Students may enroll and start at any time of the year.
(b) Time: Students can study at any time to suit themselves and their circumstances.
(c) Locale: In term of location, learning courses are delivered to/ or transported to the students at their locale, where it is considered convenient, at home, at work, or elsewhere.
(d) pace: students can work at a pace appropriate to their ability and achievement.
(e) Cost effectiveness: as a result of multi-media application, the number of learners involved in ODL makes it's cost effective and affordable.
(f) Openness of ODL breaks access to education, disregards age limit, bridges geographical separation, and gives room for flexibility as per methods and modes of instruction. (p, 32).
Other benefits of Broadcast based media are:

a) It could be used to reinforce conventional teaching, which can solve problems not solved by conventional teaching such as in the case of mass education. (Lefranc 1983 & Geoffrey 1990).
b) Broadcast media has inherent qualities which both direct and indirect significance influence on the quality of instruction, which enhances teaching and effective learning.
c) It makes teaching and learning livelier, more concrete, more efficient and more effective.
d) It presents information in all forms of spoken words, dialogue, discussions inter- commentary and in dramatized forms.
e) Technical devices could be used to reveal the natural world in a more comprehensive way through direct teaching.
f) It enables the teachers to use the TV, and video media with varieties of resources like films, graphics, radiography, micrograph, photography, etc in teaching and learning situations (Armsey & Dahl. 1973).

Broadcast- based ODL as effective Tool for ODL in Kwara State

Kwara State which was created out of the Old Northern Nigeria in 1967, has an array of broadcast based technological tools that are available for ODL programme potentials are evident with the presence of the followings:

Radio Stations: There are six radio stations in Kwara State, they are Radio Nigeria Idofian, Radio Kwara, Radio Kwara FM, Royal FM, Royal Fm Radio, Okin radio and UnilorinFm Radio. Reception of radio signals is available at every nook and corner of the state; Moreso, radio broadcast is very common, gives current, life accounts and programmes of activities of public and private institutions. Also radio sets are cheap to acquire, and almost all persons literate and illiterate can operate. Thus in most homes, offices and even in rural settings radio sets are common features, dishing out news, documentaries and serving as interactive forums for the populace. Because of the highlighted potentials stated, ODL programmes can be easily transmitted through the use of radio to disseminate information, counseling, and to facilitate academic courses at specific hours. Since radio broadcast can be received even in remote areas.

Television Stations:- within Kwara state there are two TV stations namely: Nigeria Television Authority (NTA) fate Ilorin, and Kwara television, Apata- Yakuba, Ilorin. However, there exists a good number of cable- satellite TV networks, and reception of various TV channels is with ease within the state. TV medium can be used to disseminate information to learners inform of live broadcast- whereby educational events are directly telecast, or record broadcast- where such pre- recorded programmes are telecast per transmission scheduled for convenience of the producers and the learners.

Teleconferencing: This involves the facilities that allow many people to be simultaneously connected so that discussion/ lectures can take place even though the participants- learners/ lecturers do not meet face- to lecturers   face. It is mostly useful in ODL programmes where students and lecturers are widely dispersed, and separated due to geographical location. In Kwara state with the presence of various telecommunication networks, and computer related organizations, government(s) could collaborate to provide teleconferencing facilities for ODL programmes at Tertiary Education Level. This will solve so many problems related to transport, logistic barriers, geographical locations, funding, and other occupational hazards.

Conclusion

It is observed that the entertainment function, and the information function of radio broadcast seems to overshow the educative teaching and learning function. This Flor (2004) asserted is because advertisers pay little if at all to sponsor educational programmes in broadcast. Such ventures are said to be mostly financed by Government. But the question to ask is this – Has Kwara State Government sponsored broadcast- based tertiary Educational programmes on ODL basis?
Broadcast based ODL is now a widespread world- wide phenomenon, not only applicable to open Universities, but also to all educational sectors. The Federal government of Nigera has approved of the integration of Radio and TV, broadcast to form a major education support service and that in service- education courses for the up-grading of teachers shall be linked to educational radio and TV broadcast (FRN, 2004). Although the constraints are many, yet they are not insurmountable. With government collaborative supports from well meaning educational stakeholders in Kwara State, broadcast- based ODL could help to solve most problems related to access of tertiary education in kwara State.

The broadcast media in vogue in Nigeria has good potentials to solve pertinent educational problems if well exploited. This assertion is buttressed by the acknowledgement of federal governments' enormous investment at establishing a dedicated TV Educational TV. Station, at NTA Tejuoso in Lagos. (Jegede , 2002). The onus now rests on the proper implementation of this noble gesture and necessary orientation which should be given to teachers at all levels of Nigeria school system as to appreciate the worth of the broadcast media.

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COMPARATIVE STUDY OF THE EFFECTS OF COMPUTER ASSISTED INSTRUCTION ON STUDENTS' ACADEMIC ACHIEVEMENT IN SCIENCE SUBJECTS IN HIGH SCHOOLS IN OSUN STATE, NIGERIA

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Abstract

In recent years, Information and Communication Technology (ICT) has been growing quickly and seems to become an integral of individual life. Since the dawn of the twenty first century, technology has crept into learning and teaching environment. With the growing rate, the education framework has to be improved and ICT be coordinated into school activities. This may be the thought of the State of Osun in introducing computer into senior high schools to assist delivery of instructions. However, the effect of this introduction on students' performance has to be considered. Therefore, this study investigated the effects of Computer Assisted Instruction (CAI) in science subjects (Biology, Chemistry and Physics) on senior school students' academic achievement. One school in each senatorial district initially supplied with computer tablets by Osun state government before other schools were purposively selected for the study and an intact science class was randomly selected from each. 152 students participated in the study. One group pretest-posttest experimental design was used for the study. Students' examination scores served as instruments. The examination questions were validated and the reliability stood at $r = 0.82$. Data collected was analysed using descriptive and inferential statistics. Results showed difference between the mode of instruction and students' achievement in each of the subjects. The difference was highest in biology; physics and chemistry trail behind respectively. Recommendation is that instructions should be assisted with computer in teaching science subjects. However, for better outcome in chemistry, more effort should be incorporated in the use of CAI.

Keywords: Computer Assisted Instruction, Science Subjects, High Schools, Students' Achievement

Introduction

Since ancient times, various techniques have been devised for communicating thoughts, needs, desires, etc among human beings. Communication being an integral part of everyday life of an individual has span through the entire world. Today, in this civilized dispensation of the twenty-first century, the communication system has advanced to carrying voice, text, pictures and many other types of information with the advent of Information and Communication Technology (ICT). ICT according to Adomi and Kpanghan (2010) are electronic technologies used for information storage and retrieval. Asli, Berrado, Sendide and Darhmaoui (2015) refer ICT to a large field that includes radio and television, as well as newer digital technologies such as computers and internet. The rapid rate at which ICT is growing has led to globalization and the world becoming a global village. The recent advances of ICT have led computers to become recognized and widely available to many people. According to Adomi and Kpanghan (2010), ICT has a significant impact on all areas of human activity. It has found its use in every area of human endeavour. With communication being an integral part of education, the education system is not left out of the ICT move. When used appropriately, different ICTs are reported to foster access to education, strengthen the relevance of education to the increasing digital workplace and raise educational quality by teaching and learning in an engaging, active process connected to real life. The use of ICT is fast gaining prominence and becoming one of the important elements of defining the basic competence of students. The ICT breakthrough has made a landmark in globalizing education. Agari and Singh (2013) submit that the use of ICT in teaching is a relevant and functional way of providing education that will assist in imbibing in the learners the required capacity for the whole word of work. Information and Communication Technology has entered the classroom in a big way and become part of the teaching and learning process.

The ICT in education has been shown to be important improved access to learning by all, creation of conducive learning environment, quality of knowledge delivery, expanded secondary and post-secondary education, reduction of expenditure on training among others (Ogunleye, 2007). It is now evident that the integration of ICT in teaching is central towards quality education. Supporting the accession, Adomi and Kpanghan (2010) remarked that ICT has undoubtedly affected teaching and learning.

In a rapidly changing world, basic education is important for an individual to be able to access and apply information. This ability is found in ICT usage. Also bearing in mind the submission of Economic Commission for Africa that the ability to access and use information is no longer a luxury but a necessity for the development of a nation (Adomi and Kpanghan, 2010), there is great need for integration of ICT in classroom for teaching and learning especially in sciences in developing countries like Nigeria where there is low ICT application in classrooms.Science is the basis for scientific and technological development of any country. The growth of any nation is a measure of its advancement in science. Fakorede (1999) remarked that any country that hope to develop must not neglect science hence, science is taught in all schools in Nigeria. Science is taught at Senior Secondary School (SSS) level as Biology, Chemistry and Physics. At this level, the teaching is not just concerned with knowledge of the subjects but more particularly with scientific method and the effect of the use of this method on individual student. Therefore, the teaching of sciences at SSS attempts to develop both manipulative and mental activities. The overall objective of science curriculum in SSS include application of students' scientific and technological knowledge and skills to meet social needs as well as take advantage of numerous career opportunities offered by science and technology. In view of this, it shows that there is a relevance of technology to science curriculum. Therefore, the use of ICT in science teaching and learning in classroom may be an expansion in the pedagogical resources available.

Though the use of ICT in science classroom cannot replace normal classroom teaching, Al-Alwani, (2005) remarked that ICTs could be positive forces in science classrooms for deeper understanding of principles and concepts for better outcomes or achievements. Also, Agrahari and Singh, (2013) remarked that ICT integration in classroom may compliment a teacher's existing pedagogy and have positive effects on students' academic achievement. ICTs have been reportedly use for simulations and modeling in science and mathematics and have been shown to be effective in the development of students' language and communication as it has word processing and communication software.

Inspite of the entrant and effect of ICT in the field of education and its relevance to science teaching and learning, Adomi and Kpanghan (2010) reported that its application in Senior Secondary School is still low. Most teachers according Ogunleye, (2007), Ndudi and Chinedu,(2016) are not prepared to use ICT and the majority of the existing school buildings are not equipped to integrate the new ICT especially in public Senior Secondary Schools.

Objective of the Study

The study examined difference in the achievement of students when taught biology, chemistry and physics with and without students' computer tablets and to compare the difference (s) if any occurred in students' achievements in biology, chemistry and physic without and with students' computer tablets.

Hypotheses

1. There is no significant main effect of treatment on students' achievement in:Biology; Chemistry and; Physics

2. There is no significant interaction among the science subjects of physics, chemistry and Biology

Statement of the Problem

In this twenty first century, the use of ICT is fast gaining prominence in every aspect of individual life. Its application and integration has made the world to become a global village. The education system is also not left out this growth. But the execution of ICT is still low. Its integration and application in classrooms is still very low especially in government schools. This may be the careful thought of the State Government of Osun in the supply of computer tablet to individual student of Senior Secondary School Two in the state. In few secondary schools where ICTs have been integrated, one puzzling question is the effective impact of these technologies on students' achievement. The impacts of its usage on the students have not been considered by the suppliers who are the government. Therefore, this study considered the effects of the supply of computer tablets to SSS II students for teaching and learning on academic achievement in science subjects.

Methodology

The research design adopted for the study is a pretest-posttest quasi-experimental design. Multi-stage sampling techniques were adopted. Firstly, purposive sampling procedure was adopted to obtain three secondary schools from three senatorial district of Osun State. The three schools and the senatorial districts are Iwo Baptist High School (IBHS), Iwo from Osun West, Ataoja School of Science(ASS), Osogbo from Osun Central and Ilesha, Grammar School (IGS), Ilesha from Osun East. These schools were sampled based on the fact that they were the first of set of school given the tablet and all senior secondary school II students were given. The three schools were randomly assigned to experimental group I (IBHS), experimental group II (ASS) and experimental group III (IGS) respectively. Achievement Test (AT) was used as a test instrument, while Opon-Imo was used as a treatment instrument. Three science subjects were taught in the cause of the study. The science subjects are Physics, Chemistry and Biology. The test instrument used in collecting data for the study was researchers adopted Physics, Chemistry and Biology Achievement Test. The achievement test consists of 60 multiple choice objective items with five options (A–E) adopted from past examinations of West African Examination Council (WAEC, May/June) and National Examination Council (NECO, June/July) for Physics, Chemistry and Biology Achievement Test.

Treatment instrument (Opon-Imo) was used for the three schools. The topics in the curriculum for Nigeria Senior Secondary School II (Physics, Chemistry and Biology) were taught using the treatment instrument. To test for the hypotheses, the data were analysed using a two-way Analysis of Variance (ANOVA) or two factor Analysis of Variance (ANOVA) using Statistical Package for Social Sciences (SPSS) version 20 at 0.05 alpha level. The results are presented based on the research hypotheses.

Experimental Procedure

The objectives and the modalities for the experiments were explained to the subject teachers in the three schools before the commencement of the treatment. Physics, Chemistry and Biology content as installed in the tablet given to the learners caters for each of the units. A group of students were taught with conventional method in the schools and the Achievement Test was administered on the sampled students

ascertain the equivalence of the students. Another group of students were taught using the treatment (Opon-Imo) instrument on the three subjects. 10 weeks was used for the experiment. Immediately after 10 weeks of treatment, Achievement Tests were administered to measure the achievement of different groups in different subjects.

Result

To test for the hypotheses, the data were analysed using a two factor Analysis of Variance Analysis of Variance (ANOVA) using Statistical Package for Social Sciences (SPSS) version 20 at 0.05 alpha level. The results are presented based on the research hypotheses.

Table 1:

Tests of Within-Subjects Effects for Physics, Chemistry and Biology

Source		SS	df	MS	F	Sig.	Partial Eta Squared
Factor	Sphericity Assumed	18083.027	1	18083.027	103.228	.000	.186
	Greenhouse-Geisser	18083.027	1.000	18083.027	103.228	.000	.186
	Huynh-Feldt	18083.027	1.000	18083.027	103.228	.000	.186
	Lower-bound	18083.027	1.000	18083.027	103.228	.000	.186
factor* Science Subjects	Sphericity Assumed	19766.851	2	9883.425	56.420	.000	.199
	Greenhouse-Geisser	19766.851	2.000	9883.425	56.420	.000	.199
	Huynh-Feldt	19766.851	2.000	9883.425	56.420	.000	.199
	Lower-bound	19766.851	2.000	9883.425	56.420	.000	.199
Error(factor)	Sphericity Assumed	79354.622	453	175.176			
	Greenhouse-Geisser	79354.622	453.000	175.176			
	Huynh-Feldt	79354.622	453.000	175.176			
	Lower-bound	79354.622	453.000	175.176			

Using the Sphericity Assumed, the table revealed that there was a significant main effect of Opon Imo on the performance of senior secondary II students' performance in Physics, Chemistry and Biology with (F (1, 38) = 103.22, p =.00, ηp2<.186). More so, the study revealed that there was a significant interaction among the science subjects of physics, chemistry and Biology when taught using Opon-Imo with (F (1, 38) = 56.42, p =.00, ηp2<.199). This indicates that the use of Opon-Imo to teach the science subjects enhances students' performance.

Table 2:

Test of Between Subject Effects for Physics, Chemistry and Biology

Source	SS	df	MS	F	Sig.	Partial Eta Squared
Intercept	947449.584	1	947449.584	5170.866	.000	.919
treatment	21697.197	2	10848.599	59.208	.000	.207
Error	83002.469	453	183.228			

Table 2 revealed that (F (1, 453) = 59.21, p =.00, ηp2<.21)., Sig. 0.00 which is less than 0.05 is significant because the probability of 0.00 is lower than alpha value (α = 0.05) for the students performance in the three science subjects. Therefore, the null hypothesis is rejected. It implies that there was a significant main effect of Opon Imo on the performance of senior secondary II students' performance in Physics, Chemistry and Biology.

Table 3:

Mean Difference of Students in Physics, Chemistry and Biology

Group	Tr Treatment	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Biology	Conventional	52.513	1.426	49.710	55.316
	Opon-Imo	57.046	1.237	54.616	59.476
Chemistry	Conventional	38.000	1.426	35.197	40.803
	Opon-Imo	38.336	1.237	35.905	40.766
Physics	Conventional	32.875	1.426	30.072	35.678
	Opon-Imo	54.724	1.237	52.294	57.154

The table above revealed that students perform better in Biology with a mean of 52.51 for the conventional group and a mean of 57.05 for the treatment group revealing a mean gain of 4.54. Also Chemistry has a mean score of 38.00 for the conventional group and a mean score of 38.34 for treatment group revealing a mean gain of 0.34 while Physics has a mean score of 32.88 for the conventional group and a mean score of 54.72 for the treatment group revealing a mean gain of 21.84. This indicates that students perform better in the science subjects (physics, Biology and Chemistry) using the Opon-Imo as the treatment.

Figure 1: Group Treatment

From the way the line slopes it was observed that participants in performed well in the respective science subjects but much better for Physics group, followed by the Biology group and then the Chemistry group. The slope of the lines shows that the vertical distance between the dots for each group. Based on this, the group performance was shown as each group performed better when exposed to treatment.

Table 4:
Scheffe's Post Hoc Test for the Performance of Students in Different Science Subjects

(I) grouip	(J) grouip	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
biology	chemistry	16.6118[*]	1.55271	.000	12.9607	20.2629[*]
	physics	10.9803[*]	1.55271	.000	7.3292	14.6314[*]
chemistry	biology	-16.6118[*]	1.55271	.000	-20.2629	-12.9607[*]
	physics	-5.6316[*]	1.55271	.001	-9.2827	-1.9805[*]
physics	biology	-10.9803[*]	1.55271	.000	-14.6314	-7.3292[*]
	chemistry	5.6316[*]	1.55271	.001	1.9805	9.2827[*]

*. The mean difference is significant at the 0.05 level.

The Scheffe's post hoc test revealed that there is significant difference in performance of students in the three science subjects (physics, Biology and Chemistry). From Table 5, the direction of the significant difference in students' performance in the three science subjects of physics, Biology and Chemistry at 0.05 significant level of alpha ($\alpha = 0.05$).

Discussion and Conclusion

The study revealed that there was a significant main effect of treatment on students' achievement in the science subjects of Biology, Chemistry and Physics. More so, there was a significant interaction among the science subjects of physics, chemistry and Biology. This is in line with the report of Shih (2005). Shih was of the opinion that the adoption of mobile devices for instructional delivery purpose is essential and also helpful to students learning. The report of Goodwin (2012) also support the finding of this study that effective learning using mobile device brings learner's creativity, collaborative, communicative and critical engagement. And it promotes effective learning. The report of Promoting and Supporting the Integration of ICT in Education (2017) revealed that students adapt quickly to new technologies and tablets are seen as attractive learning tools by students and have the potential to introduce more engagement and fun into learning as they increasingly have access to tablets and smartphones outside of school, and so can adapt easily to their use in school which is one of the factors that really affects the perform of students when exposed to the use of the Opon-Imo for learning the science subjects.

Based on the findings, it was revealed that students perform better when exposed to the use of the Opon-Imo for learning Science subjects. Also interaction exists in students learning of different science subjects because the textbook are on the same platform where students can easily relate situation to learning.

Recommendation

Based on the findings of the study, this study recommends that other state may key into the idea as it may help students to learn practical oriented science subjects, teachers should be trained continuously as facilitators so as to assist the students learning.

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PRE-SERVICE TEACHERS' AWARENESS OF THE USE OF SOCIAL MEDIA FOR LEARNING IN KWARA STATE, NIGERIA

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Abstract

This study investigated the awareness and use of social media by students in Colleges of Education (COE) in Ilorin, Kwara State, Nigeria. The study was a descriptive research of the survey type. 200 students from the institutions responded to the questionnaire designed to elicit responses regarding the purposes of the study. Frequency count, percentage and t-test were used to analyze the data. The results indicated that colleges of education students were aware of and use social media for learning. Also, colleges of education students interact with and assimilated faster when using Social Media and this influences colleges of education students learning style. There was no significant difference in the awareness of colleges of education students based on gender and also, gender does not influence colleges of education students' use of social media. The study concluded that COE students in Ilorin have ample awareness about the use of social media for learning and that the lecturers' role would be to guide the application to learning. It was recommended that the use of social media in teaching and learning in Colleges of Education be encouraged and adequately monitored to avoid abuse.

Keywords: Awareness, Use, Social Media, Students, Colleges of Education, ICT

\Introduction

Information and communication technology (ICT) has the potential to transform teaching and learning processes. Hence, the United Nations Educational Scientific and Cultural Organization (UNESCO) released a guide to measure Information and Communication Technologies (ICT) in Education especially as it concerns teachers in training- the preservice teachers. This guide put in place a common set of standardized internationally agreed indicators on ICT in education including a number related to teachers' professional development and usage, which are drawn from administrative sources. This guide emphasized the need for preservice teachers to be savvy in the use of ICT for their lessons and personal development.

The use of information Communication technology (ICT) is not strange to the average Nigerian students especially those in higher institutions like the colleges of education; the issue is how much of ICT is utilized in Nigerian learning institutions. The world is experiencing a wave of social and technological transformation as the society is becoming more oriented to the usage of ICT most especially with the ubiquitous nature of the internet, mobile phones and social media. The interactivity feature of the social media that enables its users to freely communicate endears its use to young adults from all walks of life including those in the colleges of Education. Today, we live in a society in which instantaneous worldwide communication through social media and internet have become common.

Social media emerged as a term frequently used to describe different types of electronic communication platforms. The availability of high speed internet broadband connection with massive use of desktop computers, laptops, e-readers, tablets and smart phones enable millions of individuals to actively engage in social networking, text messaging, blogging, content sharing, online learning. Wei and Yu (2011) defined social media as the relationship that exist between networks of people. Social media are technologies that facilitate collaboration, make possible social interaction and enable deliberation across

stakeholders (Bryer & Zavatarro 2011). Kanelechi, Yonlonfoun and Omotere (2014) asserted that social media is primarily internet and mobile-based tools for sharing and discussing information by users.

Social media according to Andreas and Michael (2010:61) refers to "a group of internet-based application that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content". Social media is a platform which enables individuals to connect, create account profile, share files and interact with other users on the same platform. In the same light, Kanelechi, Yonlonfoun and Omotere (2014) regarded social media as comprising online applications primarily developed to foster user-centered social interaction. Social media could be regarded as an online platform which allows for interaction and sharing of text, picture, chart, audio and video between two persons or a group of people irrespective of their geographical location, educational background, age, sex, family background and marital status.

Kanelechi, Yonlonfoun and Omotere (2014) categorized social media into eight areas that are inter-dependent by their mode of usage. The areas of categorization and their uses includes: Social Bookmarking and Sharing Tools allow users to save and share citation of academic papers amongst researchers; Social Networking Sites (SNS) allows for connection of people with friends and others who work, study and live around them and even in other country; Blogging and Micro-blogging Tools allow users to post multimedia and other content to a short-form blog; presentation Sharing Tools allows for sharing of information in PowerPoint, keynote, PDF, open office, and so on; Virtual World is a platform where users can socialize, connect and create virtual environment using free voice and text chat; Audio and Video Sharing Tools allow users to view and share pictures and videos with friends; Research and Writing Collaboration Tools allows for capturing of knowledge, sharing of files and managing projects within a secure, reliable virtual environment; and Project management, Meeting and Collaboration Tools allow users to communicate with peers by voice using a microphone, video by using a webcam, and instant messaging over the internet for the purpose of delivering high-quality learning experience to remote students.

The social media served as means of communication among the undergraduate students all over the world due to the features that they have. The social media forms the major means of the undergraduate communication irrespective of their sex, age, tribe, state of origin, nationality, and so on. Students in colleges of educations find social media easily accessible, efficient, cost effective and user friendly and as a result of very high patronage of the available social media sites, so many other social media sites have been designed and developed such that they would serve the needs of the students while some others have been redesigned, redeveloped and incorporated with new functions and features to meet up with the present day requirements.

These features make easy for the viewing and sharing (sending) of text, pictures, videos, audios, audio-visuals, live chat calls, project materials, research materials and lots more. As a result of the features of social media sites almost all students tend to spend more time on them than their academic works. Ellison, Steinfield, and Lampe (2007) reported that as many as 94% of undergraduates in the United States were users of Facebook. Social media have wide spread among the undergraduate students all over the world and also the amount of time they spend on the social media site is on the increase. *Glass, Prichard, Lafortune, and Schwab* (2013) reported that on the average, Facebook users in the aggregate spend nothing less than 10.5 billion minutes per day on their personal computers logged on to Facebook during January 2012; aggregate minute increased to 57% and average minutes per user per day increased by 14% in January 2012 as compared to January 2011.

Due to the numerous needs of the social media such as to communicate between and among people, surfing the internet for important e-materials, the need for making online business, and so on., the importance and use of social media to the undergraduates cannot be underestimated as it has gone a long way to add negatively or positively to the pre-service academics and moral lives. However, social media

is students' primary means of communication and source of getting materials. It was established that a larger percentage of the respondents use social media for the academic works while few use it for making friends .

Recent surveys have revealed that a growing number of young adults including students of higher institutions often referred to as digital natives (those born between 1990 till date) consumed approximately 9 hours of social media per day with most of them using social network sites (SNS) with Blogging and Microblogging tools (Rosen, 2011, Cabral, 2011). These students are heavily involved in computer games, email, the Internet, cell phones and instant messaging as parts of their lives (Prensky 2001). To Prensky, this group of students functions best when networked. They prefer games to "serious" work and even consume more time on social media particularly on chatting platforms such as Facebook Chat, 2GO and Google Chat than they do with their friends Face-to-Face. These generation of students enjoy spending more time on the social media than academic works.

In the same light, Sanusi, Adelabu and Okunade (2014) reported that most of the undergraduates running full time programmes in Nigerian universities spend more time on social media than any other activity of the day, including academic work. Their report revealed that a large percentage of young people check their Facebook Status when they wake up in the morning even before going to the bathroom. This level of undergraduate addiction to the social media could it split students' attention, divide their interest and thereby cause massive decrease in their academic commitment which leads to poor performance (Junco & Cotton 2012).

On the other hand, Caraher and Braselman (2010) revealed that students used social media to connect with classmates, to work on assignments and, to some extent, to connect with faculty. Social media is useful for learners' interactions, which fulfils different cooperative/collaborative purposes, by enabling them to see receiver's reactions and get the results right away. A number of factors have contributed to the rapid growth of social media. These include technological factors such as increased broadband availability, the improvement of software tools, and the development of more powerful computers and mobile devices; social factors such as rapid uptake of social media by younger age groups; and economic factors such as increasing affordability of computers and software, and growing commercial interest in social media sites (Organization for Economic Co-operation and Development OECD, 2005).

Social media, if properly integrated within the education system, is set to have great impacts on education and the way learners communicate, collaborate, construct their knowledge, and shape their understanding of the world around them. However, for social media to be relevant in education, it is essential for teachers to focus on the pedagogy behind their use and to create and design exciting and meaningful learning in a creative and nurturing context (Kember, 2008). According to Ayannuga et al (2012), social media can lead to innovations in four different dimensions. Firstly, social media allow learners to access vast variety of (often freely available) learning content, which supports learning and professional development in a lifelong learning continuum; contributes to equity and inclusion and puts pressure on Education and training Institutions to improve the quality and availability of their material.

Secondly, Social media allow users to create digital content themselves and publish it online, giving rise to a huge resource of user-generated content from which learners and teachers can mutually benefit, also encouraging more active and pro-active approaches to learning. Thirdly, Social media connect learners with one another, and to experts and teachers, allowing them to tap into the tacit knowledge of their peers and have access to highly specific and targeted knowledge in a given field of interest. Fourthly, Social media support collaboration between learners and teachers on a given project or a joint topic of interest, pooling resources and gathering the expertise and potential of a group of people committed to a common objective (Ayannuga et al, 2012).

Statement of the Problem

Kord (2013) posited that 80% to 90% of students are actively involved with at least one particular social media or the other. Considering the level of addiction of social media by the students, it was reported that most students no longer do the right things at the right time even though they know what to do at the right time. For example, students do not switch off mobile phones, shutdown laptops and palm tops, while class is in progress. Some students log on to these social network sites to soundlessly chat with their friends, check for current notification on their homepage in the course of a formal lecture and also during their private studies. This has negatively influenced the learning of such undergraduates in one way.

If properly utilized for learning, Social media could be a powerful tool that could improve learners' performance in their academics. Buzetto-More (2012) carried out a research on social networking in preservice teachers in universities, and it was found out that the use of social networking services in education benefit education in many ways by supporting students centered learning, authentic instruction, constructivist teaching practices and as well as supporting social learning. Filiz and Funda (2011) also worked on the use of social networks as an educational tool and social media and retention and found out that due to the flexibility user friendliness of social networks, academicians are provided with opportunities as they are used more easily than other educational management systems.

Research Questions

The following research questions were raised to guide the study:

1. Are colleges of education students aware of the use of Social Media for learning?
2. Does the use of social media influence colleges of education students' learning based on gender?

Research Hypothesis

The following hypothesis was tested in the study at .05 level of significance

H_{O1}:   There is no significant difference in the use of social media for learning by COE students based on gender.

Methodology

A descriptive research of the survey type was used for this study. The target population for the study comprise of all students in selected colleges of education in Ilorin, Kwara State. However, 200 students were selected randomly from 3 Colleges of Education in Ilorin, Kwara State. A researcher designed questionnaire validated by educational technology experts from the university of Ilorin was utilized as instrument of data gathering for the study.

Findings and Discussions

Table 1 shows the preservice teachers in colleges of education students awareness on the use of Social Media for learning. The analysis shows that generally preservice teachers in Kwara state colleges of education were aware of the educational values of social media and the ways they could utilize it for learning

Table 1*:*
College of Education Students Awareness of Use of Social Media for Learning

S. No.	Questionnaire Items	Mean
1	Social media is useful for collaborating with my colleagues to get assignments done	3.5
2	Useful information regarding lectures and test schedules are easily circulated to class members on social media	3.8
3	Those considered to be introverts could talk freely in group discussions when on social media	2.4
4	Misconceptions about a topic in a course are quickly cleared when discussed on social media	3.0
5	Aside from connecting and chatting with my friends, social media does not serve any other purpose	1.8
6	Course materials and handouts are easily shared among colleagues through social media platforms	3.6
7	I can trust any information I receive on social media about my class as genuine	2.8
	Grand Mean	2.98

Preservice teachers in Kwara State Colleges of Education were aware that: Social media is useful for collaborating with my colleagues to get assignments done; Useful information regarding lectures and test schedules are easily circulated to class members on social media and; that Course materials and handouts are easily shared among colleagues through social media platforms with mean values of responses as 3.5, 3.8 and 3.6 respectively. The grand mean of 2.98 on awareness of preservice teachers on the use of social media for learning which as above 2.5 benchmark of a 4 point Likert scale indicated that the students have ample awareness that social media is useful for their academics.

H_{O1}:   There is no significant difference in the use of social media for learning by COE students based on gender.

Table 1:
t-test on Colleges of Education Students' Use of Social Media for Learning

Variable	N	X	SD	Df	t	Sig	Remark
Male	104	1.74	0.66				
				198	0.592	0.653	Not Rejected
Female	96	1.79	0.73				

Table 1 shows that df = 198, t = 0.592, p = 0.653, this implies that the hypothesis which states that there is no significant difference in the use of social media for learning by COE students based on gender was not rejected. It is evident from table 1 that both gender have the same disposition towards the use of social media for learning in colleges of education in Kwara State.

Discussion and Conclusion

The study revealed that Colleges of Education Students are aware that social media can be used for learning and they often log on to Google, Whatsapp and Facebook for learning. Colleges of education students always visit Social Media sites in order to acquire academic materials for learning purpose. It can be further concluded that the use of social media influences colleges of education students learning as it was discovered from the result of the analysis that was carried out that colleges of education students understand more when they learn from Social Media; colleges of education students assimilate faster and remember easily when they learn with Social Media; and they understand and learn better when they log on to Social Media for learning. It can also be concluded that colleges of education students could be distracted if they use Social Media for learning as the features of social media makes it preferable for them to use for learning.

Recommendation

In conclusion, effective use of Social Media in the teaching and learning process will bring about benefits in the academic and administrative purposes to the students and the instructors, therefore, the use of social media in teaching and learning in tertiary institutions should be encouraged and adequately monitored. All tertiary institutions may benefit from recognizing the enormous value in blending the best traditional teaching and learning experience with those enhanced by the emerging technologies such as Google, Google+, Whatsapp, Facebook, and the likes. Using this technology enables easy sharing and accessibility of academic materials from the educators to the students, from the students to the educators and from the students to the students. It is important for educators to embrace these latest technologies and explore their benefits to the fullest.

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ASSESSMENT OF UNDERGRADUATE ATTITUDE TO AND UTILISATION OF MOBILE TECHNOLOGIES FOR LEARNING IN LAGOS-STATE

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Abstract

Mobile technologies is referred to any device(s) that one can carry along to perform a wide variety of "tasks" such as cellular phones, IPOD, Ipad, Personal Digital Assistance (PDA), laptops, and smart phones Mobile Technology Association of Michigan. It motivates undergraduate student to learn, it inspires self-confidence and it also helps the students in the areas of mathematics and science. In spite of the benefits of mobile technology in higher institution it has been underutilized for learning by undergraduates students in Nigeria, thus; this study investigated (i) type of mobile technologies used by undergraduate students for learning in Lagos-state (ii) the influence of male and female undergraduate student's attitude towards the use of mobile technologies for learning in Lagos state (iiii) influence of undergraduate students' attitude towards the use of mobile technologies for learning based on 'proprietorship . The study employed a descriptive research of the survey type to elicit responses from the respondents. A total of 298 (173 males, 123 females) undergraduates' students were randomly sampled from two selected universities in Kwara state. Researchers-designed questionnaire was used to elicit information from the respondent was tested for reliability using Cronbach Alpha and 0.71reliability coefficient at 0.05 level of significance. The research questions were answered using percentage while independent t-test statistics were used to test the hypotheses at 0.05 level of significance with the aid of Statistical Package for Social Science version (SPSS) version at 20.0. The result of the findings indicated that (i) Android phone is the most commonly used mobile technologies by undergraduate students in Lagos State (ii) there was no significant difference between male and female undergraduate students attitude towards the use of mobile technologies for learning (ii) there was no significant difference in undergraduate students' attitude towards the use of mobile technologies for learning in selected Universities based on school proprietorship. Based on the findings, it was recommended that undergraduate students should adopt the use of mobile technology for learning since this technology is useful for learning. Also, seminars, workshops and conferences should be organized for male and female undergraduates' students on the usefulness of mobile technology for learning since the findings of this study showed no gender bias.

Key words: Mobile Technology, ICT, Gender

Introduction

Information and Communication Technology (ICT) is a force that has changed many aspects of the way we live. To compare fields such as medicine, tourism, travelling, business, law, banking, engineering, architecture and education, the impact of ICT across the past two or three decades is enormous. The way these fields operate now is vastly different from the ways they operated in the past two or three decades (Soloway & Prior, 1996. The impact of (ICT) on education is gaining its popularity. In order to fulfill the Vision 2020 of Nigeria, the educational system has to be transformed and driven by ICT. Thus, ICT is becoming increasingly influential factor that could facilitate and speed up the transformation expected in education. Information and Communication Technology (ICT) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer, and network hardware and software, satellite systems and so on, as well as the various services and

applications associated with them, such as videoconferencing and distance learning (Bhattacharya & Sharma, 2007). ICT is the key tool giving birth to the contemporary e-Commerce, e-Government, e-Medicine, e-Education, teleconferencing, data-conferencing and videoconferencing. Computers and mobile phones are being widely used in developed countries both to complement established education practices and develop new ways of learning such as online education . This gives the opportunity to people in remote locations to have access to both formal and informal education.

Crede and Mansell (1998) affirmed that ICTs are crucially important for sustainable development in developing countries. This means that ICT can serve as a tool to improve the teaching and learning process in schools. ICTs are technologies used for collecting, storing, editing and disseminating information in various forms . National Open University of Nigeria (NOUN, 2009) stated that ICTs are the forms of machineries used to store, retrieve, process, and transmit information across the world. With ICT, the tendency for any individual to get information at his finger tip is high also ICT instruments can help to nurture educational reform so as to prolong learning beyond the lecture theatre. ICT holds the key to the success of reforming information services, meaning that the applications of ICT are numerous but mainly, it is used in converting the existing paper-print records to the entire process of storage, retrieval and dissemination (Rana, 2009). However, *higher education is approaching the point at which Science and Technology particularly Information and Communication Technology (ICT) plays a vital role in nearly all phases of the educational process. In the education sector, tertiary institutions use computers and other mobile technologies in their academic programs in order to produce good quality of research output and learning* (Philip, Oluwatolani, & Adeniran, 2010)

Mobile technologies is referred to any device(s) that one can carry along to perform a wide variety of "tasks" such as cellular phones, IPOD, Ipad, Personal Digital Assistance (PDA), laptops, and smart phones Mobile Technology Association of Michigan. Mobile technology according to Wikipedia (2011) is defined as the technology used for cellular communication. These mobile technologies are "small, self-directed and modest enough to go with at every moment in our every-day life, and it can be used for some form of learning". Mobile technologies if used for learning will move more and more outside the classroom and into the learner's environments, both real and virtual, thus becoming more situated, personal, collaborative and lifelong (Lonsdate, Baber, Sharples, & Arvanitis, 2003). Mobile technologies are very helpful and useful to man in many different ways, for example, Trifonova and Ronchetti, (2008)mentioned that it allowed interaction with people via voice and through the exchange of written messages, still and moving images. They are good devices for evaluating content, which can be stored locally on the device or can be reached through interconnection. These technologies are good and they can help provide solution to many of the day-to-day activities, it motivates undergraduate student to learn, it inspires self-confidence and it also helps the students in the areas of mathematics and science. The implication of this is that mobile technologies can be used by students to access content of coursework and kept for reference purpose (Trifonova & Ronchetti, 2008).

Mobile technologies in this 21st century are much more than just cell phones. The capability of using mobile technologies can be seen in the following sectors: it can be used to manage transportation and logistics, enable security and public safety systems, provide healthcare services, increase productivity in industrial/manufacturing environments, manage the mechanical systems of commercial and industrial buildings, and increase consumer convenience through mobile commerce and much more. In fact, in the midst of a paradigm shift is the way businesses are operated and consumers manage their personal and work lives (MTAM, 2014).As a result, mobile technologies have literally saved lives. Consider that mobile technologies are commonly used in the medical industry to enhance and simplify how things areto be done and carried out. Through phone calls, SMS messaging, mobile internet browsing and many more avenues, undergraduate students can stay connected as a society and keep in touch both in times of

relaxation and in times of need. Mobile technologies have truly touched the lives of millions of people (Chris, 2012). The development of mobile technologies, wireless communication and network technologies have been extremely advanced. Their integration can enlarge technologies as a part of campus environment for teachers and students to use (Weiser, 1998). Mobile technologies enable the teacher and students to utilize computing power anytime and anywhere, while the internet and wireless technologies enable mobile devices to interconnect with other computing devices seamlessly thereby making the undergraduate students to utilize it for learning.

Learning with mobile technologies means to use the technologies as cognitive tools to create constructivist learning environment. Moreover, researches have shown that the learning process might be changed as an effect of predominant media being used, technology or media is being evaluated successfully as type of cognitive tool (Kenny, 2001). Therefore, mobile technologies can play an influential role in improving the learning performance of the undergraduate students. It is apparent that media does play an important role in the design of an instructional method because technology can make a ready learning resources for learner oriented and interactive environment in a less expensive way (Ayonote-Yusuf, 2012).

An empirical study suggested the advantages of using these technologies and mobile devices in learning environments, which include enhancing availability and accessibility of information by students in learning activities in diverse physical locations, supporting group work on projects, and enhancing communication and collaborative learning in the classroom (Gay, Stefanone, Grace-Martin, & Hembrooke, 2001; Goldman & Kaufman, 2001). Mobile phones have positively contributed to the field of learning in many different ways. First, mobile phones help undergraduate students (learners) to improve their literacy and expertise skills, to identify their present abilities and it can be used to encourage both independent and collective learning experiences between peers (Attewell, 2005).Also, mobile phones help learners to identify areas where they need help and support. Attewell, further reiterated that mobile phones helps bridge the gap between mobile phone literacy and ICT literacy. Moreover, it helps to remove some of the formality from the learning experience and engages unwilling learners. Besides, it helps learners to remain more focused for longer periods. Ultimately; it helps to raise self-esteem and self-confidence (Attewell , 2005). Mobile phones makes the students have more exposure and also helps reduce the fear towards the use of ICT thereby developing skills that will enable the learner to apply their knowledge to explain phenomena happening around them and to solve problems.

Assessment on utilization of mobile technologies for learning was considered for the purpose of this study. The word assessment comes from a root word assess which means determining the amount of something, or to determine the importance of someone or something (Merriam-Webster Online Dictionary, 2005). To determine the level to which undergraduate students use their mobile technologies for learning, variable such as attitude, gender, and school proprietorship were considered. Attitude is an important variable to be considered as to how undergraduate students use their mobile technologies for learning. Admittedly, the approach of students towards the use of these technologies for learning is important. Yusuf (1998) affirmed that attitude is the regulator of actual behavior of an individual either consciously or unconsciously.

Little-john (2002) also described attitude as a built up of information about an object, person, situation or experience, or a disposition to act in a positive or negative way toward some object. From this theorist, attitude that students put on towards using any of the mobile technologies for learning play a very important role in influencing subsequent behavior towards it. (Meneal & Hooft, 2011) researched on the attitude of students towards the use of mobile phone in learning. It was discovered that a good number of the students responded that mobile technology devices such as mobile phone have assisted their overall learning process, helps to plan better for learning, and enables learners to be more productive compared to

those who gave a neutral and negative response. From the findings, it can be deduced that positive attitude on the part of the students is important if learning with mobile technologies is to be effective .However, no matter how positive the attitude may be, variable such as gender needs to be considered. Gender is an important variable that influence the use of computer and mobile technologies for learning. Ajunwa (2004) found out that gender disparity in ICT favours the male. A study conducted by Liu (1999)has revealed that females show negative attitude to computer than male. Also, studies conducted by (Lenhart & Madden, 2005; Odell, 2000; Sherman, End, & Kraan, 2000) suggested that men and women use these technologies in different ways.Increased gender inequalities, even in the short-run, are having long-term consequences for economic growth and human development . Thus it is not surprising that one of the key target objectives of the Millennium Development Goals (MDGs) is the promotion of gender equality and women's empowerment. The goal of *MDGs tends towards avoiding gender bias but bringing equality in between them.* Further, Ramayah and Osman (2005) revealed that male students use the course websites more than female students and the fact remains that the length of time spent in an environment or job will definitely affect learning.

Another important factor to be considered is school proprietorship. School proprietorship in this context could be regarded to as the owners of school which include the private school owned by an individual, a body or an organization, the state school owned by the state government, and the federal school owned by the federal government.Stakeholders in education have looked at issues regarding school ownership as an important factor that affect learning activities which in turn affect the performances of students. School proprietorship can be viewed in three different perspectives such as the state school, the private school and the federal school. Oke and Maliki (2009) described the state school to mean any school that is controlled and supported by the state or the national government. The private school is a school that is supported by the religious, social organizations, other private groups or individuals while the federal school is a school that is supported or controlled by the federal government.

Maliki, Ngban and Ibu (2009) postulated that there is a widely held assessment that the undergraduates' students in the private schools performs better than those in the federal, while those in the federal schools do far better than their colleagues in the public schools across the globe. On the school proprietorship and performance, it can be deduced that students from private school often perform better than their colleagues in the federal and public schools.

From the discussion so far, it can be deduced that mobile technologies can go a long way to affect the learning outcome of most undergraduate students if only they can effectively show a positive attitude to and utilize the technologies to source and access scholarly materials available and that are relevant to every discipline regardless of location, time and the number of people accessing the materials. However, the contribution of this study to the field of education cannot be underestimated in Nigeria. The outcome of this study will provide additional knowledge; hence, the need for this study, assessment of undergraduate student's attitude to and utilization of mobile technologies for learning in Lagos State, Nigeria.

Research Purpose

The main purpose of this study was to assess undergraduates' attitude to and utilization of mobile technologies for learning in Lagos state, Nigeria. Specifically, the study will;

1. type of mobile technologies used by undergraduate students for learning in Lagos-state;
2. the influence of male and female undergraduate student's attitude towards the use of mobile technologies for learning in Lagos state and
3. Influence of undergraduate students' towards the use of mobile technologies for learning based on proprietorship.

Research Questions

The following research questions were answered in this research:

1. What type of mobile technologies do undergraduate students use for learning?
2. How does undergraduates' attitude influence the use of mobile technologies for learning based on gender?
3. How does undergraduates' attitude influence the use of mobile technologies for learning based on proprietorship?

Research Hypotheses

Based on research questions two to four, the following null hypotheses were formulated and tested in this study:

H_{o1}: There is no significant difference in male and female undergraduate student's attitude towards the use of mobile technologies for learning.

H_{o2}: There is no significant difference in undergraduate students' use of mobile technologies for learning based on gender.

H_{o3}: There is no significant difference in undergraduate student's attitude towards the use of mobile technologies for learning based on school proprietorship.

Methodology

The study was a descriptive research using survey design. This method enabled the researcher to describe events just as they appear without the manipulation of external researchers. The target population consisted of all undergraduate students in two Universities in Lagos State namely: University of Lagos and Lagos State University. The sample size was all undergraduate students from the chosen Universities. Simple random sampling technique was used to select 258 undergraduates from the sampled Universities while Israel model (2013)was used to determine the sample size of the respondents used for the study.

The instrument for this study was a researcher designed questionnaire and it was validated by the researcher's supervisor and three educational technology lecturers in the Department of Educational Technology, University of Ilorin, reviewed the questionnaire in order to determine the appropriateness, content coverage in terms of acceptability, adequacy and relevance to the stated objectives. Their comments, suggestions and corrections were used to produce a final draft of the instrument. The reliability of the questionnaire used in this study was achieved by administering twenty copies of the questionnaire on twenty undergraduate students in University of Ilorin, Ilorin, Nigeria which was not part of the sampled institutions. Cronbach alpha was used to test the reliability of the instrument at 0.71. The researcher personally administered 300 questionnaires to the respondents and was able to collect only 296 that is, 98% from the respondents. The collected data were analyzed using descriptive and inferential statistics. Percentage, mean, and t-test were used to analyze data for the research questions and hypotheses with the aid of statistical package for social science (SPSS) version 20.0 at 0.05 level of significant.

Results
Research Question One: *What type of mobile technologies do undergraduate students use for learning?*

Table 1:
Most Commonly used Mobile Technologies by Undergraduate Students in Lagos State.

S/N	Mobile Technologies	No of Respondents (Users)	No of Respondents (Non - Users)
1	Laptop	178 (60.1%)	118 (39.9%)
2	Tablet	45 (15.2%)	251 (84.8%)
3	Ipad	22 (7.4%)	274 (92.6%)
4	Ipod	9 (3.0%)	287 (97%)
5	PDA	2 (0.7%)	294 (99.3%)
6	Blackberry	122 (41.2%)	174 (58.8%)
7	Android	199 (67.2%)	97 (32.8%)
8	Iphone	6 (2%)	290 (98%)

Table 1, reveals that Android phones has the highest number of users among the mobile technologies used by undergraduate students with 199 (178%) users, followed by Laptop with 178 (60.1%) users, Blackberry with 122 (41.2%) users, Tablets with 45 (15.2%) users, Ipad with 22 (7.4%) users, Ipod with 9 (3.0%) users, Iphone with 6 (2%) users and PDA with 2 (0.7%) users, which is the least used among the mobile technologies. Therefore, based on the figure in table 6, it can be deduced that Android phone is the most commonly used mobile technologies by undergraduate students in Lagos State.

Hypothesis Testing
H_{01}: *There is no significant difference in male and female undergraduate students'attitude towards the use of mobile technologies for learning in selected Nigerian Universities.*
Table 2: Independent Sample t-test on Undergraduate Students Attitude towards the Use of Mobile Technologies for Learning based on Gender

Gender	N	Mean	SD	T	df	Sig. (2-tailed)	Remarks
Male	173	33.77	3.74	0.07	294	0.95	Not Rejected
Female	123	33.74	3.75				
Total	296						

From Table 2, it can be deduced that there was no significant difference between male and female undergraduate students attitude towards the use of mobile technologies for learning. This is reflected in the result: $t (294) = 0.07$, $p > .05$. That is, the result of t-value of 0.07 resulting in .95 significance value was greater than 0.05 alpha values. Thus, the hypothesis was accepted. This implies that there was no significant difference between male and female undergraduate students attitude towards the use of mobile technologies for learning.

H_{02}: *There is no significant difference in undergraduate students attitude towards the use of mobile technologies for learning in selected Nigerian Universities based on school proprietorship*

Table 3:
Independent Sample t-test on Undergraduate Students Attitude towards the Use of Mobile Technologies for Learning based on School Proprietorship

School Proprietorship	N	Mean	SD	T	Df	Sig. (2-tailed)
Federal	159	34.16	3.45	1.99	294	0.05
State	137	33.29	4.01			
Total	296					

According to Table 3, t (296) = 1.99, p > .05. That is, the result of t-value of 1.99 resulting in 0.05 significance value was equal to 0.05 alpha values. This means that the null hypothesis is not rejected. By implication the stated null hypothesis was established thus: There is no significant difference in undergraduate students attitude towards the use of mobile technologies for learning in selected Nigerian Universities based on school proprietorship. Based on the earlier mean score of undergraduate students' attitude, this means that both federal and state schools use mobile technologies for learning in Nigerian Universities.

Conclusions and Recommendations
The result obtained from the data gathered and analyzed in this study established the fact that all undergraduate students in Nigerian Universities used at least one or more mobile technologies and the most used mobile technologies by the undergraduate students for learning is Andriod phone. From the study, it is clear that undergraduate students from both the federal and state Universities showed a positive attitude towards the use of one or more mobile technologies for their learning. This implied that school proprietorship is not a barrier as to the use of mobile technologies for leaning in Nigerian Universities, it was recommended that female undergraduates are to redirect their focus on the use of mobile technologies towards learning and not for social media School proprietorship should encourage their undergraduate students not to allow the use of their mobile technologies to hinder their concentration in the classroom.

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ANTHROPOMETRIC EVALUATION OF A NIGERIAN UNIVERSITY'S COMPUTER LIBRARIES

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Abstract

Computer library is a place where computers are kept for the safe use of learners and facilitators' in an instructional system for research and curative purpose. The conventional library consisting of physical books is being rapidly substituted by the paperless electronic-library. Students spends long period of time in the electronic library (e-library) staying in static position and posture, and as a result vulnerable to Computer-related Illnesses. The main purpose of this study therefore was to conduct an ergonomic and anthropometry evaluation of computer libraries in University of Ibadan, Oyo State, Nigeria. The dimension of the furniture in e-library were taken, so also the various body dimensions such as sitting height, knee height, popliteal height, buttock to popliteal height among others were taken from the students. 5th, 50th and 95th percentile of the data were computed and analyzed with SPSS version 21.0 statistical package. Based on the obtained anthropometric data, mismatch analyses were carried out and there were notable mismatch between the various anthropometric dimensions of the users and the furniture dimensions. It was therefore concluded that the furniture in the computer section of the library are not ergonomic enough for the students and recommended that indiscriminate use of furniture should be avoided

Keywords: Ergonomic, Anthropometric and Computer Library

Introduction

It is no more a conjecture that Information and Communication Technology (ICT) has an enormous impact on every sphere of life, as the fact that computer and other ICT appliances and gadgets will revolutionize the word had become a reality.ICT is an household term that has as many definitions as there are researchers and educators and it refers to diverse myriad of technology, technological tools and resources used to create, communicate, disseminates, store, and manage information (Hamilton-Ekeke & Mbachu, 2015). It is seen as a term that involves all types of technologies for manipulating and communicating information (Ogunlade, 2014).

Computer is the nucleus and heart of ICT and has been regarded as the hallmark of technological advancement and it has been defined as an electromechanical device that is capable of accepting data as input in a prescribed format, process the data, and give information as output (Onasanya & Adegbija, 2007). Computer varies in sizes and shapes, forms and features, purpose and versatility to include the desktop computer, laptop, portable digital assistants, and anthropomorphic computers. It has been regarded as the all-purpose machine whose usage is a trend in technological advancement and because of its versatility, it has very high applications in human life (Davari, 2013). Computers have the greatest impact on our lives becoming an epitome of modern times, being used in every aspect of life and altering the daily work of large businesses and industry which makes nearly everyone in this digital world to be spending a lot of time in front of a computer (Onasanya, Daramola, Adegbija, & Olumorin, 2012). Working with computers has become a constant in today's world with such benefit that cannot be over

emphasize(Lale, 2013). The paradigm shift in the use of computer is evident in our languages nowadays as the computer terms and technical terminologies are being added to society's vocabulary (Yusuf, 2005).

Computers because of its uses has been relevant in all aspect of human life and has a result   found its way into the offices, administrative offices, schools and even homes (Wisegeek, 2015). And because of the prevalent use of computer in education, the computer is becoming more and more ubiquitous in the school, particularly in the Nigerian Universities. In the university computers are commonly found in offices for secretarial work. Large numbers of computers are usually found computer laboratory, computer rooms, ICT centres and computer libraries with computers of all types and varying sizes which are indispensable pedagogue tools in teaching-learning activities in learning environments in the universities. The integration of computer into human life has being changing the face of things and how things are done. Many institutions and processes are becoming digital, paperless and online based. The educational sector is not left out of this ICT transformation as pedagogue activities and other teaching learning activities are becoming ICT based. One of the key element in the university that has been transformed by ICT is the library.

A library has been defined as an organized collection of information resources made accessible to a defined community for reference or borrowing (Ogendengbe, 2015). It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both. A library's collection can include books, periodicals, newspaper, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, ebooks, audio books, database and other formats (Ashaolu,& Itsekor, 2014). Libraries range in size from a few shelves of books to several million items. It is a place in which literary and artistic materials, such as books, periodicals, newspapers, pamphlets, prints, records, and tapes, are kept for reading, reference, or lending. Hence, the library can be generally described as an essential part of an institution which facilitates learning, study and research (Ogedengbe, 2015).

The computer library is a place in learning environments where computers are being place for safe and convenient use of the learners. A computer library or e-library is a cluster of computers that are usually networked and available for use by the public. University students makes use of the computer library for various research and academic purposes. Students spends long period of time in the library staying in static posture (Reddy, 2015). Computer library or the e-library is the electronic version of the old library. The old library belongs to the old economy while computer library or e-library belongs to the new economy.   The e-library consists mainly of computers and it is characterized by the absence of books and papers (Ashaolu,& Itsekor, 2014).

However, poor interaction between the computer and the user can lead to health problem, such as eyestrain, backache and swollen wrist students spend a lot time in the computer library in various sitting positions (Momodu et al., 2014). Along with the expanding and arbitrary use of computer technology have come reports about adverse health challenges for computer users (Apple, 2015). As useful as these devices are, they can also be significantly damaging for users who continuously utilize these devices by impairing their musculoskeletal system as incompatible users perform repetitive tasks for extensive hours (Lale, 2013).

The various *cognate* researches from several cognoscenti researchers Lale and Korhan, (2015), Odunaiya, Owonuwa, & Oguntibeju (2014), Dunmade, Adegoke, and Ayodeji (2014)*, Omondi*, Mailutha and Mukundi (2013), Lale (2013) and Johnson, Onigbinde, Onasanya, Emechete, and Gbela (2008), *editorialize that there* are concerns regarding negative consequences of computers as a result of the improper use of computers which can cause serious physical injury to the user even if the duration of use is less trivial. The literatures had adduced evident proof of ill health arising from the poor workplace design, improper use of computer, prolonged periods of computer use, can result in visual, musculoskeletal and psychological problems, being confined to awkward postures for specific task demands, at given situations or as influenced by poorly designed products over extended periods,

provokes psychophysiological stress and imposes negative effects on human mental and physical performance. Epidemiological studies such as Ogedengbe (2015), Asaolu and Itsekor (2014), Osquei-Zadeh, Ghamari, Abedi, and Shiri,(2012), and Adeyemi (2010) apprised that the ergonomic factors that affect the comfort and pleasure of library users include reading table and chair parameters, thermal factors such as relative humidity and air temperature, level of sound and noise and the light intensity.

Ogedengbe, (2015), Adeyemi (2010) and Adedoyin, Idowu, Adagunodo, & Idowu, (2004)observed that ergonomic hazards impact negatively on students and staffs in the computer library and that computer workstations in the university's' computer libraries should be designed with both the user and the task in mind so that the academic task can be performed comfortably, smoothly and efficiently. It is therefore necessary for every institution to consider ergonomics while designing its library as this would affect its overall productivity. The use of unergonomic computer workstations often results in Computer-related Illnesses (CRI) (Gupta, Arora, & Gupta, 2013).

Computer-induced health problems is an umbrella term for the various problems a computer user can develop (Gyekye, 2006). Sjan-Mari (2013)argued that prolonged posture whilst using computers and a learner   chair mismatch is associated with spinal pain in adolescents. The health problems that can arise from using computers can be generally defined as the many anomalies a computer user may experience from using computers extensively over a prolonged period of time in an inefficient manner.

Ergonomic has been defined as the scienti?c discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance. Ergonomists contribute to the design and evaluation of tasks, jobs, products, environments and systems in order to make them compatible with the needs, abilities and limitations of people (International Ergonomics Association [IEA], 2003). Ergonomics is a way of designing workstation, work practices, and workflow to accommodate the capacities of workers (Zunjic, Papic, Matija, Matija, Slavonic, & Lukic, 2015). Ergonomic design reduces risk factors known to contribute to occupational injuries and illnesses, such as sprains and strains and cumulative trauma disorders (CTDs). If work is performed in awkward postures or with excessive efforts, fatique and discomfort may result. Under these conditions muscles, tendons, ligaments, nerves, and blood vessels can be damaged. Injuries of this type are known as musculoskeletal disorder (MSD) (Occupational safety & health Training [OHSAacaddemy] (2013).

Educational Ergonomics is concerned with the interdependence of Education performance and design of educational facilities. Educational ergonomics has the capacity to enhance the performance of students and educational systems to a substantial degree (Onawumi, Oyawale, & Dunmade, 2016). Educational ergonomics have been classified into four domains: physical, cognitive, neuroergonomics and social or organizational.Whereas physical ergonomics deals with human anatomical, anthropometric, physiological, and biomechanical characteristics as they are related to physical activity, cognitive ergonomics is concerned with mental processes, such as perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system. Organizational ergonomics deals with the optimization of sociotechnical systems, including their organizational structures, policies, and processes, while Neuroergonomics involves the application of more in-depth neurophysiological methods such as brain imaging techniques (International Ergonomics Association [IEA], 2003). Physical ergonomics shall be the focused in this study which rests on the underlying scientific field of anthropometrics.

Heiting (2015)defined computer ergonomics as a discipline which addresses ways to optimize the computer workstation to reduce the specific risks of computer related illnesses. Kerst(2011)defined computer ergonomics as the designing of the workstation characteristics to match human performance capabilities. Computer ergonomics refers to human factor related to the use computers. It is the study of the relationship between people and their working environment. Ergonomics deals with designing efficient and safe chairs, desk and appropriate work environment (Eyitayo & Eyitayo, 2010).

Computers are one example of human use of machines and the application of the principles of ergonomics to computer work station can reduce these health risks and increase comfort and efficiency. Students using computers inadequately placed or positioned can result in a wide range of injuries (Pinder 2016). Student remain seated at school for a considerable amount of time and most computer workstation (CW) did not meet standard description of CW and majority of the computers users had pain in their low back as a result (Johnson et al., 2008). Sitting, which is the work posture of students in a learning environment, should be properly done to avoid backaches, strain, fatigue and extra stress on the neck and back (Onawumi & Lucas, 2012a), (Onawumi & Lucas, 2012b). Placement of the seat should therefore permit the full range of seat adjustments, unobstructed visibility out of the front windshield, and comfortable reach of the controls and foot pedals (Onawumi, Lucas, & Adebiyi, 2012).

Ergonomically unsuitable seat gives rise to psychophysical fatigue, (Stana, Jovan, Snjezana, & Natalija, 2010). It also increases the risk of lumbar discs deformation, neck pain, back and shoulder tension and reduced blood circulation in the legs and buttocks, (Mazloumi, Fallah, & Tavakoli, 2012). Also inimical to people's health is electromagnetic pollution that computer users are being exposed to, such as electromagnetic fields and other harmful emissions which emanates from the visual display Unit (VDU), uninterrupted power suppliers (UPS) and rays emitting gadgets. the electromagnetic fields emitted by the monitors were observed to decrease the level of melatonin and increase the level of Adrenocorticotropic Hormone (ACTH) in the body (Eyitayo & Eyitayo, 2010).

Poor ergonomic while using the computer can lead to work-related musculoskeletal disorders (WRMD) and other forms of postural damage that may result in physiological illnesses that are developed due to prolonged mechanical stresses imposed on the musculoskeletal system. Varte, Rawat, Singh, and Majumdar (2015)revealed that increased exposure to computers and related workstation, uncomfortable furniture, types of jobs performed and the length of working hours in an unchanging position and general lack of movement have been identified as potential risk factors for back pain. On the other hand, ergonomically designed furniture can reduce postural discomfort and reduce musculoskeletal and postural problems (Shikdar & Al-Kindi, 2015).

Anthropometry is the scientific measurement and collection of data about human physical characteristics and the application of these data in the design and evaluation of systems, equipment, manufactured products, human-made environments, and facilities which deals with the measurement of size, mass, shape, and inertial properties of the human body. This field is interdisciplinary consisting mainly of anthropometry, mechanics, physiology, and engineering. Its applications address mechanical structure, strength, and mobility of humans for engineering purposes (Federal Aviation Administration [FAA], 2003).

The study of anthropometrics or human measurement is concerned with the physical sizes and shapes of humans. Anthropometrics is a very important branch of ergonomics in research and application. Anthropometry relies on sophisticated methods to measure physical dimensions including static and dynamic measurements of specific populations. The results obtained from these methods are statistics that can be applied in the design of products, clothing, occupational, and recreational environments. Also, anthropometric data is essential in developing biomechanical models to predict human movement, reach, force, and space requirements (Ajayeoba, 2005). Anthropometry is concerned with measurement of physical sizes and shapes of human body (Oladipo, Okoh, & Hart, 2010).

The main purpose of this study was to carry out an ergonomic and anthropometric evaluation of computer laboratories in universities in Oyo States, Nigeria. The following research questions were answered:

1. What is the anthropometric analysis of computer libraries furniture?
2. What are the anthropometric analysis of computer libraries users? and
3. What are the anthropometric mismatch between the anthropometric dimensions and the   student furniture dimensions?

The major cause of musculoskeletal disorder and other forms of CRI is the posture and position of the computer user at the computer workstation. The human musculature and skeletal system as seen in figure 1 is supported by the spine. The spinal column consists of 33–34 vertebrae, 7 cervical vertebrae (C1-C5), 12 thoracic vertebrae (T1-T12), 5 lumbar vertebrae (L1 – L5), 5 sacral vertebrae (fused) (S1 – S5) secondarily fused to the sacrum and 4–5 vertebrae coccygeal that form the coccyx as seen in figure 35. The vertebrae work as a functional system and each? of the vertebrae is separated by shock absorbing disks called intervertebral disc as seen in figure 1.
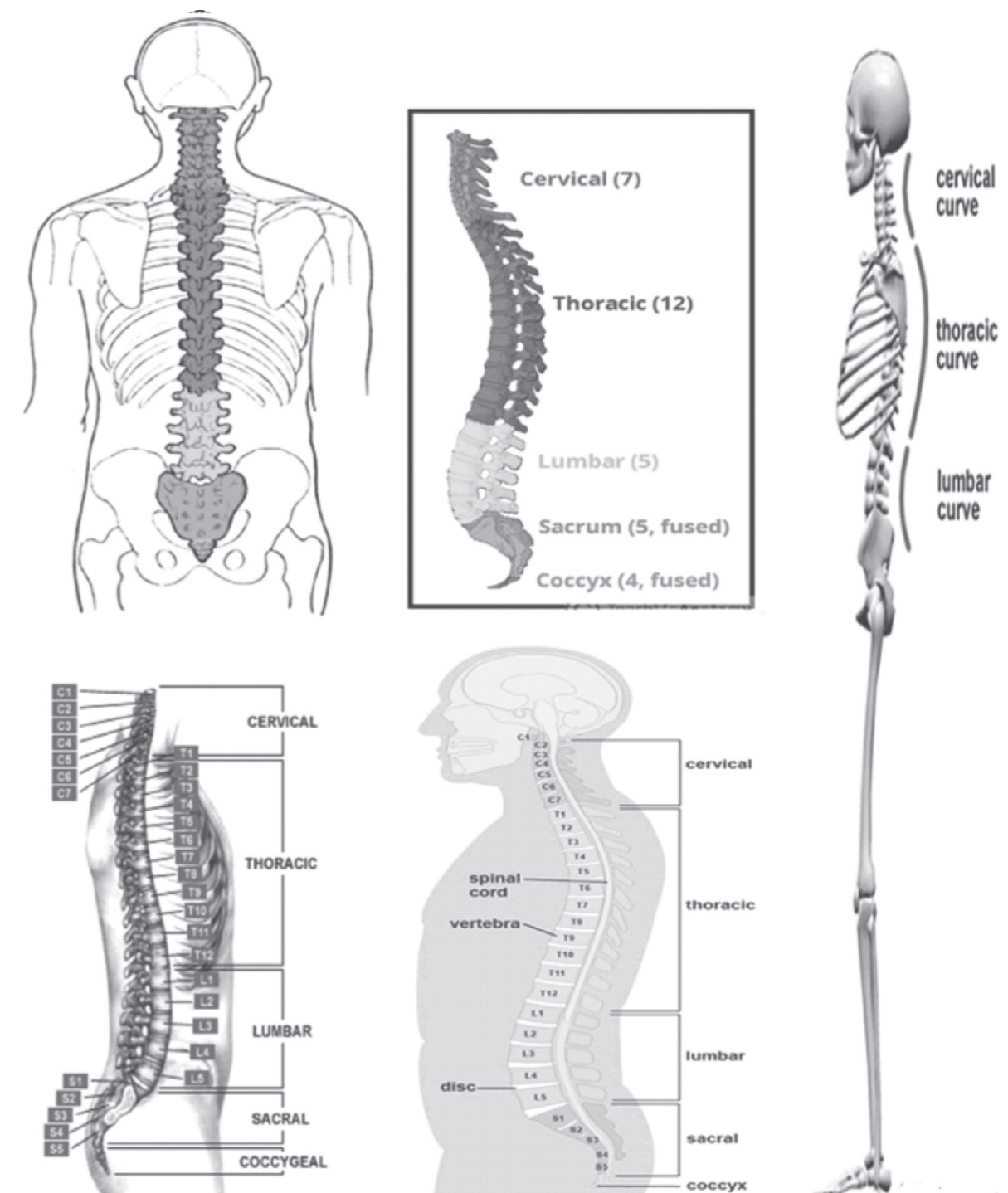
Figure 1: Anatomy of the Spine

Source: Maryfield Brain and spine (2017).

The spine is made of 33 individual bones stacked one on top of the other. This spinal column provides the main support for the human body and allows people to stand upright, bend, and twist, while protecting the spinal cord from injury. Strong muscles and bones, flexible tendons and ligaments, and sensitive nerves contribute to a healthy spine. Any of these structures affected by strain, injury, or disease while working on the CW can cause pain (Mayfield Brain and spine, 2017; IGEA Brain and spine, 2017; and Goodman Campbell Brain and Spine, 2017). An adult spine has a natural S-shaped curve and the spinal curves shape should be maintained. The spine has three natural curves that form an S-shape. The neck that is cervical spine and low back that is lumbar spine regions have a slight concave curve, and the thoracic and sacral regions have a gentle convex curve as seen in Figure 1. The curves work like a coiled spring to absorb shock, maintain balance, and allow range of motion throughout the spinal column. The five regions of the spinal column see figure 1. Strong muscles keep our spine in alignment as seen figure 1, the muscles and correct posture help in maintaining the natural spinal curves.

Good posture involves training the body to stand, walk, sit, and lie so that the least amount of strain is placed on the spine during movement or weight-bearing activities. Excess body weight, weak muscles, and other forces can pull at the spine's alignment. The normal adult spine is balanced over the pelvis, requiring minimal workload on the muscles to maintain and upright posture. Any form of posture and position while working on the computer workstation that results in spinal balance can result in strain to the spinal muscles and deformity of the spine as it attempts to maintain an upright posture. The following are postural disorder as a result of abnormal spine curve. Lordosis also called sway back, kyphosis also called hunchback, and scoliosis are skeletal disorder as a result of abnormal curve of the lumbar spine, thoracic spine and curve from side-to-side of respectively.

Any posture on the CW that alter the "S" shape of the spine will result in CRI. Chairs and tables that are not ergonomic enough will coerce the user to conform to "C" curve. A good ergonomic chair should provide backrest that will put the user in a position that supports the "S" curve of the spine, such chair should provide adjustability in the backrest, seat pan, and seat height. Armrests should be adjustable also, or else no armrest should be provided as seen in figure 2.
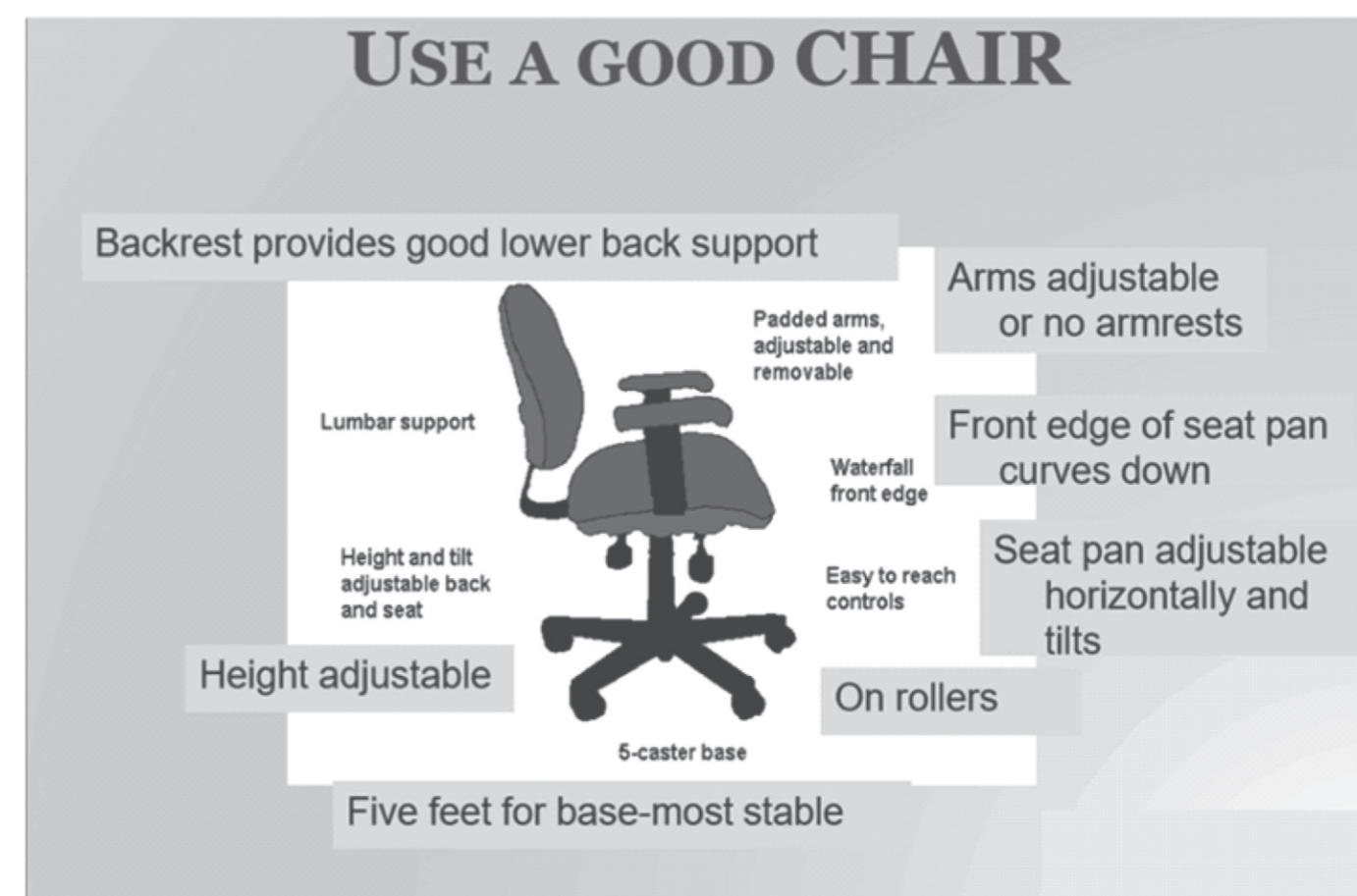
Figure 2: Features of an Ergonomic Chair
Source: Fermanich (2014)

Methodology

This study employed the anthropometric approach to ergonomics wherein anthropometric measurements which involves the body dimensions of the students and the furniture dimensions and the mismatch was conducted. Also, the assessment of chairs, tables in the laboratories' structural dimension were investigated through physical measurement of ergonomically characterized features of the items and their relative position to the pupils in the classroom.

Data Analysis and Discussions

The analysis of the data ispresented in the following Tables with the discussions Research question one: What are the anthropometric analysis of computer laboratories users? The anthropometric analysis of computer laboratories users is presented in Table 1.

Table 1:
The Anthropometric Analysis of Computer Laboratories Users

	Height	Weight	Sitting Height	sitting eye height	Waist depth	Thigh clearance	Buttock to knee	Knee height	Seat length depth	Popliteal height	Seat width
NUMBERS											
MALE 502											
FEMALE 508											
TOTAL 1010											
MEAN											
MALE	68.68	81.6	109.4	20.7	47.6	57.4	47.0	47.6	46.5	30.2	169.5
FEMALE	73.8	84.0	107.5	19.5	45.8	57.8	51.6	48.0	45.4	36.9	163.0
BOTH	166.2	71.3	82.8	108.4	19.9	46.7	57.6	49.3	47.8	46.0	33.8
MINIMUM											
MALE	55.0	63.0	100.1	16.0	20.0	50.0	20.0	42.0	42.0	20.0	141.0
FEMALE	53.3	73.5	100.0	16.0	20.0	50.0	20.0	42.4	42.0	20.9	147.4
BOTH	8.7	10.3	43.6	5.9	3.9	14.8	4.1	11.3	4.2	3.2	6.4
MAXIMUM											
MALE	96.0	92.0	132.0	32.0	63.0	65.1	61.0	61.4	57.0	45.0	191.2
FEMALE	96.0	771.0	132.0	36.0	62.3	65.0	59.1	61.4	57.0	50.0	191.2
BOTH	191.2	96.0	771.0	132.0	36.0	63.0	65.1	61.0	61.4	57.0	50.0
PERCENTILE											
5TH %tile											
MALE	60.0	77.0	102.1	16.0	21.0	52.0	20.0	43.5	42.0	22.0	160.0
FEMALE	55.0	74.0	104.0	16.0	20.0	52.0	50.0	43.0	42.0	25.0	151.7
BOTH	154.0	55.0	74.0	102.7	16.0	20.0	52.0	20.0	43.0	42.0	23.7
50TH %tile											
MALE	68.0	82.0	107.0	21.0	55.0	58.0	54.0	50.0	46.0	30.0	170.0
FEMALE	75.0	77.0	105.5	17.0	52.0	56.0	50.0	45.0	43.0	38.8	160.0
BOTH	166.4	69.0	79.2	106.0	20.0	52.2	56.0	51.0	45.1	46.0	32.0
95TH %tile											
MALE	175.0	89.0	84.3	117.0	23.0	59.0	65.0	58.0	54.0	51.0	45.0
FEMALE	89.0	82.1	114.0	22.0	56.0	65.0	56.0	54.0	51.0	45.0	174.0
BOTH	175.0	89.0	84.30	117.0	23.0	59.0	65.0	58.0	54.0	51.0	45.0

Research question two: What is the anthropometric analysis of computer laboratories furniture?
The furniture dimensions are presented in Table 2

Table 2:

s/no	Name of Computer Laboratory	No of Chairs	Seat Height (cm)	Seat Depth	Seat Width	Backrest height	Backrest Width	Backrest Lumbar	Armrest height	Armrest Length	Distance Between Armrest	Table no	Height for Thigh	Depth for knees	Width for thighs	Sitting Height for Input Device
	FURNITURE DIMENSIONS															
1.	KENNETH DIKE LAB EAST WING	1	46.0	41.0	40.0	51.5	46.0						75.0		74.0	73.5
2.	KENNETH DIKE LAB WEST WING	1	46.0	41.0	39.5	38.0	46.0						73.0			69.0

Research question three: What are the anthropometric mismatch between the anthropometric dimensions and the student furniture dimensions?
The mismatch is given in Table 3

Table 3:
Library Furniture Dimension Combination Formulas

Dimension Combination	Formula
1 Chair Seat Height (CSH) and Popliteal Height (PH)	(PH + 2) cos 30 CSH P(l + 2) cos 5
2 Chair Seat Depth (CSD) and ButtockPopliteal Length (BPL)	0.80 BPL
3 Chair Seat Width (CSW) and Hip Breadth (HB)	1.1 HB
4 Chair Backrest Height (CBH) and Shoulder Height (SH)	0.60 SH
5 Table Height (TH) and Elbow-Rest Height (ERH)	CSH + ERH

| 5 | Table Height (TH) and Elbow-Rest Height (ERH) | CSH + ERH + 0.148 SH |
| 6 | Underneath Table Height (UTH) | (KH + 2) + 2   (0.852 EH + 0.148 SH - 4 |

Source: Osquei-Zadeh et al., (2012)

Table 3:
Anthropometric Match or Mismatch Status of in the Kenneth Dike Library West Wing's furniture, University of Ibadan.

KENNETH DIKE COMPUTER LIBRARY
Chair

Chair Parameters					Kenneth Dike Computer Library East Wing		Kenneth Dike Computer Library West Wing	
s/no	Chair	Related anthropometry data	Representative Value 50%ile	Estimated Value from formula	Furniture Dimensions	Remarks	Furniture Dimensions	Remarks
1.	Chair Seat Height (CSH)	Popliteal Height (PH)	PH=42.0	36.37≤CSH≤41.8	46.00	Mismatch	46.00	Mismatch
2.	Chair Seat Depth (CSD)	Buttock-Popliteal Length (BPL)	BPL=52.00	41.60≤CSD≤51.8	41.0	Mismatch	41.0	Mismatch
3.	Chair Seat Width (CSW)	Hip Breadth (HB)	HB=45.00	49.50≤CSW≤58.50	40.00	Mismatch	39.50	Mismatch
4.	Chair Backrest Height (CBH)	Shoulder Height (SH)	SH=65.01	38.5≤CBH≤51.8	48.00	Match	48.00	Match
5.	Backrest width	Waist breadth	HB=45.0		48.0	Mismatch	48.0	Mismatch
6.	Armrest Height	Elbow rest height/thigh clearance	ERH=55	5th percentile of sitting elbow height=thigh clearance	No arm rest		No arm rest	
7.	Distance between armrest	hip breadth/seat width	HB=31.0		No arm rest		No arm rest	

Table

Table Parameters			Kenneth Dike Computer Library East Wing		Kenneth Dike Computer Library West Wing	
8.	Table Height (TH)/ height for thigh	Elbow-Rest Height (ERH)(thigh clearance)	KH=59.0	75.0	Mismatch	73.0	Mismatch
9.	Depth for knees	buttock to knee	BTK=65.000	55.50-19.000 =36.500	Mismatch		mismatch
10.	Width for thigh	seat width/hip breadth	SW=38.80	74.0	Mismatch		mismatch
11.	Sitting height for input	popliteal height + elbow rest height	TC=52.0	73.50	Mismatch	69.0	mismatch

Table 3 revealed there is a mismatch in most the furniture dimensions in Kenneth Dike Library (West and East) Wing's furniture. There are notable mismatch in the various body dimensions of the users and the furniture dimensions in the Kenneth Dike computer library.

Conclusions and Implications

This study employs anthropometric knowledge to evaluate a Nigerian University library and it is recommended based on this study that adjusted furniture both chairs and table should be provided, and the promiscuous use of furniture should be avoided. The chairs should make provision for adjustability in the seat height, seat width, seat edge and backrest so as to ensure that users are not affected by various computer-related illness. The implications for this study is that CRI is inevitable if ergonomic factors are not considered and ergonomics might be a solution to CRI

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STUDENTS' LEARNING AUTONOMY AND FACILITATING CONDITIONS ON THE UTILIZATION OF BLENDED LEARNING AMONG PRE-SERVICE TEACHERS IN UNIVERSITY OF ILORIN, NIGERIA: IMPLICATION FOR EDUCATIONAL TECHNOLOGY

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Abstract

Blended learning is the combination of both the online and face-to-face instructions, thus, it is a means of innovative learning strategy for the pre-service teachers. However, the efforts in the use of blended learning are yet to fully materialize. Thus, this study examined the learning autonomy and facilitating conditions on the utilization of blended learning among pre-service teachers and its implication for educational technology. The population for the study comprised all pre-service teachers in the Faculty of Education, University of Ilorin while 150 educational technology final year students were randomly sampled. Descriptive survey research type was adopted and a 4-point Likert-type scale questionnaire was used. Thus, four research questions and two hypotheses were answered and tested using mean and t-test statistical tool respectively. The findings revealed that; blended learning enhanced learning autonomy with the mean rating of 3.3 using 2.5 as the benchmark; pre-service teachers accepted that there were conditions that ease the utilization of blended learning with the mean rating of 3.0 using 2.5 as the benchmark; no significant difference existed between the opinion of pre-service teachers on the impact of blended learning on learning autonomy based on gender; and no significant difference existed between the opinion of pre-service teacher's gender on the conditions that facilitate the utilization of blended learning. The study concluded among others that blended learning facilitates learning autonomy. It was recommended amongst others that blended learning for instruction should be fully integrated, as this will sustain the learning autonomy irrespective of student's gender.

Keyword: *Blended learning; Students' learning autonomy; Facilitating conditions; Gender; and Pre-service teachers.*

Introduction

Blended learning can be described as a delivery approach, which combines online and conventional educational delivery method to facilitate meaningful and productive teaching and learning process. This instructional strategy encourages the creation of appropriate learning situation, interactivity, individualized learning approach and teaching-learning from teacher-centered to student-centered. Utilization of blended learning for instruction to enhance learning in among pre-service teachers may not be as intended due to various obstacles. Therefore, this study is necessary as it will determine students' learning autonomy and facilitating conditions on the utilization of blended learning among pre-service teachers in University of Ilorin, Nigeria and its implication for educational technology.

Case Study Background

University of Ilorin, Ilorin, Nigeria also known as Unilorin was established by a decree of Federal Military Government in 1975 and a Federal Government owned tertiary institution. The University is located in Ilorin, Kwara State. The ancient city of Ilorin capital of Kwara State is about 300 km from Lagos and 500 km from Abuja, the country's administrative capital. University of Ilorin, Nigeria commits itself to preparing experts in numerous areas of specialization through a variety of delivery methods such

as blended learning approach to cater for productive and pleasurable activity. To achieve this, the University trained and retrained her members of the academic on the use of google Apps for education in order to increase efficiency collaboration, engagement and updating the skills google classroom. The google classroom is one of the tools in the google Apps for education, which helps the lecturer to create and organize assignments, provide feedback efficiently and easily communicate with their students through a medium of blended learning in order to cope with the 21st century.

Literature Reviewed

Pre-service teacher training is an education, planned and guided before the trainee is certificated as a qualified teacher. They are trainee who partake in a pre-service training or a course of study, which they need to undergo before they begin teaching ((Amosa, Ogunlade, Ogunlade & Obielodan, 2016). In this research, the respondents were the final year educational technology pre-service teachers in the Department of Educational Technology, Faculty of Education, University of Ilorin, Nigeria. Pre-service training teaching commences with pre-service teachers considered as observers, thereafter, being guided, controlled and supervised, they are certificated as professional teachers (Allen & Wright, 2014).

Emergence of information and communication technology (ICT) has reformed the teaching-learning process and stakeholders' attitude towards educational technology, thus the change and development at the same pace has made the utilization of ICT to become inevitable in the field of educational technology. The transformation in the field of educational technology is determined by numerous factors. One of the most important among these factors is the educational technology lecturers' proficiency in the utilization of ICT and their level of engagement in blended learning for instruction.

The National Policy on Education (FRN, 2013) emphasized the need to integrate information and communication technology at all levels of education. Therefore, pre-service teachers consider the use of ICT essential to life. Most cannot do without being on the ICT tools even for a day mostly for the social reason, while others use it for assignment purposes or to get more knowledge. Ogunlade (2014) submitted that information and communication technology are the means of attaining, processing and distributing information by combining computers and telecommunication skills and procedures. The researcher stressed further that ICT can be used to offer anticipated results with little flaw or flawless, steady, reliable and interactivity in learning.

The achievement of technology in education is ultimately developed to advance the strategy in the utilization of ICT. Hence, the most commonly reason for using ICT in education has been to prepare the students to tackle future challenges where ICT tools improve the quality of education by increasing learners' engagement and motivation, facilitating the acquisition of basic skills and enhancing teacher education programme (Amosa, et al., 2016).

Educational technology pre-service teachers become more familiar with best practices and classroom application of information and communication technology instructional delivery method such as blended learning approach for meaningful and productive learning. Blended learning is an aspect of educational technology and means of integrating technology into the teaching and learning. It is the combination of online and face to face classroom interaction between the lecturers and undergraduate students, thus, it caters for individualized learning strategy and facilitates learners' autonomy. This will make educational technology practicable and meaningful to the students.

Teachers should be familiar with the technologies supported learning such as ICT facilities, which will increase students' engagement in learning (Amosa, et al., 2016). To achieve human proficiency in the utilization of ICT, institutions are required to afford training to numerous users; teachers, students, administrators, among others. Such training would ensure the resourceful and competent, use of ICT for all phases of the teaching-learning process (Oluseun, Bukunola, Isiaka & Olatunde, 2015)

Kintu and Zhu (2016) remarked that the planning for blended learning should focus on the various students' characteristics, study the capability of the students to be involved and their interaction with learning management systems for effective commencement of the blended learning. The response of students who are part of the participants is categorically essential to certify an effective application of any teaching and learning procedure (Shantakumari & Sajith, 2014)

Academically, male undergraduates are proficient in the repairing and utilization of ICT facilities than their female counterparts, thus the female undergraduates are interested mostly in the utilization of social media tools such as Facebook, WhatsApp, among others, which are mainly for fun. In addition, male undergraduates are competent in exploring knowledge that are required to be technologically proficient in the utilization of ICT facilities for learning while female undergraduates rely on the efforts being achieved by their male counterparts. Hou, Huang and Lin (2006) reported that females treated computers as device to complete a task, while the males considered computers as recreational devices. Male tends to earn lots of income with their mobile devices or at least be well informed while female tend to not explore at all or minimal. Male students' engagement and proficiency in the utilization of information and communication technology is the major reason for outperforming their female counterparts. Therefore, the male students are comfortable to work with any ICT tool such as blended learning why the female students are easily bored. There are conditions that facilitate the utilization of blended learning in teaching and learning. Internet access is one of the major obstacles facing the utilization of blended learning among lecturers and students for teaching and learning. In some cases, the network fluctuates and results to malfunction of blended learning strategy.

Purpose of the Study

The main purpose of this study was to determine students' learning autonomy and facilitating conditions on the utilization of blended learning among pre-service teachers in University of Ilorin, Nigeria and its implication for educational technology. Specifically, this study determined:

1. The influence of blended learning on students' learning autonomy
2. The facilitating conditions in the utilization of blended learning
3. The influence of blended learning on students' learning autonomy based on gender
4. The facilitating conditions in the utilization of blended learning based on gender

Research Questions

Answers were sought for the following research questions

1. What is the influence of blended learning on students' learning autonomy?
2. What are the facilitating conditions in the utilization of blended learning?
3. What are the influence of blended learning on students' learning autonomy based on gender?
4. What are the facilitating conditions in the utilization of blended learning based on gender?

Research Hypotheses

The following null hypotheses were tested for this study

Ho_1: There is no significant difference between male and female pre-service teachers' opinion on the influence of blended learning on students' learning autonomy

Ho_2: There is no significant difference between male and female pre-service teachers' opinion on the facilitating conditions in the utilization of blended learning

Methodology

The population for this study consisted of all final year pre-service teachers in the Faculty of Education, University of Ilorin, thus 150 final year pre-service teachers of educational technology from the Department of Educational Technology, University of Ilorin were randomly sampled for the study. The instrument for this study was researchers–designed questionnaire entitled 'students' learning autonomy and facilitating conditions on the utilization of blended learning among pre-service teachers. Descriptive survey research type was adopted, using the 4-point Likert Scale response modes: Strongly Agree (SA - 4), Agree (A - 3), Disagree (D - 2) and Strongly Disagree (SD - 1). Thus, four research questions and two research hypotheses were answered and tested using mean rating and t-test statistical tool respectively. The research questions one and two were answered by converting frequencies to mean, while research questions three and four were answered through the corresponding hypotheses one and two. Moreover, hypotheses one and two were tested using t-test to find out significant difference between male and female pre-service teachers. All hypotheses were tested at (0.05) level of significance.

Results

research questions were analyzed using mean and the research hypotheses were tested using t-test.

Demographic Information of Respondents

The distribution of final year pre-service teachers involved in the study based on gender showed that there was a difference in the distribution along gender lines. Table 1 shows that (83) 55.3% were male pre-service teachers in all the sampled respondents while (67) 44.7% of them were female pre-service teachers.

Table1:
Respondents based on Gender

Pre-service Teachers	Frequency	Percentage (%)
Male	83	55.3
Female	67	44.7

Research Question 1: What is the influence of blended learning on students' learning autonomy?

Table 2
Analysis of pre -service teachers' responses on the influence of blended learning on students' learning autonomy

S/N	Statement	Mean
1	Learning educational technology through blended learning encourages individualized learning approach	3.5
2	Little effort is expected of the lecturer if blended leaning strategy is adopted	3.2
3	Blended learning influences students' academic performance in educational Technology	3.5
4	Blended learning provides varieties of contents which help learners in concentration and long retention of information	3.3
5	I have better understanding of the subject matter when educational technology is taught using blended learning strategy	3.3
6	Blended learning is preferable to pure online learning for learners' self-development	3.3
7	I feel comfortable with learning educational technology through blended learning	3.1
8	Blended learning helps learners feel self- confident	3.4
9	Blended learning assists learners to learn and to progress at their own pace	3.3
10	Blended learning courses are more motivating to learners than traditional ones	3.3
	Grand Mean	**3.3**

Based on the results in Table 2, it reveals that educational technology pre-service teachers aware the blended learning approach and agreed that itsutilization enhances students' learning autonomy with the mean rating of 3.3, using 2.5 as the benchmark. There is an indication from the responses in items 1–10 that the use of blended learning affords individualized learning strategy and this learning approach has implication on learning educational technology.

Research Question 2: What are the facilitating conditions in the utilization of blended learning?

Table 3:
Analysis of pre-service teachers' responses on the facilitating conditions in the utilization of blended learning

S/N	Statement	Mean
1	Blended learning is a user-friendly approach	3.2
2	Lack of internet access discourages educational technology students from being active in using blended learning	3.3
3	In Unilorin, students' personal Gmail account cannot be useful for appropriate blended learning	2.9
4	Average lecturers are willing to adopt blended learning for instruction	3.1
5	Unilorin management prepares all it takes to adopt blended learning for instruction	3.0
6	Educational technology can be learnt adequately with blended learning approach	2.8
7	Lecturer's competency in the use of computer influences the adoption of blended learning for instruction	3.6
8	Lectures' gender influences the adoption of blended learning for instruction	2.6
9	Utilization of blended learning for instruction is clear and understandable	2.8
10	Utilization of blended learning approach is relatively easy for me	2.8
	Grand Mean	3.0

Based on the results in Table 3, it reveals that educational technology pre-service teachers opined that there are conditions, which facilitate the adequate utilization of blended learning approach. This is established with the mean rating of 3.0, using 2.5 as the benchmark. However, some factors are catered for while some such as items 2, 3, 4, 7 and 8 are needed to focused, for the avoidance being impeded the smooth conduct of its utilization.

Hypotheses Testing

Ho$_1$: There is no significant difference between male and female pre-service teachers' opinion on the influence of blended learning on students' learning autonomy

Table 4
Significant difference in the opinion of male and female pre-service teachers on the influence of blended learning on students' learning autonomy

Variable	No	Mean	Std. deviation	Df	t-value	Sig.(2-tailed)	Remarked
Male	83	3.2892	.35476	148	-.530	0.597	Accepted
Female	67	3.3224	.41298				

NS - Not Significance at $p > 0.05$

From Table 4, analysis established that the *t*-value = -.530, with *p*-value of 0.597 > 0.05 alpha level. This implies that the null hypothesis one, which states that there is there no significant difference between male and female pre-service teachers' opinion on the influence of using blended learning on students' learning autonomy showed no significant difference. Hence, the hypothesis one was accepted. Therefore, there was no significant difference between the opinion of male and female pre-service teachers on the influence of blended learning on students' learning autonomy

Ho$_2$: There is no significant difference between male and female pre-service teachers' opinion on the facilitating conditions in the utilization of blended learning

Table 5: Significant difference in the opinion of male and female pre-service teachers on the facilitating conditions in the utilization blended learning

Variable	No	Mean	Std. deviation	Df	*t*-value	Sig.(2-tailed)	Remarked
Male	83	2.9771	.52923	148	-1.660	0.099	Accepted
Female	67	3.0940	.25399				

NS - Not Significance at *p* > 0.05

From Table 5, analysis established that the *t*-value = -1.660, with *p*-value of 0.099 > 0.05 alpha level. This implies that the null hypothesis one, which states that there is no significant difference between male and female pre-service teachers' opinion on the facilitating conditions for the utilization of blended learning established no significant difference. Hence, the hypothesis two was accepted.

Summary of Major Findings

The results showed that:
1. The use of blended learning enhances students' learning autonomy among educational technology pre- service teachers.
2. Educational technology pre-service teachers indicated that there are conditions, which facilitate the adequate utilization of blended learning approach. However, according to the responses, there are factors need to put in place, to avoid being hindered the smooth conduct of its utilization.
3. There was no significant difference between male and female education technology pre-service teachers' opinion on the influence of using blended learning on students' learning autonomy.
4. There was no significant difference between male and female pre-service teachers' opinion on the facilitating conditions for the utilization of blended learning.

Implications/Contributions to Knowledge

The contributions of these findings to knowledge are based on the training of University of Ilorin academic members on the use of google Apps for education in order to increase efficacy, teamwork and engagement in the classroom. Thus, the application of google Apps for education affords the utilization of blended learning as an instructional delivery method among lecturers and students in the University. Similarly, blended learning, if encouraged to be fully incorporated into the teaching and learning, it would allow learning to be interactive, not gender biased, enhancing lecturer-students' collaboration and allows students to move at their own pace. Finally, teaching-learning will not be restricted to the conventional method, where if the teacher not in class teaching process cannot take place.

Discussion

The opinion of educational technology pre-service teachers on the influence of using blended learning on students' learning autonomy was examined in research question one. The opportunities derived from its utilization among others are; interactivity, individualized learning strategy and lecturer-students' collaboration. Thus, the result of the mean value established that educational technology pre-service teachers agreed that the utilization of blended learning facilitated students' learning autonomy. The finding of this study gives credence to Edwards and Knipe (2009), who asserted that blended learning is the integration of face to face and online teaching-learning process to offer a variety of learning experiences, which affords the students, interaction and construction of knowledge.

In addition, research question two examined the facilitating conditions in the utilization of blended learning. Therefore, the results of the mean value indicated that educational technology pre-service teachers reported that there are conditions, which facilitate the smooth conduct in the utilization of blended learning approach. Also, it was revealed that the blended learning is confronted with the difficulties, which could be hindrance to the appropriate conduct of the exercise. The findings corroborate with the submission of Shantakumari and Sajith (2014), who reported that students' satisfaction is the utmost feature for the accomplishment of blended learning. However inadequate students' satisfaction is the main hindrance to fruitful application of blended courses.

From the corresponding hypotheses, hypothesis 1 revealed that there was no significant difference between male and female educational technology pre-service teachers' opinion on the influence of using blended learning on students' learning autonomy, while the hypothesis 2 indicated that there was no significant difference between male and female pre-service teachers' opinion on the facilitating conditions for the utilization of blended learning. These findings support the submissions of Kintu and Zhu (2016), that gender and age are factors, which pose no obstruction on students' performance in blended learning. Also, no difference was remarked in the opinion of blended learning on the bases of gender (Shantakumari, & Sajith, 2014).

Conclusion

The role of ICT instructional delivery strategies such as blended learning for learning educational technology cannot be overemphasized. As such it has been revealed from this study that blended leaning has a strong link with educational technology. In addition, final year educational technology pre-service teachers opined and agreed that the utilization of blended learning affords the students individualized learning strategy and gives access to the students' learning autonomy. Finally, the educational technology pre-service teachers opined that there are conditions that facilitate or otherwise hider the utilization of blended learning, which can be tackled for the smooth conduct of learning through both the online and face to face classroom interactions.

Recommendations

Based on the findings of this study, the following recommendations are offered towards effective and efficient use of blended learning for the teaching-learning process. The findings from this study indicated that blended learning enhanced students' learning autonomy and affords individualized learning strategy, this study recommends that the institution should sustain the training of its academic members with the encouragement that the lecturers should fully inculcate blended learning as instructional delivery method.

Poor access to the internet due to low bandwidth subscription can be addressed by increasing the width being subscribed to by the institution. Training and re-training on the utilization blended learning should be extended to the students in order to improve their proficiency in the utilization ICT instructional delivery methods. Finally, educational technology pre-service teachers, irrespective of gender should be encouraged to be focused and put interest in the utilization of blended learning as instructional delivery method.

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EMERGING TECHNOLOGIES FOR 21ST CENTURY EDUCATION STRATEGIES FOR THE USE OF VIDEO MEDIATED INSTRUCTION

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Abstract

This paper explores the meaning of video as a means of instruction. It goes further to discuss the strategies for video-mediated instruction. The paper posits that video-mediated instruction as an offshoot of the technological growth of the 21st century, is not only useful for teaching but also for studying and learning in and outside the classroom, and is applicable in basic instruction, classroom enrichment, accelerated learning, distance education, global student collaboration, communication, and for professional development. Strategies for the application of videos in the classroom are also espoused and the benefits of using video for instruction explained. Some of the barriers of the adoption of video-mediated instruction comprising of technological, legislative, behavioural, and resource-based barriers in essence, are equally explicated. Recommendations that will lead to better understanding of good practices that can help improve success in incorporating video technologies in the learning process are finally proffered.

Key words: Video, video-mediated instruction, strategies for video-mediated instruction.

Introduction

It is essential to begin introduction of video at the very first level of instruction, which is in school because Technological growth is taking over as a formative influence in contemporary times. Preparing students for the 21st century isn't just about technology or skills. It will be all about creativity, cultural awareness, problem solving, innovation, communication, productivity, collaboration and exploration; with the ultimate aim of making the classroom as dynamic as the world around us. Technology can improve learning, teaching, and leading in the 21st century (Sinha, 2013). The Internet, mobile devices and social networking platforms such as *Facebook* and *Twitter* are technologies that have transformed the way we communicate and interact with each other, helping us traverse the boundaries of geography and time, and making us active participants in other people's destinies.

However, it is very unfortunate that we constantly have those moments in classroom where despite the hard efforts of teachers on students don't seem to be engaged in classroom activities (Gupta, 2017). The use of video in educational settings is applicable in not only teaching but also for studying and learning in and outside the classroom and is accelerating rapidly across all disciplines. Video is one tool in the media toolbox, lecture is one strategy on the instructional menu, and it is indeed a powerful medium. Video can be designed for presenting case studies, interviews, digital storytelling, student directed projects, and more (Zhang, Zhou, Briggs & Nunamaker, 2006).

Video is an electronic medium for the recording, copying, playback, broadcasting, and display of moving visual media. Video can be carried on a variety of media, including radio broadcast, tapes, DVDs, computer files etc (Wikipedia, 2017). Video in particular is often attractive as a means to capture lecture content and present direct instruction. Of all the technological components involved in the learning experience, it is often the most visible and the most resource intensive (Brame, 2015). It is easy then to assume that it will be the most impactful.

Historical development of video mediated instruction

In the past fifty or so years, globalization, technology, and demographic shifts have dramatically redefined economic development, business, and societies. There is intertwining of economies as never before. The United States, the European Union nations, and other players have contributed to a complex web of economic interdependence, while countries like Brazil, Russia, India, and China (BRIC nations) have emerged as significant engines of growth.

Television, both broadcast and cable, has been an effective combination video and audio distance education medium. Individuals or groups can receive video and audio instruction at remote locations using the national network of Public Broadcasting Stations (PBS) and/or participating cable systems. Additionally, microwave transmission of video signals provides access to non-wired viewing sites. Microwave broadcasting can provide local areas with video instruction that may not find a place in the PBS line-up.

Microwave is particularly useful for transmission of video from point to point to relay TV signals for rebroadcast or into closed circuit systems. When applied to distance learning, television broadcast, regardless of the method, provides a better approximation of real-life instruction. Unfortunately, such broadcasts do not provide the opportunities for interactivity characteristic of the live classroom.

Videoconferencing partially addresses this problem. Ward (1990) suggests that two-way video such as used in interactive video conferencing provides the means to overcome the passivity of more traditional one-way video. Videoconferencing requires that both the transmitting and receiving site be set up with monitors and video cameras. Each site can thus view and hear the interaction at the other site or sites. The constant presence of both video and audio from all locations enhances the learning environment (Hannu, 1990). From a distance education perspective, full video conferencing is highly desirable as a delivery mode. Delivery of courses now can occur in a manner as close to live instruction as possible. However, even if simulating traditional instruction is now possible, videoconferencing still suffers from some of the location and time constraints typical of traditional instruction. Students must be at a given location at a given time in order to participate. This therefore neutralizes one of the significant advantages offered by a distance education program—flexibility. Video as a change agent in the classroom has undergone a unique cycle of adoption over time (see Figure 1.1). Use of broadcast television and films first progressed sparingly, primarily as out-of-the-classroom forms of enrichment (assignments to supplement class work).
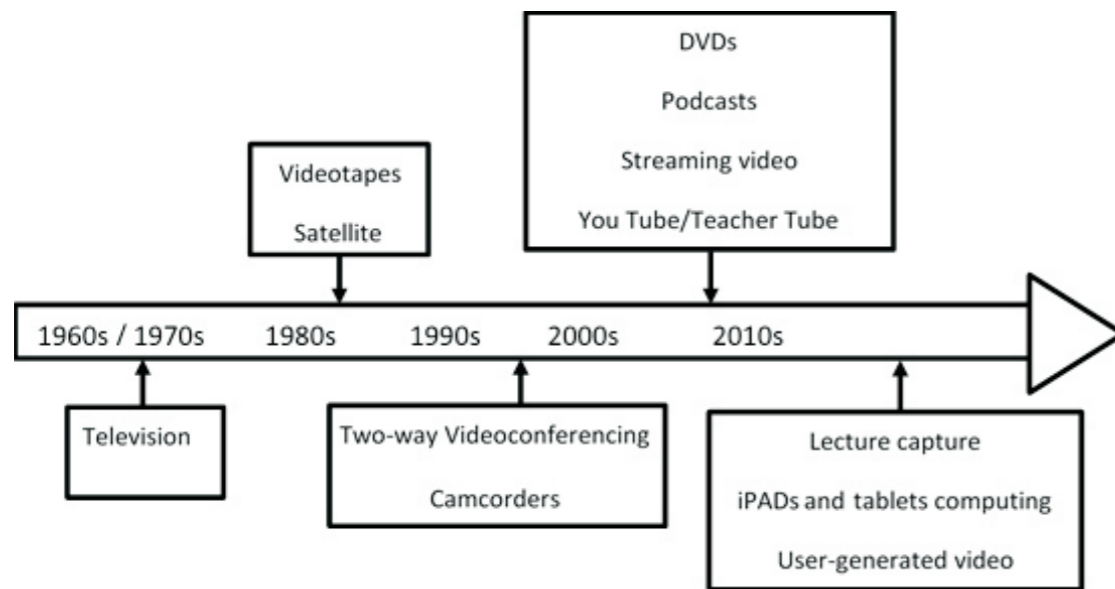
Figure 1.1: General Timeline for visual technologies in the classroom.
Source: Greenberg and Zanetis (2012:11)

In the past 55or so years, there has been a shift in viewers' behaviour. Viewers have moved away from being passive spectators absorbing the images and content displayed on the screen (according to the reactive theory of viewing of Winn, 1977) and have become active observers applying individual experiences and understanding to their viewing (according to the cognitively active theory of Anderson, 1983) as cited in Greenberg and Zanetis (2012:5).

Beginning in the 1980s several new forms of video came along: Laserdiscs and the video home system (VHS) videotape were popular methods of enriching the classroom with content, whatever the subject matter. Additionally, satellite delivery, which had already been available, became a more common method of delivering instruction in distance education networks. Camcorders made it possible for educators and students to begin to create their own analogue content, although the means for broadly distributing that content did not yet exist. (A type of lecture capture, a time-consuming and costly manual distribution of analogue or digital content (audio or audio/video) has been common at some universities in the past.) In the first decade of the 21st century, the connection of classrooms to the Internet was so sufficient to permit the distribution of digital content globally. Within a few short years, *YouTube* came to dominate the notion of how to bring video into the classroom for enrichment—and how to empower learners to create their own content. Devices like webcams and smartphones also came of age around the same time.

Podcasts have brought the ability to create and deliver discrete audio files for educational purposes—and enhanced podcasts added video to the equation. DVDs brought the ability to build upon use of VHS resources, enabling greater depth of material because of the ability to add content digitally. The convergence of broadcast video and streaming video has enabled video to be delivered over multiple networks and to multiple types of devices.

Video cassettes have added another dimension to the use of television in education; it provides the simple medium for combining video and audio into a single distribution package. The packaged version of televised courses (telecourses) answer the need for flexibility in times and location of presentation. Videocassette playback units are required equipment if the learner is to take instruction from this medium. Videodiscs provide a new packaging for video/audio instruction. Videodiscs, like their music equivalents, compact discs, are easy to use and are very durable. Videodisc technology also provides more opportunity, using custom programs by educators, to create highly interactive instruction individualized to suit the learner.

Ways of delivering video for instruction

There are three primary ways to deliver video for instruction (Greenberg & Zanetis, 2012:12- 13), namely:
a) On-demand video, whether locally based or delivered-on-demand via the Internet.
b) One-way video, which may be time-ruled, packaged, broadcast TV, on-demand streaming video, or real-time, instructor-based satellite TV.
c) Two-way interactive video, which includes interactive videoconferencing, compressed interactive video (CAVE), video teleconferencing (VTC), and telepresence.
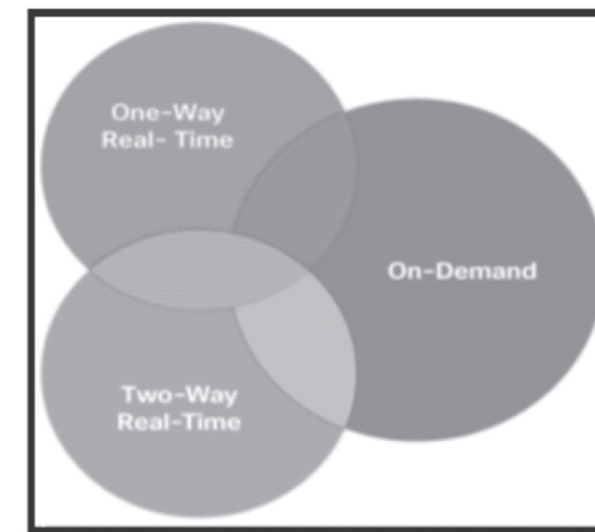
Figure 1.2: Three major groupings of video for education.
Source: Greenberg and Zanetis (2012:13)

On-demand and *one-way* video technologies are characterized by being able to reach large audiences but offer relatively low interaction, whereas *two-way interactive video* technologies are characterized by their ability to offer higher levels of exchange and interactivity but reach out to more targeted or smaller audiences. As Figure 1.2 suggests, three groupings often function individually as media for teaching, while also at times functioning in tandem. The media through which video is accessed have evolved over time, based on a combination of cost and value equations (how affordable the technologies are) and pedagogical purpose (what the technologies can accomplish). Table 1.3 provides examples of what is included in each video technology category.

Table 1.4:
Instructional video media

Instructional video media	On-demand video	One-way real-time video	Two-way real-time video
DVDs, VHS, Laser disc	X		
Broadcast content		X	
YouTube clips/enhanced podcasting/VODcasting	X		
Streaming		X	
Lecture capture	X	X	
Satellite		X	X
Interactive videoconferencing			X

(From Greenberg & Zanetis, 2012:14)

Application of video to instruction
Video is applicable in not only teaching but also for studying and learning in and outside the classroom. Zhang, Zhou, Briggs and Nunamaker (2006) list a sample of how video is incorporated into each major application area:
Basic instruction: In language classes by using web or DVD-based audio/video clips of speakers, visual or auditory stimuli are associated allowing better comprehension and expansion of vocabulary. Other examples include the use of video in history and geography lessons where students can bring a subject to life, stimulate their ability to recall facts and events, and experience places they would not otherwise experience.
Advanced instruction: Thomsen, Bridgstock and Willems (2014), teacher survey reported that the use of video for instruction of science subjects like physics, mathematics, astronomy and biology allows students to expand their understanding of complex concepts by strengthening the links between abstract ideas and practical applications. Videos are uniquely suited for taking students on 'impossible' field trips, such as a trip inside the human body, and can illustrate complex, abstract concepts through animated 3D images and show experiments that are not possible in class.
Classroom enrichment: Video gives students the opportunity to travel to remote places outside the classroom walls without leaving school.
Accelerated learning: Many rural and even urban secondary schools lack instructors in certain areas. One-way streaming blended with other online methods of communicating is one of several ways of ensuring that learners can take the higher-level courses they need.
Distance education: Thanks to the use of video, distance-learning programs have made courses and lectures accessible to populations in remote areas and to students with disabilities or with physical impairments.
Global student collaboration: Research shows that it is through interaction with other peers that deeper and more sophisticated learning can occur. Video technologies can help students connect with peers located in different campuses and in different countries so that they can interact with different cultures, exchanging information and learning from each other.
Communications: It is practicable to use video to stream content at campus public areas such as cafeterias, auditoriums, and stadiums. That content may be purely instructional or a blend of entertainment and information.
For professional development: Primary and secondary school educators have strict requirements for professional development. Often, either they can meet these requirements through online tutorials with video components, where they can see live instructors or review previously recorded sessions at their own pace. Recorded lessons also help 'pre-service' teachers to become familiar with classroom settings before starting their teaching practice. Increasingly, busy educators are also taking advantage of recorded seminars and online virtual communities when they miss the 'live' version.

Benefits of using video for instruction
Video, in its various guises and modalities (broadcast television, Laserdiscs, camcorders, videocassettes, DVDs, streaming video, satellite video, webcams, videoconferencing, and lecture capture) has been a strong enhancer of instruction (Sloan Consortium, 2010). It appears poised to be another powerful change agent adding value to the learning process while at the same time enhancing the quality of the learning experience. Teachers using subtitled video as a teaching aid in the classroom gain many benefits including greater student interest and improved reading and literacy skills. There is substantial research promoting the use of video in the classroom as a dynamic resource for supporting curricula. Zane Education (2017), outline below some benefits:

1. Video creates an experience: Teaching with the voices from the past by introducing students to great historians, political figures and famous people who lived centuries ago, envision the classroom in which children hear the cry of a nearly extinct species and see the colours and hear the sounds of animals that thrive only in a remote wilderness half way around the world. The benefits of using video in education includes providing a sensory experience that allows concepts and ideas to actually become an experience and come to life as students are guided through each adventure.
2. Video as a flexible teaching medium: Having the ability to stop, start and rewind is absolutely invaluable. It provides the option to stop each video and challenge students to predict the outcome of a demonstration, and elaborate on, or debate a point of historical reference.
3. Effectively using video in the classroom: Research has demonstrated that the most effective way to use video is as an enhancement to a lesson, or unit of study. Video should be used as a facet of instruction along with other resource material available to you for teaching a particular topic.
4. The value of essential video support tools: Video should be supported by a selection of other tools and resources that enable each topic to be fully investigated and explored. The use of online video should be supported by the use of an interactive word glossary, dictionary, thesaurus and an online encyclopaedia. Access to lesson plans specially written to be used in conjunction with the video help not only to minimize lesson preparation time, but also help provide valuable additional learning activities and projects that further enhance the use of the video as an educational aid.

Barriers to the adoption of videos for instruction
However, challenges do exist for wider adoption of video in the classroom. These challenges are:
1. Technological barriers: Some institutions find on-demand streaming video to be a challenge due to access to the technology, especially when bandwidth is lacking—an issue frequently found in rural areas. Others cannot afford the bandwidth from their service providers necessary to deliver the quality of service (QoS) expected by their teachers and learners.
2. The way students and teachers use the technology and the fidelity of the implementation might hinder success. Leadership, teacher proficiency, professional development, fit with curriculum, school culture, and pedagogical approaches, and to some degree by levels and types of technology access determine the fidelity of technology implementation in a school (Metiri Group, 2009).
3. Equipment failures and reliability also represent significant barriers to adopting video or any other type of technology in the classroom. Technical glitches might stem from the hardware as well as the software, and teachers do not typically have the background to troubleshoot quickly when problems arise. Continuous technical problems with the equipment might jeopardize the flow of information and the flow of the class, creating frustration and reducing the teacher's motivation to use the technology (*ibid*).
4. Legislative barriers: Technologies in some countries must meet requirements of 'special' needs of learners. In other cases, there might be an absence of a science and technology policy or even a deficit in government funding directed towards the implementation of new technologies in the classroom. Legislatures might fail to grasp the benefits of bringing technology to education, thus neglecting essential investments.
5. Behavioural barriers: Behaviours, attitudes, expertise, and preconceived ideas can become important barriers when adopting any new technologies or teaching methods.im the views of Polin (1992), there are four stages in the adoption and integration of multimedia technology into the classroom namely:
a) The comfort zone, when the instructor is acquainted with the equipment and its operation.
b) Disjointed instructional use: This happens when the instructor is able to work with the technology, but is still unable to integrate it with his or her instructional goals.
c) Integrated instructional use, when the teacher is able to integrate the technology into his instructional plans, but the technology still drives the plan.
6. Transparent integration, when the focus moves from the technology to the content and instructional strategies. At this stage, the technology is no more than one of many tools used by the teacher to accomplish the educational goals. Some educators are reluctant to 'teach' to a camera and feel at a disadvantage *vis-a-vis* their students regarding proficiency in technology.
7. Faculty Resistance. This is especially the case among some post-secondary educators who lack appreciation of on-demand technologies, particularly if they believe that intellectual property and digital rights issues may be at play (Dey, Burn & Gerdes, 2009).

8. Resource-based barriers: Some studies find the percentage of high-quality educational TV programs to be low (Metiri Group, 2009). This of course, depends on the subject matter and educational level discussed. For example, textbook publishers have become more media savvy in recent years tying together textbooks (digital or print), rich educational media, video, and Web 2.0 capabilities.

9. Success Factors: Design and pedagogy are factors that determine the effectiveness of video in education. Many educators lack an understanding of when and how to apply video (Lambert & Cuper, 2008).

Recommendations

Video should be supported by a selection of other tools and resources that enable each topic to be fully investigated and explored. Institutions should post classes for public consumption online to enable more educators accept streaming lecture capture (as an example) as a net positive for professors, departments, and institutions, and also focus should be given to training, enhanced content, or additional infrastructure to rectify the problem of weak application of the technology.

Teachers should work with school's culture, vision, resources, and guidelines for teaching or often have to adjust their own behaviours to improve interactivity. They also dedicate more time to class preparation, research, and coordination than when they give traditional lectures.

The instructor may need additional time not only to get trained in the technology and familiarize himself with the equipment, but also to identify the appropriate place of the session(s) within the curriculum, research the appropriate content to use, plan for the recording of the lesson, and develop supporting materials such as hand-outs, slides, and further reading notes. For certain subjects (such as mathematics, physics, and chemistry among others), teachers need to allot additional time for subsequent demonstrations and exercises that facilitate and consolidate the information transmitted through video.

In the case of distance learning, instructors also need to take into account additional factors such as accessibility of supporting materials and extra time and interaction mechanisms for addressing follow-up questions, as well as engagement strategies that keep students motivated once the session has finished.

Conclusion

Successful adoption of video technologies for instruction is a process that requires time, a clear vision of education transformation, proper integration with curricula and alternative methodologies, as well as the continuous engagement and support of teachers, learners, administrators and parents.

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THE MODIFIED TECHNOLOGY ACCEPTANCE MODEL FOR UNIVERSITY LECTURERS USE OF COMPUTER-BASED TEST FOR ASSESSMENT

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Abstract

Information and Communication Technology (ICT) is an inevitable tool for assessment in Nigerian Universities due to the present student population. However, its' acceptance is limited. Lecturers' in Nigerian universities have different technology acceptance decision as compare to common users. Hence, understanding the lecturers' technology acceptance is essential for the use of computer-based test in Nigerian Universities. This study evaluated the factors influence technology acceptance decision among lecturers' in Nigerian universities. A modified Technology Acceptance Model has been proposed with four independent variables: lecturer's attitude, perceived usefulness, perceived ease of use and perceived credibility. Questionnaire was distributed to 425 lecturers from four federal universities in Nigeria. Result of multiple regression analysis showed all the independent variables have a significant relationship with the lecturer's behavioral intention of IT usage (computer for assessment). The proposed model fitness is confirmed with coefficient of determination (R^2) of 82.5%. The proposed model provides a platform to enhance understanding and direction to conceptualize lecturers' technology acceptance.

Keywords: Information and Communication Technology, Technology Acceptance Model, Nigerian Universities, Lecturers', Computer-Based Test.

Introduction

Educational system has been influenced by a rapid change in Information and communication technology (**ICT**) as it is increasingly used in teaching and learning. The use of **ICT** in educational context and environment focused mainly on the application of new technologies and it serves as a tool for supporting the various components of education (Joshua, Joshua & Ikiroma, 2016). Such examination processes also known as learning assessment. The use of ICT for assessment is known as Computer-Based Testing (CBT). CBT means the candidate sits in front of a computer and the questions are presented on the computer monitor and the candidate submits the answers through the use of keyboard or mouse. CBT can also be referred to as Computer-Based Assessment.

In Nigeria Universities, paper based testing is still very predominant though some universities have embraced the use of Computer-based Testing and they are still improving on the usage as they continue to make available the necessary facilities (Olafare, 2014). Universities like University of Ilorin and University of Lagos whose number of students increased drastically in the past few years and the conventional examination method became time consuming in terms of evaluation and assessment. The solution of examination in large classes of students is an automated testing system and this has been introduced in Nigerian Universities since 2008, with the primary aim of addressing students' population and venue during examination.

Information on current and expected future uses of computer-based tests is been revealed by Research and evaluation specialists. Lecturers do administer or use computer-based tests for providing information about interpreting test scores and using the scores appropriately. Also, students prepare appropriately for computer-based tests. Therefore a key challenge for any university is getting computer-based test into the hands of lecturers and equipping the lecturers to use the technology (Gates, Moore, Oberlin, Rusiecki & Wascom, 2000). Stefl-Mabry (1999) declared that an understanding of how and why users either accept or reject new technologies is paramount to the issue of effective integration of a technology into organizational functions.

Statement of the Problem

Since the inception of University Education in Nigeria, the conduct of examinations as well as the process of producing results has been fraught with various problems leading to inability to release results on time, inability of some students to get their results and several incomplete results. These problems have become embarrassing to universities with comments like delay in the release of examination results and failure to graduate students (Aborisade, 2010). The problems associated with conventional methods in the university made National Universities Commission (NUC) recommended the introduction of management information system to Nigerian universities in 1987 to alleviate the problem of data collection, information processing and storage in Nigeria universities (Mejabi & Raji, 2010).

The improvement led to the total adoption of technology into the university system. Information and Communication Technology (ICT) is an inevitable tool for assessment in Nigerian Universities due to the present student population. However, its' acceptance is limited by lecturers of the Universities. Lecturers' in Nigerian universities have different technology acceptance decision as compare to common users. Hence, understanding the lecturers' technology acceptance is essential for the use of computer-based testing in Nigerian Universities as the factors that drive the technology acceptance decision making of lecturers in Nigerian Universities are still not clearly and fully identified. This study evaluated the factors that influence technology acceptance decision among lecturers' in Nigerian universities using a modified Technology Acceptance Model with six independent variables: lecturer's attitude, perceived usefulness, perceived ease of use, and perceived credibility.

Research Hypotheses

Ho_1: There is no significant relationship between the lecturers' attitudes and their behavioural intention of CBT usage.
Ho_2: There is no significant relationship between the lecturers' perceived credibility of CBT and their behavioural intention of CBT usage.
Ho_3: There is no significant relationship between the lecturers' perceived ease of use and the behavioural intention of CBT usage.
Ho_4: There is no significant relationship between the lecturers' perceived usefulness of CBT and the behavioural intention of CBT usage.

Literature Review

Nigeria University Education and Computer-Based Test

Educational system has its capability to continuously serve the stakeholders within the immediate environment. Education is fundamental and basic to human and the development of the society that makes people to be self-reliant. The development of a society has been associated with the literacy level of its citizens, which helped in the establishment of universities globally with the mission of promoting the life of the mind store and transmit specialized knowledge, sophisticated enterprise, higher forms of culture and ethical basis of conduct (Obielumani, 2009).

According to Ehiametalor (1999), university is the highest level of schooling and its natural characteristics make it different and unique from any other institution in the world. Universities can also be described as a place where professionals of diverse disciplines can follow lines of inquiry determined individually and collectively, and not dictated by anyone else, on either ideological or practical grounds (Brickel, 1975). University alone make inquiry and make teaching to constitute creativity so that knowledge and insight of scholars and the methods by which they gained them are shared with students. Privateer (1999) stressed that universities are complex cultures that make things in order and manage information and are constituted as dense information networks held together by ideological and technological strands. Osagie (2001) asserted that University education is set for objectives such as, instruction in skills, promotion of the general powers of the mind, advancement of learning and transmission of a common culture as well as meeting the needs of the economy. In line with this, therefore, the universities ensure that the degree programmes are of minimum standards that will ensure that students acquire appropriate skills, level of competency and overall development that will enable them fit adequately into the world of works in the larger society.

Nigerian university system has grown considerably since its modest beginnings with the establishment of the first University, (the University of Ibadan) as a College of the University of London in 1948. The Nigerian University System (NUS) has expanded systematically over the years with increasing participation of government and the private sector, such that today, Nigeria has one hundred and twenty three universities with a total student enrolment of about 1.2 million in the conventional face-to-face mode and some 100,000 students in the Open and Distance Learning (ODL) mode (Okojie, 2009). According to Urah (2005), University education in Nigeria has undergone a series of rapid expansion since its introduction in 1948. The total student population of Nigerian university students has grown from a mere 1,395 in 1960 to 40,000 in 1976 when the Universal Primary Education (UPE) scheme was introduced. It rose to 172,000 in 1988 when the first group of graduates from the new 6-3-3-4 system of education was first enrolled in the universities.

By the year 2000, the population stood at 448,230, and it is projected that by the end of 2005, National Open University would accommodate about 90,000 students. National Universities Commission (NUC) was established as an administrative unit in the cabinet office in 1962 and charged with ensuring orderly development of university education in Nigeria, maintenance of its high standard and ensuring that it is adequately funded. The NUC became a statutory body by virtue of Act No. 1 of 1974, as a parastatal under the federal ministry of education concerned with the maintenance of high standards of quality in Nigerian Universities; government introduced system-wide accreditation of their academic programmes by provisions of Act No 16, 1985. This law empowers the NUC to lay down minimum academic standards for all the academic programmes taught in Nigerian universities and also to accredit them (Okojie, 2009)

To establish and maintain high quality standards, the universities and the NUC have a shared responsibility in addressing the following key areas, according to Aborisade, (2010).
1. Minimum academic standard
2. Accreditation
3. Carrying capacity and admission quota
4. Visitation
5. Impact assessment
6. Research and development
7. Publications and research assessment
8. Structures, infrastructures and utilities

Universities in Nigeria are making use of all the available opportunities of ICT in the country which has been helping in most of the institutional practices and processes. One of the uses of ICT for assessment in the university is the Computer-Based Testing (CBT). It is a method of administering tests in which the responses are electronically recorded, assessed, or both. Universities are increasingly adopting computer based test to replace the paper-based test for academic assessment of students (Best, 2002; Ricketts & Wilks, 2002; Bertolo & Lambert, 2007; Sieber & Young, 2008). This rapid adoption is due to the numerous advantages the schools derived from CBT over the paper-based test considering the large population of students. Some of the advantages include: increased delivery, administration and scoring efficiency, improved test security, consistency and reliability, faster response rate to mention a few (Riku, Laurif & Ari, 2001; Ricketts and Wilks, 2002).

Theory of Reasoned Action (TRA) Model

The Theory of Reasoned Action (TRA) has two factors that affect behavioural intentions, attitude towards behaviour, and subjective norms. Ajzen and Fishbein (1980) Theory of Reasoned Action (TRA) is a model developed to predict and explain a consciously intended behaviour. The model proved the success in predicting a large variety of different behaviors, like the prediction of computer use in assessing students (Davis, Bagozzi,, &Warshaw, 1989). Also an important concept underlying TRA is the assumption of specific, clearly defined behaviour, so that a person can decide at will to perform the behavior or not (Ajzen& Madden, 1986). The Theory of Reasoned Action asserts that the behavioral intention (BI) is a function of a person's personal attitude (A) and subjective norm (SN) regarding the behavior (Davis et al. 1989, Ajzen and Fishbein, 1980). TRA shows that the intention to perform is determined by an individual's attitude toward performing the behavior and subjective norm held by the individual. An organisation or individual may find their attitudes more important when deciding whether to use the computer for assessment or for instruction. It shows that the intention to perform is determined by an individual's attitude toward performing the behavior and the subjective norm held by the individual. Each individual may place a different level of importance on attitudes and subjective norms, depending on the situation and other influences. A group or an individual may find their attitudes more important when deciding whether to use the computer for assessment or instruction. Theory of Reasoned Action states that "the more a person perceives that others who are important to him think he should perform a behavior, the more he will intend to do so" (Ajzen & Fishbein, 1980). Theory of Reasoned Action has been successfully applied to investigate behaviours (Bagozzi, Wong, Abe, & Bergami, 2000).

Diffusion of Innovation Theory

Diffusion of innovation Theory is a hypothesis that outlines how new technological and other advancements spread throughout societies and cultures, from introduction to wider-adoption. The diffusion of innovations theory seeks to explain how and why new ideas and practices are adopted, with timelines potentially spread out over long periods. The way in which innovations are communicated to the different parts of the society and the subjective opinions associated with the innovations are important factors on how quickly diffusion–or its spreading–occurs.

Diffusion of innovation Theory has two major variables: innovation which is an idea practice or object that is perceived new by an individual or an organization for adoption (Rogers, 1995) and diffusion which is the process by which an innovation is communicated through certain channels over a period of time in a social system (Rogers, 1995). Diffusion of innovation Theory argued that potential users make decisions to adopt or reject an innovation based on beliefs that they form about the innovation (Agarwal, 2000). The diffusion of innovation theory refers to the process that occurs as people adopt a new idea, product, practice, philosophy. As these early innovators spread the word, more and more people become open to it which leads to the development of a critical mass. The innovative idea or product becomes diffused amongst the system until a saturation point is achieved. Rogers distinguished five categories of adopters of an innovation as: innovators, early adopters, early majority, late majority, and laggards.

Technology Acceptance Model

The Technology Acceptance Model (TAM) has since become one of the most widely accepted models of technology adoption. TAM is an adaptation of Fishbein and Ajzen's (1975) theory of reasoned action (TRA), in which TRA's attitudinal determinants, derived separately for each behavior, are replaced with a set of two variables perceived ease of use and perceived usefulness McFarland, & Hamilton (2006). TAM suggests that an individual's perceived ease of use and perceived usefulness of a particular technology determine the individual's behavioral intention which in turn determines the acceptance and use of the technology. TAM posits that the impact of other external variables is fully mediated by the perceptions of ease of use and usefulness. Lee, Kozar and Larsen (2003) found that the impacts of perceived usefulness and perceived ease of use of technology adoption and usage remain consistent and significant across educational different settings.

Researchers have used different models to explain the acceptance and the intension to use computer assessment system (e.g. Teo, 2009). Perceived Usefulness and Perceived Ease of Use from TAM has been used in many studies regarding computer assessment system (e.g. Yi & Hwang, 2003). This study has a conceptual framework adapted from Technology Acceptance Model (TAM) proposed by Davis, Baggozi and Warshaw (1989). TAM is one of the most important models for understanding adoption of information technology. The model works as intended with attitudes and subjective norms proven to determine behavioral intention, to be a good indicator of behavior. Therefore, Technology Acceptance Model (TAM) is based on the theoretical beliefs-attitude-intention, behaviour causal relationship initially established by Theory of Reasoned Action. Technology Acceptance Model (TAM) is commonly used to explain and predict the acceptance of technology. Technology Acceptance Model is designed to apply to computer usage behavior (Davis, Bagozzi, &Warshaw, 1989).

Behavioural Intention is a measure of the strength of one's intention to use the computer. Attitude is defined as an individual's positive or negative feelings (evaluative affect) about performing the target behaviour. Subjective norm refers to the person's perception that most people who are important to him think he should or should not make the use of the computer (Fishbein&Ajzen, 1975).

Based on the belief–attitude–intention–behaviour relationship from Fishbein and Ajzen (1975), Davis proposed TAM for explaining and predicting user acceptance of system. The major contribution of TAM is to measure development with two key beliefs: perceived usefulness and perceived ease of use. Davis (1989) defined perceived usefulness as "the degree to which individual's believes that using a particular system would enhance his or her job performance," and perceived ease of use as, "the degree to which individual's believes that using a system would be free of effort".

Modified Technology Acceptance Model

Based on the review of the pros and cons in the previous theoretical models, Olafare (2014) proposed a revised technology acceptance model by taking the consideration of the use of computer-based testing by lecturers of Nigerian Universities. This study targeted 850 university lecturers in Nigeria to examine their perception of the use of computer-based testing. One new construct of perceived credibility was added to examine lecturers' perception of the use of computer-based testing. With the reason, it is important to understand the impact of lecturers' essential characteristic toward the technology acceptance. On the other hand, technological context is to determine whether the perceived characteristic of the technology by lecturers affect the technology acceptance. Olafare and Fakorede (2016) suggested the two major variables in Technology Acceptance Model (Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)) with the added construct of Perceived Credibility (PC) as the constructs for technological perspective factors. However, in the findings, PEOU did show a lower significant impact towards the acceptance of CBT. The findings of previous studies which found that there is a need for the TAM model to be modified in order to provide better Goodness of fix result (Annie & Choy, 2013). This present study further modified Technology Acceptance Model (TAM) to examine the factors that influence technology acceptance decision among lecturers' in Nigerian universities.

Proposed Conceptual Model

Based on previous literature and the conceptual framework of Olafare (2014), the proposed CBT acceptance model for lecturers' in Nigerian University in this study was as in Fig. 1. With the proposed model, this study aims to investigate the factors, which influence the lecturers' acceptance of computer-based test in Nigerian Universities.
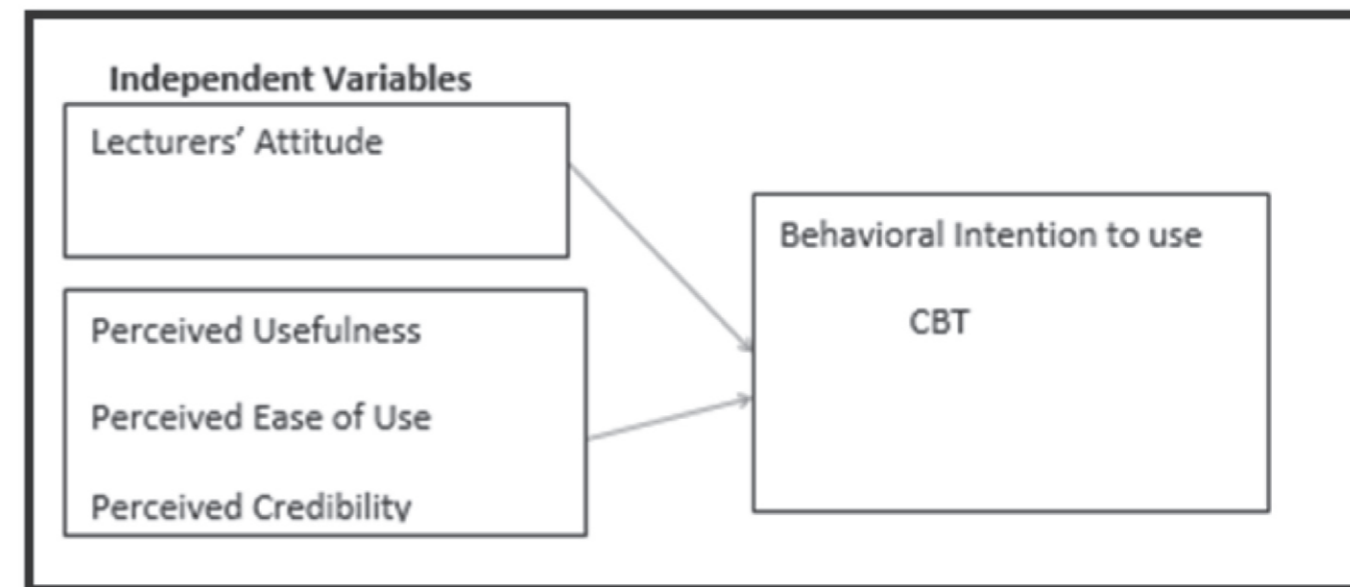
Fig. 1: Proposed modified technology acceptance model for University Lecturers'

Dependent Variables

Behavioural Intention to use CBT: Behavioural Intention is a measure of the strength of one's intention to use the computer. In this study, the behavioral intention to use CBT was chosen to be the dependent variable for the conceptual framework. Among the prior studies such as in TAM and TRA studies, the behavioral intention is mainly adopted as the dependent variables. According to Fishbein and Azjen (1975), the best predictor of an individual's behavior is to measure his or her intention to perform the behavior. This is also supported Chau and Hu (2002); Tan & Teo; 2000). Behavioral intention as the dependent variable is to avoid the retrospective analysis and reduce down the response bias where the respondents might not able to recall their past adoption.

Independent Variables

Lecturers' Attitude

Technology Acceptance Model suggests attitude to be a direct predictor of the intention to use technology as it can also predict the actual usage of the system. Technology Acceptance Model suggests that when users are presented with a new technology, a number of factors influence the decision about how and when it will be used. According to its theoretical postulates in figure 5, system usage is determined by individual behavioural intention to use a system; these are jointly determined by individual attitude toward a system use (*Davis,* et al. *1989).*

Attitude is defined as an individual's positive or negative feelings (evaluative affect) about performing the target behaviour. Subjective norm refers to the person's perception that most people who are important to him think he should or should not make the use of the computer (Fishbein & Ajzen, 1975).

Perceived Usefulness: This is taken directly from *Davis,* et al. *(1989) and refers to* a positive attitude to 'a system, so that the person will want to use the system again (Davis, 1989). The importance of perceived usefulness has been widely recognized in the field of education as regard testing of student. The usefulness of computer- based test in this study was determined by how effective and productive the system is when it comes to examination environment and control over examination (Olafare, 2014, Fakorede & Olafare, 2016).

Perceived Ease of Use: This is also taken directly from *Davis* et al. *(1989) and refers to* the degree to which an individual believes that using a system would be free from effort. The easier users perceive the computer-based test to be, the more they tend to form positive attitudes toward using the computer-based test in some form in the future, or using it continuously. The perceived ease of use is measured by its convenience, timeliness and access (Olafare, 2014, Fakorede & Olafare, 2016).

Perceived Credibility (added construct)*: This is concerned with the* confidence and consequences associated with a user's actions. Perceived credibility is the degree to which users feel the certainty and pleasant consequences of using computer-based test. This can be measured by the perception of users (lecturers and students) in terms of the outcome of using computer-based test(Olafare, 2014, Fakorede & Olafare, 2016).

Methodology
This study is a descriptive study of the correlation type. The population for this study are lecturers from four federal Universities in Nigeria (University of Ilorin, Ilorin; University of Lagos, Akoka; University of Ibadan, Ibadan; and Federal University of Technology, Minna). A total 425 lecturers were sampled. This study chosen the probability sampling technique where all elements within the population are considered and have an equal chance to be selected. A researcher designed questionnaire was used to collect data for the study. Data was analysed using Multiple Regression.

Results
Table 1:
Descriptive Analysis and Inter-correlational Matrix of Lecturers' use of Computer Based Test for Assessment

Variables	Mean	SD	N	Behavioural Intention	Attitude	Perceived Credibility	Perceived Usefulness	Perceived Ease of Use
Behavioural Intention (BI)	31.57	3.70	425	1.00	.12	.76	.45	.74
Attitude (A)	19.95	3.53	425	.12	1.000	.55	.44	.21
Perceived Credibility (PC)	58.58	7.70	425	.76	.55	1.00	.57	.33
Perceived Usefulness (PU)	38.33	5.72	425	.45	.44	.57	1.00	.24
Perceived Ease of Use (PEOU)	56.88	7.72	425	.74	.21	.33	.24	1.000

Table 1 reveals the Behavioural Intention to use computer-based Testing was significantly positive with Attitude, Perceived Credibility, Perceived Usefulness and Perceived Ease of Use. It was revealed that there was a strong correlation with BI and PC (r= 0.762) and BI and PEOU (r= 0.74) as it was above the 0.60 guideline suggested by Fraenkel and Wallen (2003). However, the correlation that exist between BI and PU (r= 0.45) and A (r= 0.12) are weak.

Table 2: Result of Multiple Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Result
		B	Std. Error	Beta			
	(Constant)	14.259	1.418		10.053	.000**	
1	ATTITUDE	-.132	.051	-.126	-2.607	.001**	Accepted
	PC	-.020	.026	-.042	-.776	.000**	Accepted
	PEOU	.284	.032	.439	8.927	.000**	Accepted
	PU	.180	.020	.375	8.896	.000**	Accepted
	R^2	0.84					
	Adjusted R^2	0.83					
	Sig. F		0.00				
	F-value	531.63					

** p-value <0.05 (two-tailed)
a. Dependent Variable: BITU

Tables 2 shows that A, PC, PU and PEOU all have significant relationship with lecturers' intention to use computer-based testing for assessment. However, they each had different impact on BI Of the three components PEOU was the most influential as it accounted for more the highest variance. The percentage of variance increased respectively from PU, PC and A. Hence all the hypotheses were supported.

Discussion and Conclusion
The use of technology for assessment has enhanced the quality of the assessment method method in Nigerian Universities. Yet, in the most lecturers do not want to use technology. From the prior literatures, it is always commented technology acceptance decision I different based on individual and their profession (Rogers, 1995, Agarwal, 2000). As a result, this study aimed to understand and identify the relationship with the behavioral intention of lecturers in the use of computer-based testing for assessment. lecturers' attitude was found to have significant relationship with the their behavioural intention to use computer-based testing. This finding is consistent with prior studies (Chau & Hu, 2002; Teo, 2009). The result revealed that positive attitude towards the use of computer-based testing for assessment in Nigerian Universities is important and essential for the task to be easy to use and credible.

The attitude of the lecturers towards the use of computer-based testing would make them have better intention to use computer-based testing. The finding agreed with Chau and Hu (2002), which attitude should be retained in the technology acceptance model for lecturers use of computer-based testing for assessment. Based on the result of the study, lecturers' attitude, perceived ease of use, perceived credibility and perceived usefulness are all having a significant relationship with the behavioural intention to use computer-based testing. The result of this finding is also in consonant with Aggellidis and Chatzoglous (2009), Fakorede and Olafare 2016a , Fakorede and Olafare 2016b. Based on this, the proposed model showed technology acceptance by University lecturers in Nigeria.

Theoretical Implications
Studies in the literature mainly adopted TAM model to explain the PU and PEOU towards the user technology adoption. Although TAM has shown users level of adopting technology, though it is not different in the education sector and most especially higher institutions of learning like the university where lecturers have different areas of specialization that affects their use of technology (Olafare, 2014). This affects their technology acceptance decision in terms of computer-based testing. In this study, the modified TAM was beyond the PU and PEOU as other constructs like attitude, perceived credibility was added as the independent variables. The findings showed the proposed model is significant and fix with a total 80.3% of the variables. The proposed model may contribute to the body of literature and it represented a new perspective to enhance understanding towards the conceptualization of technology acceptance by University lecturers in Nigeria.

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DEVELOPMENT OF MOBILE LEARNING APP FOR SELECTED TOPICS IN UNDERGRADUATES' USE OF LIBRARY

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Abstract
Mobile learning is creating a new paradigm for engaging the digital natives' students, with a flexible method of disseminating instructional contents. In fact, mobile learning is transforming the classroom all over the world, into a more ubiquitous environment where a learner can access instructional content at anytime, anywhere and anyhow. General Studies (GNS) according to the Nigerian Universities regulatory body (NUC) has been flagged as a compulsory course, which an undergraduate must pass before being allowed to graduate. The course was designed to help undergraduates fit well into the society, and also prepare them with soft skills for the world of work. However, the dissemination of the course has been marred with diverse challenges, such as overcrowding classroom, and others, thus making the students to dislike the course and perform below their expected capabilities. This research work was therefore embarked upon to develop a mobile learning application for the purpose of teaching a selected concept in the GNS series- Use of Library. The research deployed the use of the generic instructional development model known as the ADDIE. Each of the stages of the ADDIE model was religiously employed towards the development of the mobile App. Among other findings, it was discovered that the developmental process of mobile learning app is complex and cumbersome. More so, it was suggested that Nigerian Institutions can actually embark on the production of mobile learning applications for their courses, as this will assist in creating apps that are of indigenous curriculum-based content.
Keywords: Mobile Learning, ISD, GNS, ADDIE, Design and Development

Introduction
Information Communication Technology is becoming continually evolving with sporadic influence on all endeavor of human life. Every field of work has been in one way or the other influenced by ICT in the recent time. The fields of Medicine, Geology, Law, even politics are now enjoying a great impact of ICT which is improving their productivity. Education as a field and an Institution is not left behind in this technological explosion. In fact, it is no longer a gainsaying that ICT and Education are becoming a Siamese duo. Rapid development in one has led to a proportional development in the other. The miscegenation of these duo has in no little way better the later in great measure.

Moreover, the innovative development in mobile technological devices and the internet has seamlessly guided mobile learning into our educational structure and becoming a nascent part of the system . Schools can now bridge the gap between the classroom and the society, as teaching and learning in various educational classrooms around the world are progressively keeping pace with the benefits mobile learning brings to the education system (El-Abbouri, Hildebrandt, & Puckett, 2014).

Simply put, mobile learning can be defined as any form of learning delivered through mobile technological devices. M-learning is learning delivered or supported by handheld and mobile technologies and which can guarantee learning anywhere and anytime (Laouris & Eteokleous, nd; Robinson & Reinhart, 2014; Traxler, 2007; United Nations Educational, Scientific and Cultural Organization, UNESCO, 2013). The term mobile learning motion to any form of learning that transpires when the learner does not settle at a fixed, predetermined location. It is a form of learning that ensues when the learner key into learning opportunities offered by mobile technologies such as mobile phones and hand-held computers to enhance the learning process (Chanchary & Islam, 2011).

Statement of Problem
The proliferation of smart digital devices in Nigeria is on an increase year in year out. Nigeria is projected to have 18million new smartphone users in 2017, and by 2019 the number of smartphone users in Nigeria would have grown with about 23.3 million new users . Report also has it that Nigerian spend most time using smart devices (smartphone and tablets inclusive), then they spend watching television and laptops. Statistically, report has it that over 193 minutes is spent by Nigerian using smart devices, while television and laptop takes 131minutes and 80minutes respectively . More so, institutions around the country have been playing diverse roles in upsurge of mobile device ownership among students in Nigeria. The State Government of Osun commenced distribution of tablet devices among the senior secondary school student in the state .

In the same vein, University of Ilorin began its 1:1 mobile computing campaign in May 2014. A programme which provide every fresh undergraduate with a tablet PC each (University of Ilorin, 2014).

In spite of this rapid increase in mobile devices ownership among the undergraduates, there is this need to provide indigenously developed learning materials, in form of mobile applications installed on them. Several students use their devices for futile activities like playing games, watching movies, taking 'selfies', financial frauds, etc. (Yusuf, et al., 2015).

Despite inherent promises that mobile learning comes with, Nigerian universities, to the best of the researcher's few findings, little have been done in the area of design and development of mobile learning Apps for Android devices. In Nigeria, Mbanusi (2012) developed a mobile learning App using the Java Micro Edition, (J2ME) programming language, which run only on S40, Java phones, thereby incompatible with contemporary smartphones (Blackberry, Android, IOS, etc.). In advanced countries, studies indicated the development of different mobile applications like blackboard, desire2learn, mobl21, and so on had helped better the students' performance in learning (Barbour, Grzebyk, & Eye, 2014; Ishtaiwa, 2014).

Therefore, there is need for Nigerian educators to harness the opportunities in mobile learning and create contextually relevant curriculum based mobile learning apps for all courses offered in Nigerian universities. Therefore, this study was embarked on to explore the potential of developing a mobile App on a General Studies Course (Use of Library). In a more explicit term, the study attempted to focus more on the processes involved in the development of an android based mobile learning application as guided by the element of the ADDIE model of instructional development.

Review of Literature

The 21st century advancement of technology and computing is ushering in an era of mobility, an era whereby users can have easy access to computing anywhere, anytime via the use of smaller and more powerful portable devices, expanding coverage for wireless and cellular networks, and a flourishing pool of applications that take advantage of these technologies promise that one day, most things you can do at a desktop computer will be possible from a mobile device .

Mobile devices are made in a wide array of sizes, designs, capabilities and functionalities, using the cellular networks and Wi-Fi or a combination of the two, they also possess touch-screen for easy user interface display. They run on diverse Operating Systems (OS), and support for software built on Java and Flash (Livingston, 2004; EDUCAUSE, 2010). It is no surprise however, how the mobile technology is the fastest spreading technology of the 21st century, making a population of over six billion subscribers worldwide (Regalado, 2013). To back this up, UNESCO (2015), asserted that for every one person who accesses the internet from a computer two do so from a mobile device.

The use of wireless mobile device as suggested by (Chen, Seihamer, Bennett, & Bauer, 2015) will enable new learning opportunities, as its flexibility allows anyone to access information from anywhere and at any time. Ally (2009) is of the opinion that the use of mobile technology will allow citizen of the world to access learning materials and information from anywhere and at any time. The anytime and anywhere learning is referred to as Mobile Learning.

Mobile learning involves change, it provides opportunity to effect changes in the tutors and peers ability to communicate, as well as methods of accessing learning resources (Jisc, 2015). The mobile era is bringing new dimensions into teaching and learning, as opposed by the ancient didactic method, where the teacher assume the role of know all in the classroom. Mobile learning is however creating a new platform, changing the orientation that learning is restricted in the classroom and considering mobility in learning.

Developing mobile learning App is a cumbersome process which require adequate skills in software programming, graphics design, instructional design and content localizing (Khanghah & Halili, 2015). These skills when well combined and utilized determines the quality of the mobile App. Mobile learning App should be developed in such a way that it is useable, applicable and functional in order to make learning fun, engaging and pleasurable to learners . Ten research priorities have been itemized to guide researchers in mobile learning development they are: 1) teaching and learning strategies; 2) affordances; 3) theory; 4) settings of learning; 5) evaluation/assessment; 6) learners; 7) mobile technologies and interface design; 8) context awareness and augmented reality; 9) infrastructure and management; and 10) country and digital divide .

General Studies programmes, being one of the important courses taken by undergraduates all over the world, has be said to equip the students with diverse range of study and skills which are useful for the students' development and opportunity to grow, learn, and achieve while in the university and after graduating from the university (Northeastern University, 2009; Study.com, n.d.). The General Studies offer content which is aimed at stimulating and broadening student's awareness and knowledge in relevant fields outside his immediate area of specialization (University of Calabar, 2011).

According to Ogenyi (2015), Nigerian universities can only meet the recommendations of Phelps-Stokes Commission on African education only if courses in the general studies programmes are well taught. This made the National University Commission (NUC) to approve the Basic Minimum Academic Standard (BMAS) for General Studies for all Nigerian Universities in 1989 and thus making it compulsory for all categories of studies (Federal University Ndufu-Alike Ikwo [FUNNAI], n.d.) .

The General Studies programme has been instrumental to broadening the scope of reasoning and body of knowledge of the young graduates (Ogenyi, 2015). With the fact that General Studies is a compulsory course for all undergraduates, it has been marred by overcrowded classroom. Thereby making it unenticing for the students to attend (Nweke & Nwoye, 2016). More so, students often complained on the manner to which the course is presented, a voluminous textbook full of theories and stories (Ihenetu, 2015). In order to salvage, the depreciating situation of the teaching and learning of GNS in Nigerian University, it is imperative that educators began to turn into ICT in order to influence the teaching of the subject. It is no mere gainsaying that ICT motivates learners into active learning (Passey, Rogers, Machell, & McHugh, 2004), therefore, the capabilities of mobile technological devices as resource for technological enhanced learning, can be deployed in order to better the teaching and learning of GNS in the country.

Methodology

The study utilized a design based approach, entailing the use of ADDIE model of instructional system design in guiding the development of mobile learning application for Undergraduates' GNS Use of Library. Each of the stages of the ADDIE model- Analysis, Design, Development, Implementation and Evaluation- was religiously followed and documented in order to help fabricate a quality, instructional worthy mobile application. Although, the ADDIE model has five stages, as identified earlier, the first three stages - Analysis, Design and Development - captured the development process. The other two stages- Implementation and Evaluation- were captured in another publication.

Analysis: At this stage, the need analysis and task analysis was carried. During the need analysis, an attempt is made by the researcher to look at the problem associated with the students' low performance despite the high possession of mobile and smartphone devices. Many of the identified problem were discussed in another paper. In the task analysis, a framework of the whole research process was proposed by the research. The researcher looked futuristically on the possibility and feasibility of developing the Mobile App and a timeline was drawn, questions were being asked and searches were made by the researcher on devising the easiest and cost-efficient method of developing a mobile app that will run on Android devices among several options.

Design: This is the second stage in the procedural process of developing the GNS Mobile App, in this stage, the researcher began with brainstorming on content selection, the GNS (Use of Library) was later chosen after considering many other options available. The decision was based on the availability of a standardized textbook on the selected content. A letter was therefore written to the appropriate authority for the permission to use the part of the content of the text, which was duly granted. The textbook was digitalized, through the help of two typist hired for the purpose of the research. A comp was designed by the researcher which would later form the plan in which the user interface would be developed on. At this stage, the researcher had to select from myriads of evaluation models, and he later opted for M3 evaluation framework due to the fact that it was specifically developed to evaluate mobile learning app and also its relative recency (2009) compared to the other ones. In this regard, a mail was formerly sent to one of the authors of the framework (Mike Sharpels) for approval to use the model, which was unreservedly granted. Resources like JQuery Library, JQuery Mobile, JQuery Themeroller, and graphics were all shopped for online, and were downloaded at no cost.

Develop: After the design phase comes the development phase. The researcher opted for a cross-platform development technology for the development of the mobile App. Cross-Platform technology is a cheap alternative to developing App by using the native language for each of the operating systems. For instance, Android is developed on Java, IOS on Objective C, and Blackberry on C. which implies that different codes will be written to accommodate the three platforms, which is very expensive and complex to maintain. Cross-platform technology allows the programmer to code in Hyper Text Mark-up Language Five (HTML5) with Cascading Style Sheet (CSS3) and JavaScript, and this will be processed through a third party build service (Cordova) into any of the O.S. platforms as shown in Figure 1, thus making it more cheaper and time friendly.
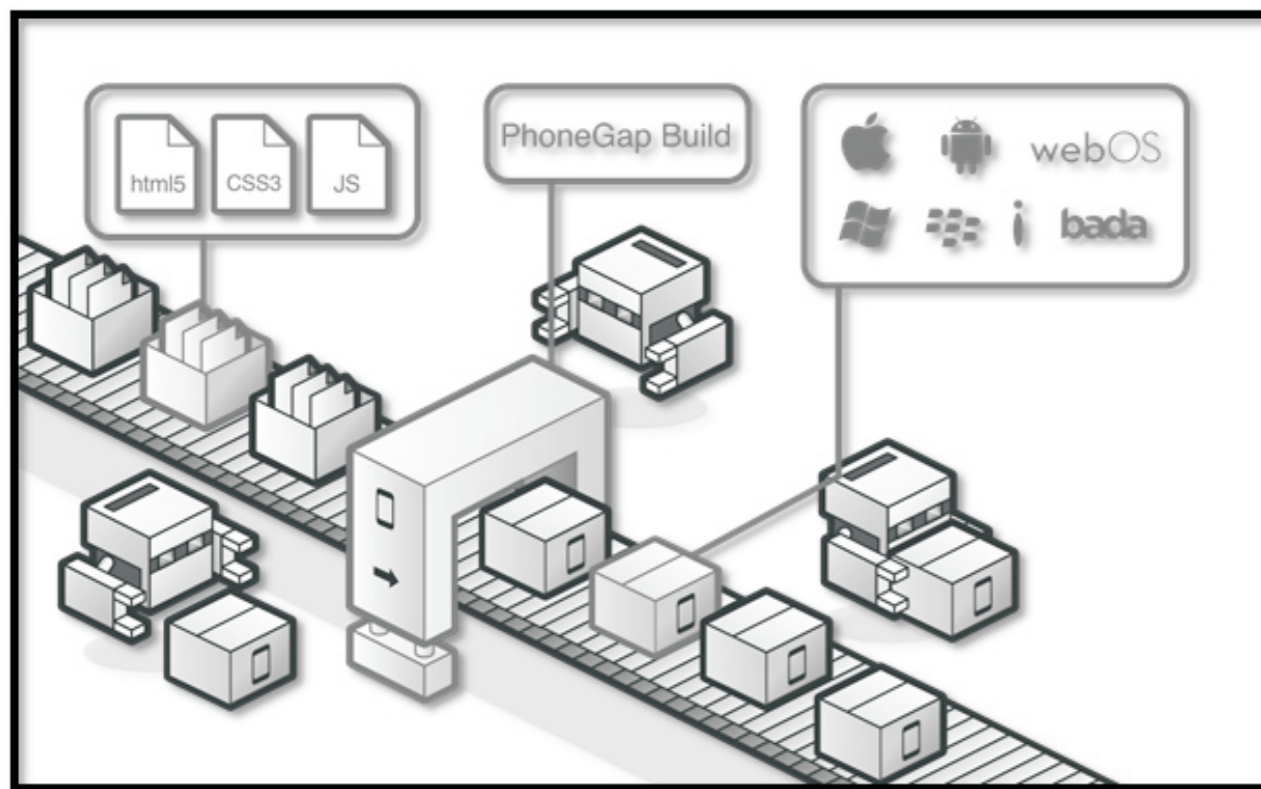
Figure : An Illustration of Cross-Platform Build Technology (Phone Gap/Cordova)
Source: (Stack Exchange, 2013)

Figure : A code snippet of the HTML 5 used in the mobile learning app development

HTML5 was the code used in designing the basic structure of the user interface, CSS3 was used to add flesh to the skeletal structure produced through HTML5. The colours and positioning of the elements of the HTML is achieved through the use of the CSS. JavaScript is used in deploying client side interactivity in the App. A JavaScript library, JQuery and JQuery mobile were utilized as a form of shorthand to long JavaScript code, and this helped the researcher to achieve more with little codes. Each of these libraries were embedded in the head section of the HTML5 code, in order to allow for quick and optimal functionality, as shown in the code snippet in figure 2. Adobe Fireworks which is part of the Adobe Creative Suite was used in handling the graphics and creating a Portable Network Graphics (PNG) files which were used for illustrations in the App. All coding (HTML, CSS, JavaScript) were done using the Adobe Dreamweaver CS6. The App was however previewed live on the browsers (Mozilla Firefox and Google Chrome) to test for the user interface display while the code is being written.

The initial build of the app was done locally using Eclipse (Juno version) with MobiDev plugins, and a test version was developed and installed on the researcher's device. The installed App was validated by computer experts and educational technology experts. The loading time, the on-screen display and the file size was monitored, and this helped in modifying and minifying the codes in the subsequent build. Features like self-quiz was also added based on the recommendations of the validators.

Discussions and Conclusion

Without any iota of doubt, mobile learning as a Technology Enhanced Learning, is an innovation to teaching and learning that have come to stay. It is however imperative for educators at all levels to embrace it and begin to develop in this area. More than just developing the mobile app, teachers should liaise with other stakeholders, like instructional designers, programmers, graphics artist, UX experts, etc. in order to come up with an efficient and effective app useful for instruction. It is therefore a high time that Nigerian educator began to leverage on the use of diverse open source and low-cost platforms in order to create an indigenously crafted mobile learning app, in order to help augment the face to face classroom teaching and learning. Also, the ADDIE model, is still a very relevant process of developing instructional packages, when all of the elements in the model are judiciously harnessed, a quality instructional product can be guaranteed.

Tertiary institutions in Nigeria should also venture into development of mobile learning applications in order to supplement their teaching, and also to help decongest large classrooms in general courses like GNS. This will go a long way in actualizing the objective of the course as stated by the NUC, and also justify the inclusion of the course in the Basic Minimum Academic Standard (BMAS) for the Nigerian Universities.

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THE FLIPPED CLASSROOM: IT'S EFFECT ON STUDENTS' PERFORMANCE AND RETENTION IN SECONDARY SCHOOL MATHEMATICS

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Abstract
This article reports the impacts of flipped classroom (FC) on teaching and learning from a study that examined: (i.) the effects of a developed flipped classroom package (FCP) on senior secondary school students' post-test performance (PP) and retention performance (RP) in mathematics in Lagos, Nigeria; and (ii.) influence of gender on PP and RP of students towards learning mathematics in FC. The quasi-experimental data were drawn from 268 students (145 for experimental taught with offline video and 123 for control group taught with lesson note). Three research instruments were used: developed FCP; Lesson note; and performance test. The instruments were validated and tested for reliability which yielded 0.78, 0.85 and 0.95 respectively. Hypotheses formulated were tested using (ANCOVA). The findings revealed that: (i) developed FCP was effective, there was a significant difference in the PP $F_{(1,265)} = 142.002$, p=.00 and RP $F_{(1, 265)} = 130.24$, p = .00 of students since the p-values 0.00 < 0.05 alpha value which favoured the FC and (ii) no significant difference existed in the post-test performance and retention performance of both male and female students in FC. The study concluded that flipped classroom improved students' performance in mathematics. It was therefore recommended among others that if the use of flipped classroom to teach mathematics is encouraged, there will be a great improvement in students' performance in mathematics.
Keywords: flipped classroom, performance, retention

Introduction

Education is the process of imparting and acquiring knowledge through teaching and learning in educational institutions. Nigeria, a developing country and a member of the global community cannot afford to be backwards in education. In the Nigerian National Policy on education (FRN, 2009), it is stipulated that education should sustain individual citizens and society at large in consonance with the realities of the immediate environment and the modern world. The speed of growth of any nation is influenced by her stage of educational advancement. However, no country can claim to be educationally advanced without embracing information and communication technology (ICT) in her educational activities.

Yusuf (2006) described ICT as any communication devices or applications encircling radio, television, cellular phones, computer (hardware and software) social network and satellite systems, and stimulated terms like e-learning, e-teaching, virtual teaching/learning and e-training among others that are developed around the field of education. The use of ICT can offer a rich choice of learning experiences that are appropriate for students' needs, space, pace, aspirations and learning styles as opined by Olorundare (2011). Research has confirmed that 20% of what people see, 40% of what they see and hear, and about 75% of what they see, hear and do remembered respectively (Oshinaike & Adekunmisi, 2012). Remembering of what learnt after a period of time is termed as retention. Santa (2006) opined that from childhood, children are told that performance is a result of learning.

Transforms in active learning pedagogy, linked with innovations in instructional technology promote good performance and retention, this has induced prominent educators to employ a fundamental, yet perceptive, educational model called the flipped classroom (Bergmann & Sams, 2012). In flipped classroom (FC), teacher substitutes in-class instruction with at home video instruction offline (television and DVD player/computer) or online (YouTube/Khan Academy or other educational sites) and utilises class time for homework assignments and other project-based learning activities in the presence of a teacher as a guide.

This is one of the features FC possesses that make it distinct from other methods of teaching. Little wonder, the recorded videos on subjects/topics for primary/secondary school students on Compact Disc/Digital Video Disc (CD/DVD) that are selling all over the places in Nigeria are only going to assist few good students because no feedback and nobody is available to assess students' understanding and explain the difficult concepts of the lessons recorded. Hence, students' contribution will not be possible. As a result, subjects like Mathematics, English language and so on cannot understand effectively with this approach. The poor performance of students in mathematics despite its importance was attributed to poor teaching approach (FRN, 2014; WAEC, 2016), and poor learning environment (Olunloye, 2010). The poor performance in mathematics as illustrated in the statistical analysis of students' performance in final year mathematics examinations of West African Secondary School Certificate Examinations (WASSCE) (Table 1) requires urgent attention.

Table 1:
Students' Performance in Mathematics in (WASSCE), 2012-2016
Source: Statistic Office WAEC, Lagos, (2016)

Year	Number of Candidates sat for the Examination	Pass at Credit (A1 - C6)	% Credit Pass (A1 - C6)
2012	1,657,754	839,046	50.61
2013	1,658,187	899,901	54.27
2014	1,632,377	1,011,608	61.97
2015	1,593,442	616,343	38.68
2016	1,544,234	878,040	52.97

For two consecutive years (2012-2013), students' performance in Mathematics was on average (50.61% and 54.27%) but improved in 2014 (61.97%). Poor performance was recorded in 2015 (38.68%) but it was better in 2016 (52.97%). These results indicated that about 50% of the students do not have the required mathematics grade (at least a credit) for admission into higher institutions in Nigeria. According to the Chief Examiners Reports for 2012 - 2016 WASSC examinations (WAEC, 2016), the poor performance was attributed to poor understanding of contents and concepts of some major aspects of the syllabus specifically geometry and trigonometry.

Another factor influencing mathematics learning has been marked as students' retention. Hornby (2001) described retention as the ability of a student to remember things learnt after a period of time. It also helps the successful application of knowledge learned in other subject areas. If the retentive ability of students is poor, teachers will use most class time reviewing and re-teaching the same concepts. Marcellious (2001) indicated that in today's classroom, one of the most important factors is retention of concepts that are taught to the students. Retention in mathematics is not only acquired by students through rote-learning but through appropriate teaching methods (Chianson, 2008).

Many research studies suggested a complete refurbishment of the public education system (Rycik, 2012), other research studies suggested that educators explore substitutes to the traditional classroom (Anderson, 2007). Educators are now applying mixed curricula that include artificial intelligence software, multimedia assisted instruction, and even the inverted curriculum (Ritter, Anderson, Koedinger, & Corbett, 2007). Research suggested flipped classroom as one solution to this problem (Berrett, 2012; Alverze, 2012; Strayer, 2007; Fulton, 2012; Esperanza, Fabian, & Toto, 2016; Charles-Ogan, & Williams, 2015).

Statement of the Problem
Due to poor teaching methods (WAEC, 2016), poor learning environment and motivation to learn mathematics (Aborisade, 2009), and requirements deficiencies (Hull & Seeley, 2010), research has affirmed that mathematics students are not learning the concepts necessary for mathematics skill (Schullery, Reck, & Schullery, 2011). If this trend continues, Nigerian students may not be able to efficiently measure up in the large-scale economy (Ale & Lawal, 2012). To address this issue, this study sought to examine the effect of the flipped classroom on senior secondary school mathematics students' performance and retention using a researcher developed flipped classroom package to determine: (a) whether FC will help to improve students' post-test performance in Mathematics, and (b) whether retention performance among senior secondary school (SSS) students be improved if FC is adopted by Mathematics teachers.

Purpose of the Study
The main purpose of this study was to examine the effects of the FC package on Senior Secondary School Students' performance in Mathematics. The specific objectives are to:
1. determine the difference(s) in the post-test performance of students taught mathematics using the Flipped Classroom (FC) and those taught using the Traditional Classroom (TC) method.
2. examine the difference(s) between the retention of students taught mathematics using the flipped classroom (FC) and those taught using the Traditional Classroom (TC).

Research Questions
The following research questions were raised in the study:
1. Is there a difference in the post-test performance of students taught mathematics using the FC and those taught using the TC method during a twelve-week term?
2. Is there a difference between the retention performance of students taught mathematics using the FC and those taught using the TC during a twelve-week term?

Research Hypotheses
Based on research questions, the following null hypotheses were tested in this study:
H_{O1}: There is no significant difference between the post-test performance of students taught mathematics using a developed FCP and those taught using the TC method.
H_{O2}: There is no significant difference between the retention performance of students taught mathematics using a developed FCP and those taught using the TC method.

Significance of the Study
The outcome of the study may serve as a useful guide to Nigerian secondary schools intending to adopt FC in teaching mathematics and other subjects that students find difficult to understand. The outcome of this study would help students in Nigerian secondary schools to increase their preparation for examination content, improve their opinions about mathematics, through FC. This may also increase students' computer experiences which may help to ease their phobia, lack of preparedness and mode effect on FC.

Parents being the intermediary between the schools and the students, will give the opportunity for thorough monitoring of the students' progress in their mathematics learning through FC. This will also allow parents to see by themselves since much activities would be taking place at home. Lazy students will be exposed through FC instruction and enable the parents to have first-hand information about the performance of their children and in turn, assist the school, examinations boards, government and the teachers on how to help the student(s).

Literature Review
The flipped classroom or inverted classroom is a new learning style in the educational system. It develops on the peer teaching strategies that started in the late 19th century. FC is a conjoined learning model that brings basic content out of the planned class time for learners to study freely, allowing educator to involve students in group discussions and interactive learning activities during the lesson period in the class to promote higher-level thinking (Bergmann & Sams, 2012). The significance of student-centered learning theories to flipped classroom cannot be minimalist. Without these, the flipped classroom simply does not be. As shown in a simple model for flipping the classroom (Fig. 1), the flipped classroom is made up of three segments: a pre-class segment that requires students' communication with learning materials through online or offline activities; In-class activities which involves collaborations among the learners and the teacher and students – students interaction in the class for real learning concepts; and lastly, the post-class component that is programmed via the application of computer technologies.
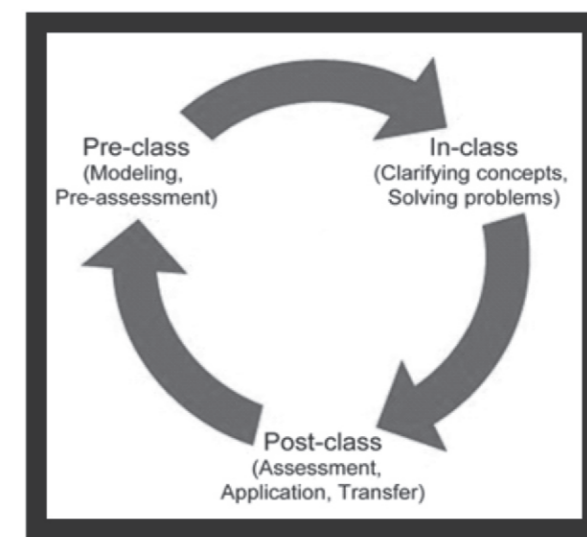
Figure 1. A simple model for flipping the classroom
Source: Estes, Ingram and Liu (2014

Thompson (2011) noted that flipped classroom increased popularity in the past few years. Salman Khan, the Khan Academy originator in 2006 endeavour to give tutoring to his junior family members online at a distance. He recorded his lessons on videos and uploaded it for them to watch and study on their own. These videos became so many in number, that he began to catalogue them, and later developed a website named Khan Academy. However, Lisa and Jeremy (2012) observed that as the knowledge of using online lessons to support education spread instructors began to examine the value of applying it to promote acquisition of knowledge, the following questions were then asked: Possibly will lesson learnt online at home be useful in totally to the classroom teaching? Might learners study lessons for homework and then apply it at school and improved learning? These are the basic questions flipped classroom came to answer.

The flipped classroom is a mixture approach to learning, using technology to move lecture to homework and using face-to-face classroom time for interactive class activities. Similarly, Ronchetti (2010) pointed to the methodology in higher institution that involves teacher development of recorded video lectures usually given to students to watch and study outside of the classroom. Classroom time now meant for discussion, exercises, or other activities to boost the usage of skill. Study by Charles-Ogan and Williams (2015) reveals that there was a significant difference in pretest-posttest scores of students in the flipped classroom when comparing performance using offline Video CD recorded by the teacher with conventional classroom students in mathematics in River State, Nigeria which is in favour of flipped classroom. Also, Esperanza et-al, (2016) opined that the use of flipped classroom model resulted in gains in student performance generally.

Likewise, Fulton (2012) mentioned among others the advantages of the flipped classroom: (i.) Students work at will, pace and doing assignment in class gives teacher best insight into difficulties and learning styles of students; (ii.) Teachers can more easily customise and revise the syllabus and provide it to students 24 hours per day and 7 days per week while classroom time can be effectively used; (iii.) Teachers applying this method report seeing good students' performance and interest because learning theories support the latest techniques; and (iv.) Flipped classroom makes use of technology which is flexible and appropriate for present learning situation.

Theoretical Framework

A lot of learning approaches based on students-centered learning supported FC as illustrated in the Venn diagram in Figure 1. Prince (2004) defined active learning broadly as, any instructional method that engages students in the learning process. However, in an effort to maintain contrast with traditional teacher-centered approaches, these methods are systematically dismissed by explicit exclusion. Thus, active learning acts as a superset for both peer-assisted and problem-based learning approaches. Prince also clarifies the relationship between these two, indicating that problem-based learning is, always active and usually (but not necessarily) collaborative or cooperative as illustrated in Figure 2.

The theoretical foundations used for justifying the flipped classroom typically focus on reasons for not using classroom time to deliver lectures. These stem from a large body of literature on student-centered learning, which looks primarily to the theory of Piaget 1967 and Vygotsky 1978. Tudge and Winterhoff (1993) provided a detailed analysis of the similarities and differences between these two theories. Foot and Howe (1998) provided the background outlining connections leading to peer-assisted learning. In particular, they pointed out that constructivism and collaborative learning stem from Piaget's theory of cognitive conflict, and that cooperative learning stems from Vygotsky's zone of proximal development. The importance of these (student-centered) learning theories to the flipped classroom cannot be understated. Without these, the flipped classroom simply does not exist.
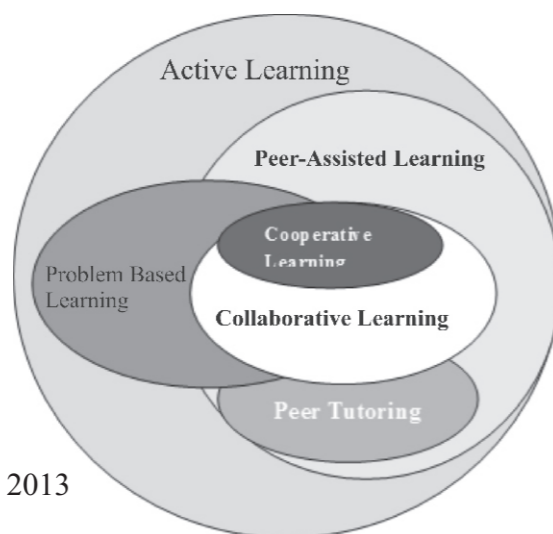
Figure 2: Venn diagram of Several
Students-Centered Learning
Theories and Methods
Adapted from: Bishop and Verleger, 2013

Conceptual Design

The concept of this study rooted from the theories of cognitive conflict and constructivism of Piaget (1967) that led to several students-centered learning theories and methods that identify Retention and Performance as the main dependent variables while flipped classroom and traditional classroom were considered as independent variables in the flipped classroom model. Below is the Conceptual model for students' performance in flipped classroom (Fig. 3). The students' performance and retention in mathematics were examined in the two classes to ascertain the effectiveness of the FC.
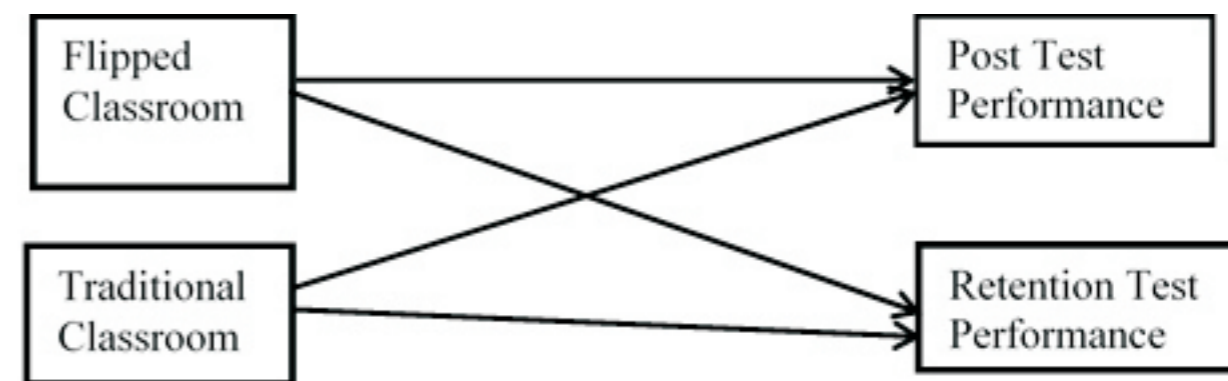
Figure 3. Conceptual Model for Students Performance in Flipped Classroom
Source: Researcher- designed conceptual model (Makinde, 2017)

Methodology

This study employed quasi-experimental design in which *268 (145 experimental group of 78 male; 67 female and 123 control group of 66 male; 57 female) students of* Senior Secondary School II (SSS II) in Lagos, Nigeria *from two schools purposively selected and participated in the study. The instruments used:* (i) a developed Flipped Classroom Package (FCP); (ii) Mathematics Performance Test (MPT); and (iii) Lesson Notes (LN). The instruments *were validated by six experts from mathematics department, educational technology department, experts in software designing, University of Ilorin, Ilorin Nigeria and two secondary school mathematics teachers.* The instruments were tested for reliability which yielded 0.78, 0.85 and 0.95 respectively. *Test-retest method was used during and after* the experiment *to determine the retention of the students.* The researcher with two research assistants administered the MPT instrument. Two research questions were raised and answered along with their hypotheses at 0.05 level of significance using ANCOVA. The use of ANCOVA was to control for the differences between groups as revealed in the pre-test.

Discussion

Results

Table 2:
Descriptive Statistics' on the Pre-test Scores for the Groups

Group	N	Mean	Std. Deviation
Experimental	145	10.051	2.8632
Control	123	10.048	2.8924
Total	268	10.046	2.8778

Table 2 shows at a glance that the difference between the experimental group and the control group was very insignificant with the mean score and standard deviation for experimental group as 10.051 and 2.86 respectively while the control group being respectively 10.048 and 2.89. The mean and standard deviation indices are shown in Table 2 above are the indications that there was homogeneity in the level of mathematics performances among all the students before the treatment. However, the post-test analysis on research questions was meant to test the hypotheses on the effect of the treatment on the experimental group.

Hypotheses Testing

H_{o1}:   There is no significant differences in the performance of students taught mathematics using the Flipped Classroom (FC) and those taught with Traditional Classroom (TC).

The analyses for testing this hypothesis are shown in Table 3, descriptive statistics and Table 4, the ANCOVA results for the groups.

Table 3 :

Descriptive Statistics' on the Post-test Scores for the Groups

Group	N	Mean	Std. Deviation
Experimental	145	28.441	4.8632
Control	123	23.886	5.7974
Total	268	26.351	5.7693

Table 4 :

ANCOVA Result on the post -test performance of the Experimental and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4273.552[a]	2	2136.776	122.737	.000
Intercept	16371.304	1	16371.304	940.374	.000
Pre-test	2892.680	1	2892.680	166.157	.000
Group	2472.158	1	2472.158	142.002	.000
Error	4613.478	265	17.409		
Total	194976.000	268			
Corrected Total	8887.030	267			

a. R Squared = .481 (Adjusted R Squared = .477).

The results in Table 3 showed that the flipped classroom experimental group had higher post mean score (M = 28.44, SD = 4.86) than their traditional classroom control group counterparts (M = 23.89, SD = 5.80), using a bench mark of 20.00. Results in Table 4 for ANCOVA, F (1, 265) = 142.002, p = .000. Since the p-value is less than alpha value of 0.05, the null hypothesis is rejected; this shows that there was a significant difference in the performance of students taught mathematics using flipped classroom and those taught using the traditional classroom as reflected in the mean and standard deviation. The use of flipped classroom is more effective.

H_{o2}:   There is no significant difference in the retention performance of students taught mathematics using the FC and those taught using the TC.

For testing hypothesis two, the results analyses are as shown in Table 5 for the descriptive statistics, Table 6 for the ANCOVA results on the retention scores of the experimental and control groups.

Table 5 : Descriptive Statistics on the Retention scores of the Group.

Group	N	Mean	Std. Deviation
Experimental	145	25.476	5.0237
Control	123	20.756	5.3704
Total	268	23.310	5.6870

Table 6: ANCOVA Result on the Retention performance of the Experimental and Control Groups.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3693.474[a]	2	1846.737	99.029	.000
Intercept	12881.735	1	12881.735	690.770	.000
Pre-test	2211.028	1	2211.028	118.564	.000
Group	2428.767	1	2428.767	130.240	.000
Error	4941.820	265	18.648		
Total	154251.000	268			
Corrected Total	8635.295	267			

a. R Squared = .428 (Adjusted R Squared = .423)

As indicated in Table 5 the experimental group had the higher mean score (M = 25.48, SD = 5.0237), while the control group had (M = 20.76, SD = 5.3704) using 20.00 as a bench mark. The ANCOVA results shown in Table 6 reveals that there was a significant difference, F (1, 265) = 130.240, p = 0.000. Since the p-value is less than alpha value of 0.05, the null hypothesis is rejected, this indicates that there was a significant difference between the retention performance of students taught mathematics using flipped classroom and traditional classroom method as reflected in the mean and standard deviation.

Summary of Findings

The findings of the study corroborated earlier assertions of Charles-Ogan and Williams (2015) which reveals that there was a significant difference in pretest-posttest scores in favour of the flipped classroom when comparing performance using offline Video CD recorded by the teacher with conventional classroom students in mathematics in River State, Nigeria. This is also consistent with the active learning studies which found that flipped classroom resulted in general improvement in academic achievement effect in mathematics activities and problem solving (Fulton, 2012). Also, the results were in conformity with Esperanza, Fabian and Toto (2016) who revealed that the use of flipped classroom model had resulted in gains in student performance. This study also agreed with the earlier finding of Marcellious (2001) which indicated that in today's classroom, one of the most important factors is retention of concepts that are taught to the students. It was added that without retention, there cannot be a successful transfer of knowledge from one subject area to another. Also in agreement with Chianson (2008) that retention in mathematics is not acquired by mere rote memorisation but through appropriate teaching method like flipped classroom.

Conclusions and Implications

This study indicated that the flipped classroom method of teaching facilitated learning. Improved the post-test performance scores and high retention scores of students in mathematics when compared with traditional classroom. Hence, there is an urgent need of flipped classroom learning approach to address the poor performance of students in mathematics, in order to promote science and technological development in Nigeria, since the bedrock of all science and technological related discipline is Mathematics.

Recommendations

Based on the findings and conclusions of this study, the following recommendations were made;

1. Teachers should adopt the flipped classroom approach in totality because it is a student-centered learning strategy   t h a t engages the students rather than spoon-feed.

2. All stakeholders in the education industry including parents should see flipped classroom as an innovation which   must be welcomed, supported and its usage sustained in Nigeria.

Implication of Research Findings

Based on the findings of the study, the following implications can be drawn. The findings of this research have strong implications for the teaching and learning methods of mathematics in Nigeria, most especially secondary school level. This study offered an experiential foundation to institute that there would be a great improvement in the teaching and learning of mathematics at the high schools if flipped classroom method of teaching could be adopted by secondary school teachers. If flipped classroom method of teaching is adopted at secondary schools, it can help to increase students' involvement in instructional activities through enhanced confidence, the interaction between teachers and students during the period of learning, ability to learn at will and teachers as assessors may observe students displaying these skills. The findings of this study also indicated that students' gender is not a barrier to their performance. The implication is that flipped classroom can enhance both the students' short-term (post-test performance) and long term (retention) learning of instructional contents, irrespective of gender.

The positive results of findings of flipped classroom method of teaching have implication for secondary school teachers as they need to model the good use of various strategies of flipping the classroom. They need training and retraining on the method and approach of the strategy in their classroom instruction, most especially in their presentation in class based on the available and accessible resources.

The findings also have direct implications for the re-designing of the curriculum of mathematics at the secondary school to incorporate the flipped classroom learning method. To achieve this, curriculum developers at the NERDC and at the state level must be appraised with the knowledge and skills involved in developing a curriculum based on flipped classroom teaching strategy.

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INSTITUTIONAL FACTORS AS PREDICTORS OF COLLEGES OF EDUCATION LECTURERS' INFORMATION AND COMMUNICATION TECHNOLOGY VERSATILITY LEVEL IN SOUTH-WEST, NIGERIA

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Abstract
The value and relevance of Information and Communication Technology (ICT) to the sustenance and improvement of the field of education cannot be over-emphasized. Previous research in related studies pointed out many factors that account for non-use of ICT tools in schools. Some of these researchers concentrated on the secondary schools and universities. Other studies were based on foreign countries. However, most of these studies have left out institutional factors in relation to colleges of education where these teachers are produced. This gap in knowledge should not be allowed to continue uninvestigated if the country is to achieve the educational objectives of producing qualitative graduates to power the Nigerian economy. The objectives of this study were to investigate the colleges of education lecturers' versatility levels in e-learning, based on composite contribution and linear contribution among predictor variables and the versatility levels in e-learning,. The research adopted a descriptive survey method, with sample drawn from 11colleges of education in South-west, Nigeria. Respondents were 1,088 lecturers, (660 males 420 females). The instrument used was 'questionnaire on appraisal of predictor variables on colleges of education lecturers' versatility level which was validated by experts and the reliability index was determined using Cronbach Alpha, the value was 0.93. Regression analysis was used to test research question one and two. Findings showed that there was significant relationship among COE lecturers' versatility level in e-learning, conception, government policy, institutional strategies, availability of e-learning infrastructure and capacity building. ANOVA value of (F$_{5, 1082}$) =59.39; p < 0.00) for versatility level; and that capacity building value has the strongest positive effect on versatility level.
Keywords: Institutional Factor, College of Education, Composite, Linear, e-Learning and Versatility level.

Introduction

ICT has been acknowledged to be one of the most critical tools underpinning social and economic development in the 21st century (Traynor, 2003). Its global importance has led to numerous countries transforming their ICT sectors to lend support to other critical sectors in terms of efficiency, productivity and transparency, thus leading to job creation, better governance and overall social and economic development. Nigeria has embarked upon this path and in 2011 created the Ministry of Communication Technology to ensure better coordination of ICT activities and development in Nigeria. This National ICT Policy lays out the inputs required to strengthen all productive sectors and ultimately transform Nigeria into a knowledge based and globally competitive country in alignment with the National Vision 20:20 objectives (NITEF, 2010). For the successful implementation of ICT policies, programmes and instructional use of ICT in Nigerian schools especially in colleges of education, one cannot think of ICT integration and use in instructional delivery without determining whether the teachers/lecturers are acquainted with the operational skills of the e-learning components.

Institutional factors help to improve teachers' existing attributes. According to Vannatta & Fordham (2004), teacher's time committed to teaching and amount of technology training are reliable factors of technology use in classroom. They asserted that teacher trainers and administrators should not only provide extensive training on educational technology, but should also facilitate a contribution to teaching improvement. Norris, Poirot & Soloway (2003) also pointed out to the importance of access to technology. Therefore, an understanding of institutional characteristics that influence teachers' adoption and integration of ICT into teaching is relevant.

On the school level, factors such as support, funding, training and facilities influence teachers' adoption and integration of technologies into their classrooms. Teachers' professional development is a key factor to successful integration of computers into classroom teaching. ICT related training programs develop teachers' competences in computer use (Bauer & Kenton, 2005; Franklin, 2007; Wozney et al., 2006), influencing teachers' attitudes towards computers (Keengwe and Onchwari, 2008) and assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008).

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Though infrastructure support is imperative, school technology leadership is a stronger predictor of teachers' use of computer technology in teaching (Anderson & Dexter, 2005). Yee (2000) believes that a leader who implements technology plans and also shares a common vision with the teachers stimulate them to use technology in their lessons. Smarkola (2007) suggests that for effective utilization of ICT by teachers, there is the need for a strong leadership to drive a well designed technology plans in schools (Lai & Pratt, 2004).

Becta (2008) report on the effect of ICT on teaching in basic schools in United Kingdom also stressed on significance of good leadership (Lai & Pratt, 2004). In addition, Becta (2008) identified five factors that were essential to be present in schools if ICT was to be utilized properly (Lai & Pratt, 2004). These factors were ICT resources, ICT teaching, ICT leadership, general teaching and general school leadership. Although ICT opportunities are typically provided by the classroom teachers, the quality of leadership and management of ICT in a school is crucial to the provision of good ICT learning opportunities. As the quality of ICT leadership improves, so does the percentage factors influencing teachers' adoption and integration of ICT of schools providing good quality ICT learning opportunities (Lai & Pratt, 2004).Wong & Li (2008) conducted a study on factors that influenced transformational integration of ICT in eight schools in Hong Kong and Singapore.

The study revealed that leadership promotion of collaboration and experimentation and teachers dedication to student-centred learning influenced effective ICT transformation. In a quantitative study conducted by Ng (2008) on aspects of transformational leadership with 80 Singaporean secondary teachers, he found that a transformational leadership with qualities of identifying and articulating a vision, promoting acceptance of group goals, providing individualized support, offering intellectual stimulation, providing an appropriate model, creating high performance expectations, and strengthening school culture could influence the integration of ICT. Similarly, Afshari et al. (2009) distributed questionnaires to 30 heads of second-cycle institutions in Tehran. Their results revealed a relationship between the head's level of computer competence and transformational leadership practices.

The study concluded that transformational leadership could help improve the integration of ICT into teaching and learning processes. Further, Yuen, Law and Chan (2003) conducted case study of 18 schools in Hong Kong. They found that in catalytic integration model schools, the school principal is the key change agent, exhibiting visionary leadership, staff development and involvement while in cultural innovation model schools, multiple leadership is exhibited where the school principal is not necessarily involved in ICT leadership, and teachers are free to implement new ideas in supportive and enhancing culture. Also studies have shown that various levels of leadership such as principal, administrative leadership and technology leadership influence successful use of ICT in schools (Anderson & Dexter, 2005). This aspect of leadership will help the principal to share tasks with subordinates while focusing on the adoption and integration of technology in the school. Institutions exemplified by executive involvement and decision-making, strengthened by ICT plan, effectively adopt ICT integration curriculum.

Teachers' professional development is a key factor to successful integration of computers into classroom teaching. Several studies have revealed that whether beginner or experienced, ICT related training programs develop teachers' competences in computer use (Bauer & Kenton, 2005; Franklin, 2007; Wozney et al., 2006), influence teachers' attitudes towards computers (Hew and Brush, 2007; Keengwe and Onchwari, 2008) as well as assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008). Muller (2008) related technology training to successful integration of technology in the classroom. In a study of 400 pre-tertiary teachers, they showed that professional development and the continuing support of good practice are among the greatest determinants of successful ICT integration. Sandholtz & Reilly (2004) claim that teachers' technology skills are strong determinant of ICT integration, but they are not conditions for effective use of technology in the classroom.

They argue that training programs that concentrate on ICT pedagogical training instead of technical issues and effective technical support, help teachers apply technologies in teaching and learning. Research studies revealed that quality professional training program helps teachers implement technology and transform teaching practices (Brinkerhoff, 2006; Diehl, 2005). Lawless and Pellegrino (2007) claim that if training program is of high quality, the period for training lasts longer, new technologies for teaching and learning are offered, educators are eagerly involved in important context activities, teamwork among colleagues is improved and has clear vision for students attainment. Teachers may adopt and integrate ICT into their teaching when training programs concentrate on subject matter, values and the technology.

E-learning is wide and encompassing to the extent that it's hard to articulate a brief definition that actually defines the term concept. There may be other slightly different definitions, but Adeoti and Adebayo (2014) defines e-learning as the use of any electronic technology to help in the acquisition and development of knowledge and understanding in order to demonstrably and positively influence behaviors.

When teaching and learning in both classroom and out of classroom are electronically supported and facilitated, it is called e-learning. It is essentially technology based. Uhaegbu (2001) opined that it involves the use of computer and its devices to transfer and inculcate knowledge and skills.

So far, it has not been well ascertained if considerable numbers of the lecturers are competent to carry on with this great task of integrating ICT into instructional delivery as there are few records. The trend of record of low use of ICT in teaching and learning processes by teachers is not limited to secondary schools alone but rampart among lecturers of higher institutions of learning. This has been the subject of major concern to educational planners, administrators, stakeholders in education and teachers themselves. In support of this, Yusuf and Balogun (2011) revealed that there was wide gap between policy development and implementation in the Nigeria schools as regards computer education. Researchers such as Osakwe (2010) worked on the influence of Information and Communication Technology on Teacher Education and professional development in Delta State and revealed that there was no significant relationship between ICT and lesson presentation which could be due to lack of information literacy in teacher trainers. Also, Nwana (2012) studied the challenges in the application of e-learning by secondary school teachers in Anambra State and concluded that inadequacy of e-learning infrastructure posed a major challenge for teachers' non-use of e-learning in classroom and that the available ones are not utilized because the teachers lack the knowledge and skills of computer application.

Previous research in related studies pointed out many factors that account for non-use of ICT tools in schools. Some of these researchers concentrated on the secondary schools and universities (Osakwe, 2010; Nwana, 2012; Afshari, Bakar, Luan, Samah, & Fooi, 2009). Other studies (Horton, 2005; Franklin, 2007; Dalsgaard, 2008) were based on foreign countries. However, most of these studies have left out institutional factors in relation to colleges of education where these teachers are produced especially south-west, Nigeria. This might be due to the piecemeal approach to the research into academic achievement in the colleges of education in the country. This gap in knowledge should not be allowed to continue uninvestigated if the country is to achieve the educational objectives of producing qualitative graduates to power the Nigerian economy.

The quality of output of any operation is a function of the input that is processed. Consequently, the quality of output of primary and secondary teachers depends, to a large extent, on the quality of teacher educators in colleges of education. The gap identified by the researcher is that none of earlier researchers traced the teachers' poor use of ICT to institutional factors. To fill these identified gaps, the study examined institutional factors as predictors to colleges of education lecturers' versatility levels in e-learning in south-west, Nigeria. Two research questions guided the study.

Research Questions
What is composite contribution of institutional factors to the prediction of lecturers' versatility level on e-learning in colleges of education in South-west, Nigeria?
What is the linear contribution of institutional factors to the prediction of lecturers' versatility level on e-learning in colleges of education in South-west, Nigeria?

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Methodology

The study specifically focused on the institutional factors as predictor of colleges of education lecturers' versatility level in e-learning in South-west, Nigeria. Hence, a descriptive survey research design was adopted. The study was carried out in all government owned Colleges of Education in the South-west, Nigeria. There are seven State Colleges of Education and four Federal Colleges of Education making up eleven government-owned Colleges of Education that were examined in this study. Lecturers in all government owned Colleges of Education in Southwest States of Nigeria were selected for the study. Simple sampling technique was used to select available academic staff from each of the colleges of education in South-west, Nigeria for the study. A structured questionnaire titled "Questionnaire on institutional factors as predictor colleges of education lecturers' versatility level" was used to elicit information from the samples selected. The questionnaires were administered to members of academic staff in each of the sampled Colleges of Education. The data collected were analyzed using inferential statistics (multiple regression and ANOVA to answer the research questions

Results

What is composite contribution of institutional factors to the prediction of lecturers' versatility level on e-learning in colleges of education in South-west, Nigeria?

To test for composite contribution among predictors variables of capacity building, E-learning conception, E-learning facilities availability, institutional strategies and government policy on criterion variable versatility level as indicated in research question one, the multiple regression analysis was carried out using the enter method. The results derived from the analysis are shown in Tables 1 and 2.

Table 1:

Adjusted R square value for the model summary on versatility.

Model	R	R Square	Adjusted R Square	Std. error of the estimate
1	.469	.22	.21	.52

a. Predictors: (constant). Capacity Building Government Policy, Institutional Strategies, Facilities availabilities and Conception.

From the result in Table 1, the Adjusted R Square (.21) has poor fit. This revealed that the constructed multiple regression model of the independent variables (capacity building government policy, facilities availability, institutional strategies and conception) account for .21% variance in the dependent variable (versatility level). The results on the analysis of variance (ANOVA) for the model are as shown in Table 2.

Table 2:

ANOVA for independent variables on Versatility Level.

Model	Sum of Squares	Df	Mean square	F	Sig.
Regression	80.93	5	16.19	59.39	.00[b]
Residual	294.88	1082	.273		
Total	375.805	1087			

a. Dependent variable: Versatility
b. Predictors: (constant), capacity building, government policy, infrastructure availability, institutional strategies and conception.

The results of the analysis of variance (ANOVA) which revealed that F (df 5, 1082 = 59.39, P < 0.00, indicated a statistically significant relationship (stronger than 0.05) among the independent variables (capacity, policy, infrastructure, institutional strategies and conception) and dependent variable (versatility). Based on this significant relationship, the coefficient for the Beta weight for the amount of standard deviation unit of change in the dependent variable for each standard deviation unit of change in the dependent variable was calculated.

What is the linear contribution of institutional factors to prediction of lecturers' versatility levels in e-learning in colleges of education southwest, Nigeria?

To test for linear contribution among predictors variables of capacity building, E-learning conception, E-learning facilities availability, institutional strategies and government policy on criterion variable versatility level as indicated in research question two. Table 3 showed the Coefficient of independent variables on dependent variable e-learning versatility levels.

Table 3:

Coefficient of independent variables on Versatility

S/N	Model	Unstandardized coefficients		Standardized Beta	Coefficients T	Sig.
		B	Std. error			
1.	Constant	-.858	.18	-.003	-4.69	00
	Conception	-.005	.05	.20	-.10	.92
	Govt. Policy	.249	.041	.159	6.13	.000
	Infrastructural Availability	.263	.061	.127	4.32	.00
	Institutional strategies	.153	.045	.106	3.38	.001
	Capacity building	.249	.038	.210	6.55	.00

a. Dependent variable: versatility

The standardized coefficients in Table 3 revealed that (a) the independent variables, capacity building value has the strongest positive effect on versatility because the Beta (B=.21, .00) shows statistically significant relationship because the significant value was less than 0.05 alpha value.

Discussion of the findings

The composite and linear contributions among COE lecturers' conception, government policy, availability of e-learning infrastructure, institutional strategies and capacity building in e-learning versatility Levels

The composite contribution of institutional variables among COE lecturers' conception, e-learning infrastructure, institutional strategies and capacity building in e-learning in versatility levels was examined by research question 1. The result of the regression analysis established a significant relationship among e-learning versatility level (dependent variable) and their conception on e-learning, e-learning government policy, availability of e-learning infrastructure, institutional strategies and capacity building (independent variables). Therefore, its shows that institutional factors influence teachers' adoption and integration of ICT into teaching. And that Teachers' professional development is a key factor to successful integration of computers into classroom teaching. Several studies have revealed that whether beginner or experienced, ICT related training programs develop teachers' competences in computer use (Bauer & Kenton, 2005; Franklin, 2007; Wozney et al., 2006), influence teachers' attitudes towards computers (Hew and Brush, 2007; Keengwe and Onchwari, 2008) as well as assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008).

These findings on composite and linear contributions of institutional factors on colleges of education lecturers agreed with findings of Yee (2008) who believed that a leader who implements technology plans and also shares a common vision with the teachers stimulate them to use technology in their lessons. Schaffer and Richardson (2004) suggest that for effective utilization of ICT by teachers, there is the need for a strong leadership to drive a well designed technology plans in schools and bring about capacity building for the lecturers. The lack of computer training could lead to cyber phobia that according to Agbatogun (2010) is likely to limit their use of ICT. Smarkola (2007) points out that teacher training in ICT are vital for future conception and uses of computers for teaching and learning process. However, for proper ICT integration in education, the quality of training needs to be taken into account.

Conclusion

The building of the physical infrastructure as well as the knowledge infrastructure base such as teacher training, teaching materials and internet facilities are necessary before the full benefits of the e-learning educational investments can be realized. The development of these infrastructures is noted to be at low realm in almost all colleges of education in the country. The findings of this study revealed that the colleges of education are experiencing critical challenges such as poor infrastructure, a lack of teachers' exposure to training and retraining on ICT usage

Recommendations

Based on the findings and conclusion of this study, the following recommendations were made;
1. Government should organize more seminars, workshops and conferences in and outside the country for lecturers on e-learning for effective instruction in colleges of education.
2. College management should allocate both financial and material resources in such a way that will promote professional development of lecturers thereby providing sustainable overall institutional development of technical skills and versatility needed for e-learning.

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PROMOTING QUR'ANIC RECITATION THROUGH MODERN TECHNOLOGY AND MEDIA

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Abstract
The twenty first century is the period of advancement of science and technology which make things easier and faster. Science and technology are very relevant in the field of transport, medicine, communication and education. This paper examines the values of technology and media in the recitation of the Glorious Qur'an in the teaching and learning process. The values of audio, visual and audio-visual instructional materials such as radio, television, Qur'an Learning Pen and others help directly or indirectly to the understanding of Islamic Studies especially in the area of Qur'anic recitation. The paper recommended among other things that there is the need for Muslims to invest in Qur'anic education, as it has enormous reward in the hereafter.

Introduction
Some people wrongly think that religion (Islam) does not relate to science and modern technology or that since it is an art subject, it does not require any aspect of technology in the teaching/learning process. The Qur'an is not a book of science, but some of its verses relate to modern science and predict that a time will come in human history when Allah (SWT) will equip mankind with the knowledge of different aspects of science and technology. This clearly indicates that while Islam emphasizes on the life to come (hereafter), it at the same time recognizes the worldly needs of man. The Qur'an states:
And He created the horses, mules and donkeys for you to ride and (as) adornments, and He creates that which you do not know. (Q16:8).

The above verse points out the benefits of creating some animals and at the same time indicate that He (Allah) creates what we do not know. Some scholars have express divergent views on the last phrase of the above verse….. *And He creates that which you do not know* to mean that Allah equips man with the knowledge of inventing different things such as motor cars, earoplanes, ships, television, radio, tape recorders and other things which are part and parcel of the modern technology. This paper aims at expounding the ways of promoting Qur'an education (with particular reference to the recitation of the Glorious Qur'an) in our schools.

The Concept of Technology and Media
Hornby (2000) defines technology as the application of scientific knowledge to practical tasks in industry in a systematic manner. According to Gem (1995), technology is the application of practical mechanical sciences to industry and commerce. It has to do with technological methods, skills and knowledge.
West, M. (1978) defines media as a means of giving information. The media system which is very effective in the teaching-learning process may be in form of electronic (such as loud speaker, radio, tape recorder, computer, projectors, etc) and the print media (such as text books, journals, conference papers, magazines, newspapers), etc.

The Science of Qur'anic Recitation and its Benefits
The recitation of Qur'an is very fundamental to the life of every Muslim men and women. The Prophet (S.A.W) stated that seeking the knowledge of tajwid (Qur'anic recitation) is sunnah (something established as a legally binding precedent in addition to the law established by the Qur'an, but applying its rules is compulsory on individual Muslims, especially during the performance of prayer. Proper application of Qur'anic recitation is very significant in that:
The Almighty Allah (SWT) enjoins the Muslims to recite it as the early Muslims were taught, i.e according to how it was initially revealed to the Prophet (S.A.W).
Proper recitation of the Qur'an is a supererogatory act in Islam that attracts enormous reward. Each letter of the Qur'an that is properly recited attracts ten goods deeds.
It enables Muslims to avoid committing obvious mistakes that are tantamount to changing the real meaning of the Qur'an. Doing this attracts severe punishment.
The correct recitation of Qur'an is a mode of *Dhikr* (remembrance of Allah) which makes a Muslim to move closer to Allah and find ease and tranquility especially when in difficulty, among other significance.

The Relationship Between Qur'anic Recitation, Technology and Media
In Islam, there are basically five issues that subsumes the entire aspects of a Muslim's life. These include matters related to faith, matters related to practical devotion, matters of contracts, matters of expiation and matters of application of punishments. The Qur'an contains different verses on the above five categories of the legislative code that cannot be altered in any way and circumstances.

To perform pilgrimage at Makkah, which is a pillar of Islam is compulsory for a matured Muslim who has the means to do so. In the olden days, some Muslims went to Makkah by trekking or using various animals like donkeys, horses, camels and others for conveyance. In modern time, aeroplanes, motor cars and other means of transportation systems are used due to their convenience. The Qur'an says:

Say; "Who has forbidden the adornment of (i.e from) Allah which He has produced for His servants and the good (lawful) things of provision? Say "they are for those who believe during worldly life (but) exclusively for them on the day of resurrection… (Q7:32).

The inventions of so many things as a result of science and technology help the Muslims to understand their religion better and has brought comfort, convenience or promotes the religion. The use of microphones in our mosques which is regarded as a good innovation helps the Muslims to be conscious of the times of prayer and attend same as they are being reminded. We use radio, television and other media to educate Muslims on different aspects of their life. Through the printing press that became possible as a result of science and technology, we get voluminous copies of Qur'an, *Ahadith, Fiqh* and other books that we use to learn and teach others in line with the instruction of the Prophet (SAW) that we should extend his message (Islam) to others.

In line with the above examples and many more, we can promote the teaching of Qur'anic recitation through modern technology and media by using various means that help in one way or the other to better understanding of the skills of recitation and memorization. In summary, the Qur'anic recitation can be promoted through the use of audio, visual and audio-visual teaching aids in the teaching-learning process.

The Use of Audio Aids in Teaching Qur'an
Audio or aural aids are simply defined as those aids that can be listened to by students and the teacher to facilitate easy teaching and learning. Examples of audio-aids include the tape recorder, radio and record player. The paper will concentrate on the first two audio aids.
Tape Recorder:
The tape recorder is a mechanism which uses a thin, plastic and flexible ribbon. It has a shiny and dull side. The dull side is the side on which the recording is done. Teachers of tajwid (Qur'anic recitation) can use tape recorders to teach their students the skills of Qur'anic recitation and memorization as well. The merit of tape recorder is that the user (teacher) can do the recording of what he wants the students to listen to. The most notable value of tape recorder is that it can be played over and over again, till the learner is able to master the required item. The teacher of tajwid may use single tape recorder to record many chapters or verses of the Qur'an to be learnt. If properly recorded and kept, the cassettes may be used at different interval of times for the teaching of Qur'anic recitation. Tajwid teachers can use tape recorders to teach the slow learners who can be made to listen to what has been taught over and over. Another advantage of tape recorder is that the teacher (programmer) can improve on his voice by listening to it (the tape recorder).
Aminu (2012) highlights that cassettes that have served their purpose can be erased and new things can be recorded on them again to serve another purpose. On the other hand, tape recorder is a comparatively new teaching device in schools especially with Islamic Studies subject. It has the following advantages according to Farrant (1988):

1. The tape recorder is cheap to afford compared with other teaching aids such as the projector, films etc.
2. It is simple to operate.
3. It can be used at any time, any where because it functions with the use of electricity or battery.
4. The tape recorder can record and play back any sound.
5. Errors may be re-corrected without waste of time.
6. The tape can replay, reverse or edit as many times as possible.
7. The tape recorder can be stopped mid-way to allow for discussion or to answer questions or clarification of certain point during a lesson.

How to Effectively Use Tape Recorder
There are some guiding principles that need to be considered when teaching the science of Qur'an through the use of tape recorder, such as the following:
The chapter(s) or verses to be taught should be properly recorded before going to teach the students.
Light should be available before teaching the students, otherwise battery should be used instead.
The teacher should ensure that his students sit where they can listen to the audio aid (tape recorder) clearly. The volume of the tape recorder should be loud enough, but not to loud to a noisy state.
There should be conducive place (classroom) in which the tape recorder can be used, otherwise students' attention would be distracted and therefore the objectives of the lesson may not be achieved.
Before operating the tape recorder, the teacher should give students sufficient background information, otherwise they will not have a foundation on which to build their understanding.
The presence of teacher is highly needed when the tape recorder is turned in, otherwise some students may disturb others.
The tape can be adjusted by the teacher when it is faulty.

When the tape is on, the teacher is expected to write some important things for further explanation to students after listening to whatever chapter/verse being played.
Steps in Teaching Recitation through Tape Recording
1. When the teacher teaches a particular chapter or verse(s) from the Qur'an using tape recorder, he should adopt the following steps:
2. The chapter/verses to be taught as programmed in the tape recorder should be played over and over (at least thrice) for students to listen to.
3. The teacher may explain some places and or repeat some verses while the students listen to him carefully.
4. Students should be instructed to recite the verse or chapter to the hearing of the teacher.
5. Some groups may be instructed to recite the chapter/verses while others listen to them with guidance of the teacher.
6. Individual students could be picked by the teacher to recite the chapter or verse(s) to the hearing of others. This may serve as evaluation.

The Use of Radio Programme in Teaching Qur'anic Recitation
The radio is a mechanism which uses sound waves to produce immediate pre-recorded information from a radio broadcasting station. The significance of radio programmes in education especially in recent years cannot be over emphasized. Some radio stations in Nigeria today at federal and state levels have in their daily programmes schedules that are highly educative. Programmes are organized to teach English, Geography, Biology, Physics, Hausa, Islamic Studies and other subjects. The use of radio for educational programmes is still in its infancy stage in this country. Teachers should try to make the best use of it due to the benefits derived therein. (Agang, 1988).
The teacher of tajwid may us Radio programme in order to teach some students by coming to the class with the radio and ensuring that the time of the lesson correspond with the scheduled radio programme. The teacher should not totally rely on what is presented on the radio, instead he should teach the students well and allow them to ask questions at the end of the programme. In order to succeed when using the radio programme in teaching Tajwid lessons, the teacher should be guided by those steps earlier mentioned when using tape recorder in the learning process. The merit of radio in teaching Tajwid is that it helps to motivate the students and preserves the energy of the teacher and gives students a sense of something new, than the teacher's voice.

The Use of Microphones
Microphones can be used also to teach Qur'anic recitation, by following these steps:
Reciting the Qur'an thrice by the teacher, using the microphone.
Reciting and asking the students to follow the teacher when reciting (at least thrice)
Asking them to recite group by group or row by row in the class.
Some students should be selected to recite individually.

The Use of Audio-Visual Aids in Teaching Qur'anic Recitation
Audio-Visual Aids could be defined as those aids that can be seen and heard by the students. Through educational research according to Agang (1988) it has been discovered that students remember about 10% of what they read, 20% of what they heard and about 50% of what they hear and see. The importance of audio-visual materials in the teaching-learning process cannot be over emphasized. It makes the students to retain what they have learnt as they become involved in the learning process, hearing, seeing and practicing by themselves. Examples of the audio-visual aids that can be used to teach Islamic studies include films, television, video cassettes, computers and Qur'an Learning Pen (QLP). In order to teach the science of Qur'anic recitation, three of the examples of audio-visual aids, namely television, computers and Qur'an Learning Pen could be used
.
Teaching Qur'anic Recitation Through Television
The television is a mechanism that receive and show telecasted events through waves on a screen. The telecasted events can be pre-recorded or can be watched as they take place. Television is an example of the audio-visual aids that are used in the developed countries. In developing countries, many problems ranging from lack of constant power supply, cost and scheduling hinder the use of television in the learning process (Agang, 1988).
There are basically two types of television programming the open circuit (the telecast done for public consumption) and the closed circuit (is the type made for special and private consumption). The second type is used in developed countries for telecasting educational programmes by different institutions of learning.
Islamic Studies teachers especially in the developed countries may programme lessons on how to teach the recitation of Qur'an to their students at different institutions of learning. Students through watching the pre-recorded programme on Qur'anic recitation would be able to see and hear how recitations are made, using different styles. At the end of the programme, they can ask questions to their teachers.

Islamic Studies Teacher and the Computer Technology

Computers are widely used in the teaching and learning process in developed countries of the world. Computers are machines that are designed in such a way that they can be fed with information and can reproduce such information accurately faster than the human being. Nigeria is yet to be fully involved in the use of computer machines for her educational programmes.

Agaji (2010) opines that the modern and up-to-date Islamic Studies teacher is the one who is computer literate. This is because the old method of tapping information and passing on knowledge is now modernized by innovations in technology which makes it easy to access strong and reliable knowledge by the push of the button.

Computer applications which are provided in different form in everyday activities can be used by an Islamic studies teacher, since he is always in search of knowledge and new findings. Soft ware of computer is the best medium to seek assistance according to Babajo (2004). The areas in computer applications that can be used by Islamic studies teachers among others include office automation such as word-processing and desktop publishing. Other areas of applications include educational activities (which enhances the productivity of teachers and students), the CD Rom and the Internet services available in the computer programs. Teachers of Islamic studies and other disciplines are in greater need of the internet service due to the fact that latest books, published journals, conference papers that are presented at national and international levels are at the disposal of the teacher with a press of button.

The Teaching of Qur'anic Recitation through CD Rom

The CD Rom can be effectively used by Islamic Studies teacher when teaching the science of Qur'anic recitation. He can do so by getting the programmed Qur'anic chapters on CD plates which can be played during the lesson of tajweed using the following steps:

The CD Rom can be played in a noisy free area, particularly the classrooms, lecture halls and or language laboratories under the supervision of the teacher.

The CD plates can be played over and over (at least thrice) while the students listen attentively.

The students may be instructed to recite the chapters/verses of the Qur'an after turning down the computer on group basis and individually.

The teacher is expected to listen carefully to the recitation of the students and if need be correct them if they commit mistakes.

Students may be given assignments on some Qur'anic chapters/verses on different rules of Qur'anic recitations like Izhar (clear pronouncements or reading), Idgham (assimilation), Iqlab (depolarization), Ikhfah (suppressed pronunciation) and other rules. Teaching the science of Qur'anic recitation by using CD Rom in a computer helps to motivate students by capturing their attention and arousing their interest. The reading ability is being improved since they practice on their own using the computer even without the presence of the teacher.

The Use of Mobile Phones

The teacher of Islamic Studies can use mobile phone to teach the recitation of some verses and chapters of the glorious Qur'an. He can do this by pre-recording the verse/chapters he recited, with full application of *Tajwid* rules such as *Izhar* (clear recitation), *Idgham* (assimilation), *Iqlab* (depolarization), *Ikhfa* (suppressed recitation), among other rules. During the *Tajwid* lessons, such pre-recorded verses and or chapters can be played over and over for the students to listen attentively for sometimes, and the teacher explains the rules of the recitation.

The Use of Qur'an Learning Pen

The Qur'an Learning Pen (QLP) is an amazing technology that makes Qur'an reading, learning, understanding and memorizing very easy. No matter one's level of Qur'an reading, one will benefit from this amazing device. The young and old, Arab and non-Arabs, beginners or masters, the Qur'an Learning Pen is a device that will make them wonder how they ever live without it.

Simply by touching the pen on any ayah (verse), Surah (chapter) or page, the pen will start to read in a loud and clear sound. The merit of this reading pen is that it helps to improve reading skills of all learners and maintains the flow of reading as students and non-Arabic people encounter unfamiliar words.

According to www.quranlearningpen, one can use the Qur'an Learning Pen as it is printed in beautiful Uthmanic fonts and pages are layered with invisible grids. The learning pen optically detects each unique code on the grid and will read the corresponding verse, chapter or page in a beautiful digital sound. When the Qur'an Learning Pen is pointed at the beginning title of each chapter or verse, it will read the whole corresponding chapter or verses word by word. This provides a very convenient way to learn, memorize and recite the Qur'an, all in just 3 easy steps-pointing, listening and reciting.

The Qur'an Learning Pen helps to promote the learning of Qur'anic recitation in that the teachers may teach the students by using different *qira'at* (recitations) made by different *Qurra* (Qur'anic reciters), such as Al-Basit, Al-Menshawy, Al-sudaisi, Al-Husry, Al-Hudhaify, Jabir and other noteable reciters who use different modes of *Qira'ah* (recitations) like Hafs, Warsh, Qunbul, Qatun and others.

Learning the recitation of the Qur'an through this device helps to arouse and sustain the interest of students and enable them to memorize Qur'an very easily.

Challenges of Using Some Electronic Devices in Teaching/Learning of Tajwid

1. Unstable electricity supply grossly affects the use of electronic devices in teaching Qur'anic recitation. To effectively use the devices, schools and o r teachers have to generate the needed power supply of their day-to-day running through industrial generating set. This will require huge amount of money
2. Low level of literacy among, teachers and students of Islamic Studies: The low level of technical knowhow of teachers and students can affect successful use of some electronic media such as computer, mobile phones, and Qur'an Learning Pen etc.
3. Funding: Another challenge on the use of electronic media especially the computer is the problem of funding on the part of government, institutions and parents. It is difficult to provide enough computers in some schools, especially in the remote areas.

Recommendations

In order to promote Qur'anic recitation through modern technology and media, it is recommended that:

1. The teacher should be computer literate and master his subject matter very well.
2. Government should provide the basic instructional materials that can be used in the teaching of all subjects in schools, colleges and universities.
3. Training and retraining of teachers in all disciplines should be given periodically for them to be up-to-date.
4. Qur'anic recitation competitions should be organized at local, state, national and international levels.
5. The Glorious Qur'an should be properly handled by Muslims

Conclusion

The teaching of Qur'anic recitation through modern technology and media as it has been established in this paper will help greatly in promoting the recitation of the Qur'an. Through the use of audio, visual and audio-visual aids as shown in the paper, the interest and attention of the students/pupils could be aroused and sustained. In order to do that successfully, government, non-governmental organization and individual Muslims should contribute and invest in the field of Qur'anic education and other areas of Islamic studies.

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LECTURERS' PERCEPTION ON THE UTILIZATION OF BLENDED LEARNING FOR INSTRUCTION IN SELECTED COLLEGES OF EDUCATION IN NORTH-EAST, NIGERIA

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Abstract

Blended learning is an instructional strategy that requires the use of online and traditional face to face pedagogies in teaching-learning activities. In spite of its benefits, they are challenges inhibiting its utilization. This study therefore examines lecturers' perception on the utilization of blended learning for instruction in selected Colleges of Education in North-east, Nigeria. The population for this study comprised all lecturers in all Colleges of Education in North-east, while 170 lecturers were randomly sampled from two selected Colleges of Education in North-east. Descriptive survey research type was adopted and a 4-point Likert scale questionnaire was used. Four research questions and two hypotheses were answered and tested using mean and t-test statistics respectively. The sampled lecturers were further stratified along gender. The instrument used for the study was the researcher designed questionnaire tagged "Questionnaire on Lecturers' Perception on Blended Learning Utilization for Instruction". The findings revealed amongst others that; blended learning has tremendous use for instruction with the mean rating of 2.73 and using 2.5 as the bench mark. There was no significant difference between the perception of male and female lecturers in the usefulness of blended learning for instruction. In conclusion, blended learning was found to be meaningful, productive, interactive and an individualized learning tool. It was recommended amongst others that blended learning strategy should be fully integrated, since it has tremendous roles on the teaching-learning process, irrespective of gender.

Keywords: Information and Communication Technology; Blended learning, College of Education; Perception; and Gender.

Introduction

The word perception is derived from the Latin word *percipio* which means receiving, gathering, and action of taking control with the mind. Perception refers to the process of explaining sensory impression into an integrated study of the world with the existing situation. It is likened with authenticity for most practical determinations and leads human behaviour in general (Amosa, Ogunlade, Ogunlade & Obielodan, 2016).Perception of lecturers towards the utilization of blended learning for instruction can give some evidences about its relevance in instruction. Therefore, perceived usefulness of blended learning for instruction is the lecturers and other users believe in its importance in instruction while its ease of use relies on the level of its stress free during utilization.

The application of Information and Communication Technology (ICT) in educational activities has presented a laudable achievement in innovative strategies such as blended learning. For instance, ICT promotes student-centered approach and do away with teacher-centered method (Elmaifi, 2014). In the same vein, Olorundare and Upahi (2013) stated that ICT is a major tool for advancing educational activities and research in developing countries most especially in the cyber technical dispensation. Therefore, where ICT facilities are available, teachers should thrive and be encouraged to integrate and make appropriate utilization of the resources for effective teaching and learning activities. In this age of technological advancements, digital facilities such as computers, audio-visual and online resources are increasingly replacing traditional teaching methods.

Information and Communication Technology (ICT) is the act of processing, transmitting and retrieval of information via electronic devices. Nuhu (2013) viewed ICT as information handling devices that are used for producing, storing, processing, disseminating and exchanging information. ICT enhances learning and bring certain changes in the way information is presented to the students and every aspect of human activities including education. Traditionally, classroom environment is teacher-centered where teacher dominates the affair of the class through the use of chalk and talk approach with little or no instructional aides (Funso, 2004). Hence, students should be encouraged to interact with the learning situation, ask questions and facilitate their understanding thoroughly (Arzel, 2012). These types of classes involve rote learning where students depend largely on memorization without having a complete understanding of what is being taught. Consequently, traditional approach is counter-productive to producing healthy, well-educated and well-rounded adult learners most especially when it comes to the issues of students and education (Gupta, 2012). Teachers in this situation are unequipped to manage and deal appropriately with student weaknesses in the learning process. On their parts, students usually become frustrated and disturbed as they are made to be only the receivers of the information.

In view of the above explanation, one can deduce that traditional approaches follows a normal routine of conventional chalk and talk method in collaboration with simple instructional materials that are available for the teacher (Arzel, 2012). Online learning on the other hand is the integration of technological devices and other specially designed online learning resources to enhance the teaching and learning process.

The integration of these two strategies is referred to as blended learning strategy. Blended learning is a means of solving educational problems through the integration of online learning and traditional learning strategies with the involvement and full participation of learners in teacher-student interaction in learning experiences.

Mersal and Mersal (2014) described blended learning as a technique of teaching that requires the use of two or more complementary approaches to teach the same material or content. This could be done by combining traditional method, discussion, activities and web based modules or any learning that combines online and face-to-face approaches (Akyuz & Samsa, 2009). Teachers can monitor the class discussion by means of online form which will assist them in identifying topics or concepts that require clarification. The advancement in educational technology has in no small measure affected the practice of teaching and learning in schools and makes students active in the learning process. The most effective teachers' use a variety of methods and approaches to assist his students in the learning process (O'Day, 2008).

Similarly, there is no instructional method that is solely considered as the best and all the new instructional strategies can best be described as additional supplements to traditional instructional approaches rather than the substitutes. The efficacy of every instructional strategy would depend upon the teacher's personal and professional competence, creativity, perseverance, determination and the environment to which the selected instructional strategy would be used. Teaching and learning could be enhanced when instructors expose learners to innovations in addition to conventional approaches (Abimbola, 2015). Therefore, teachers make use of online learning experiences in addition to conventional teaching method to enhance learning through blended learning.

The popularity of blended learning as a new approach to teaching and learning process is rapidly increasing. Blended learning scintillated to emerge as one of the most popular instructional strategy in the 21st century (Cuzer & Caner, 2014). This is because in the contemporary society, with the explosion of knowledge and innovations in technology, students used to access information digitally. Thus, blended learning programmes are significant instructional opportunities that the school should not miss (Ferriman, 2015). Integration of online and conventional learning strategies might be considered useful for solving and meeting the educational problems and needs respectively (Murphy, 2003).

Therefore, there is need for educational institutions to train their teachers on technology integration for effective instructional delivery in schools. For instance, research evidence revealed that some institutions of higher learning are making effort to reduce costs and upgrade their quality of teaching for large classes, in this situation, blended learning strategy would be a gorgeous alternative of technology integration for instructional activities (Marsh, George, McFadden, Price & Jo, 2003).Blended learning implies a means of meeting the task of modifying learning and improvement to the individuals' desires by incorporating the innovative learning experiences received from online with the collaboration and involvement offered in a conventional learning strategy (Shantakumari & Sajith, 2014).

Gender is a factor in all aspects of teaching-learning process, thus blended learning as a learning strategy is user friendly to both male and female lecturers. Meyer (2003) reported that differences existed in gender similarly in both online learning and conventional learning strategies. Hence, males are inquisitive, fully involved in questions, discussions, optimistic, and remain active participants, whereas females were more submissive. Despite the contributions of blended learning strategy to the meaningful and productive learning, there are challenges to its integration to the teaching-learning process. However, the major barrier to its implementation is the users' attitude and commitment towards the integration of technology into the teaching-learning setting, thus this task could discourage the utilization among the users (Hofmann, 2014).

Purpose of the Study
The purpose of the study is to determine the lecturers' perception on the utilization of blended learning for instruction in selected Colleges of Education in North-east, Nigeria. Specifically, the study is to:
1. Determine the lecturers' perception on the usefulness of blended learning for instruction.
2. Examine the lecturers' perception on the ease of utilization of blended learning for instruction.
3. Determine the lecturers' perception on the usefulness of blended learning for instruction based on gender.
4. Determine the lecturers' perception on the ease of use of blended learning for instruction based on gender

Research Questions
1. What is the lecturers' perception on the usefulness of blended learning for instruction?
2. What is the lecturers' perception on the ease of utilization of blended learning for instruction?
3. What is the lecturers' perception on the usefulness of blended learning for instruction based on gender?
4. What is the lecturers' perception on the ease of utilization of blended learning for instruction based on gender?

Research Hypotheses
Ho$_1$: There is no significant difference between male and female lecturers' perception on the usefulness of blended learning for instruction
Ho$_2$: There is no significant difference between male and female lecturers' perception on the ease of use of blended learning for instruction

Methodology
The population for this study made up of all lecturers in all Colleges of Education in the North-east, Nigeria, while 170 lecturers were randomly sampled from Bauchi and Yobe States Colleges of Education. The instrument for this study was a researcher designed questionnaire titled "Questionnaire on Lecturers' Perception on Blended Learning Utilization for Instruction" in selected colleges of education in North-east, Nigeria. Descriptive survey research type was adopted, using the 4-point Likert scale response modes: Strongly Agree (SA = 4), Agree (A = 3), Disagree (D = 2) and Strongly Disagree (SD = 1). Four research questions and two research hypotheses were answered and tested using mean rating and t-test statistical tools respectively. The total calculated mean score is four on each variable responded to, thus 2.5 was considered as the bench mark. Frequencies were converted to mean in the research questions one and two while research questions three and four were answered through the corresponding hypotheses one and two. Thus, hypotheses one and two were tested using t-test at (0.05) level of significance.

Results
Data obtained in respect of research questions were analyzed using mean and t-test for the research hypotheses.

Table 1:
Distribution of Respondents by Gender

Lecturers	Frequency	Percentage (%)
Male	116	68.2
Female	54	31.8

Table 1 indicated that (116) 68.2% were male lecturers in all the sampled respondents while (54) 31.8% of them were female lecturers.

Research Question 1: What is the lecturers' perception on the usefulness of blended learning for instruction?
Table 2:
Lecturers' Responses on the Usefulness of Blended Learning for Instruction

S/N	Statements	Mean
1.	I normally get detailed explanation from the textbook than searching anywhere else from the web.	2.46
2.	The use of blended learning strategy for instruction would motivate learners and facilitate better understanding.	3.12
3.	The quality of my instruction would be improved when blended learning strategy is fully integrated.	3.19
4.	Student-teacher relationship improves when blended learning strategy is fully integrated in teaching.	2.95
5.	Blended learning strategy is tiresome; therefore traditional pedagogy is more of an alternative method for instruction.	2.42
6.	I use blended learning strategy for instruction because it enables me interacts with my students and technology at the same time.	2.77
7.	The use of blended learning strategy for instruction would enable me cover the course contents within the time frame of the college.	2.85
8.	Blended learning strategy supports learning experiences that are collaborative and improves technological awareness.	2.86

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9. I think blackboard is sufficient enough for instruction, no need of blending with Online resources and other technology related tools. — 2.30

10. Blended learning strategy is an addition to traditional method, but not a substitute. — 2.69

11. I prefer textbook than blending with other digital technologies. — 2.47

Grand Mean — 2.73

Based on the results in Table 2, the findings reveal that lecturers in the two Colleges of Education agreed that the blended learning has tremendous use for instruction with the mean rating of 2.73, using 2.5 as the bench mark. There is an indication from the responses in items 1–11 that the use of blended learning affords meaningful and productive learning. Research Question2: What is the lecturers' perception on the ease of utilization of blended learning for instruction?

Table 3:
Lecturers' Responses on the Ease of Utilization of Blended Learning for Instruction

S/N	Statements	Mean
1.	I would find it easier to teach my students with blended learning strategy	3.27
2.	Blended learning strategy is easy to utilize for instruction.	3.08
3.	Blended learning strategy makes my teaching job better and faster.	2.95
4.	Blended learning strategy is user friendly.	2.90
5.	The flexibility of blended learning strategy would ensure speedy dissemination of information to students.	2.98
6.	With all the associated factors of internet facilities and poor network coverage, I would do all my best to integrate blended learning strategy for instruction.	2.80
7.	I will advocate for the use of blended learning strategy in education due to their relevance and convenience.	2.83
8.	My interaction of blended learning strategy is quite understandable for teaching-learning activities.	2.78
9.	It is easy to become skillful, if blended learning is fully integrated.	2.76
	Grand Mean	2.93

Based on the results in Table 3, the findings reveal that lecturers in the two Colleges of Education agreed that the use of blended learning for instruction is user friendly and stress free with the mean rating of 2.93, using 2.5 as the bench mark. There is a hint from the responses in items 1–9 that the use of blended learning affords ease of use.

Ho$_1$: There is no significant difference between male and female lecturers' perception on the usefulness of blended learning for instruction

Table 4:
Perception of Male and Female Lecturers on the Usefulness of Blended Learning for instruction.

Variable	No	Mean	Std. deviation	Df	t-value	Sig.(2-tailed)	Remarked
Male	116	2.837	.371		2.718		
				168		0.117	Accepted
Female	54	2.922	.306				

NS - Not Significance at $p > 0.05$

From Table 4, analysis established that the t-value = 2.718, with p-value of 0.117 > 0.05 alpha level. This implies that the null hypothesis one, which states that there is no significant difference between male and female lecturers' perception on the usefulness of blended learning for instruction showed no significant difference. Hence, the hypothesis was accepted.

Ho$_2$: There is no significant between male and female lecturers' perception on the ease of use of blended learning for

Table 5:
Perception of Male and Female Lecturers on the Ease of Use of Blended Learning for Instruction

Variable	No	Mean	Std. deviation	Df	t-value	Sig.(2-tailed)	Remarked
Male	116	3.54	.23		14.62		
				168		0.00	Rejected
Female	54	3.34	.18				

NS - Significance at $p < 0.05$

From Table 5, analysis established that the t-value = 14.62, with p-value of 0.00 < 0.05 alpha level. This implies that the null hypothesis two, which states that there is no significant difference between male and female lecturers' perception on the ease of use of blended learning for instruction established the significant difference on their opinion regarding the ease of use. Hence, the hypothesis was rejected.

Summary of Major Findings
Based on the analysis of students' responses, it was revealed that:
1. The use of blended learning established significant roles and it usefulness cannot be over emphasized in instruction.
2. Lecturers indicated in their opinions that blended learning for instruction is user friendly and it is stress free in its utilization.
3. No significant difference existed between the perception of male and female lecturers in the usefulness of blended learning for instruction.
4. Significant difference existed between male and female lecturers' perception on the ease of use of blended learning for instruction

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Discussion

The perception of male and female lecturers on the usefulness of blended learning for instruction was examined in research question one. Thus, the results of the mean value revealed that male and female lecturers agreed that blended learning has significant roles on the meaningful and productive teaching process. Therefore, finding in this study is in line with the submission of Ferriman (2015), who asserted that blended learning strategy has noteworthy instructional opportunities, which should be encouraged by the school. Moreover, research question two studied the ease of use of blended learning for instruction among male and female lecturers. It was affirmed through the mean rating, that blended learning for Instruction is user friendly as shown in the response of the male lecturers.

From the corresponding hypothesis, to the research question, hypothesis 1 revealed that significant difference existed between male and female lecturers on their perception towards the usefulness of blended learning for instruction. This is supported with the submission of Shantakumari and Sajith (2014), who remarked that no difference was recorded in the opinion of students on blended learning on the bases of gender. Also, research hypothesis two, established that significant difference existed between male and female lecturers' on the ease of use of blended learning for instruction. This finding corroborates with the submission of Mayer (2003), who submitted that males are inquisitive, fully involved in questions, discussions, and remain active participants in the utilization of blended learning.

Conclusion

In order to be technologically engaging, lecturers in Nigerian institutions have to buy into ICT use, due to its contributions to the development of education. Therefore, the teaching-learning process should embrace various innovative technologies such as blended learning strategy. The relevance of blended learning as an instructional delivery method cannot be overemphasized. It was established from this study that blended leaning is very important in order to achieve meaningful, productive and an interactive individualized learning.

Recommendations

Based on the findings, the following recommendations were made in this study:
Blended learning strategy should be fully integrated, since it has tremendous roles on the teaching-learning process.
Both male and female lecturers should be encouraged to study the nitty-gritty of blended learning and encourage students on its utilization as both are equally agreed with its usefulness.
Lecturers should be adequately updated in the utilization of computer, so that blended learning as a learning strategy will be easy to use.
In-service training and workshop on the blended learning should be organized constantly as a refresher programme for lecturers.

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STUDENTS PERCEPTION OF THE USE OF EDMODO PLATFROM FOR LEARNING IN UNIVERSITY OF LAGOS

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Abstract

The rapid development of technology in online learning has also taken its cause in tertiary institutions in Nigeria. Its development has led many tertiary institutions to subscribe to online community like the Google App where learning is present not only in the four walls of the classroom. This paper, therefore, reports on students' perceptions using a Web 2.0 tool, namely Edmodo. In particular, the study aims at identifying their perceptions of using the platform in learning a faculty wide "Introduction to Educational Technology". The study involved 50 pre-service teachers from the Faculty of Education, University of Lagos randomly selected from the students who had been taught using the Edmodo platform. A research designed questionnaire adapted from Bolaji 2015 and observation was used for the study. The study is a descriptive study of the cross sectional survey. Mixed research was employed with a convenience sample for the stud. Percentage and mean used to analyse the research questions. The study revealed that students perceived the Edmodo platform to be good for learning, through a good interactive session. More so, the collaboration that exists through the use of the platform brings organization and novelty to students learning. Based on the findings of the study, it was concluded that the Edmodo platform was useful for learning and it was perceived to have a significant influence on their learning. It was recommended among others that lecturers should be well equipped with the basic knowledge of using this Edmodo platform so that the learners can benefit.

Keywords: Edmodo, Perception, Learning

Introduction

Information and Communication Technology (ICT) brought about changes and impact on the educational system in the twenty first century. Effective use of ICT to support teaching and learning in higher institutions like the University of Lagos who has the potential to transform the learning environment in the education system of a developing country like Nigeria from a face to face blended instruction to an online blended learning instruction through its centres like the Distance Learning Institute (DLI) and the Centre for Information Technology and System (CITS). To reposition teaching and learning for human capacity building in Nigeria, attention must be given to the use of online learning platforms in teaching and learning.

The demand and use of online tools in University of Lagos in Nigeria is growing very fast as online tools such as Google App have called the attention of policy makers and educators in the University (Yunus, Salehi & Chenzi, 2012). Titus and Mselle (2015) informed that Online tools may be used as platforms for e-learning in tertiary institutions and seem to draw students' current needs and interests related to their learning but most lecturers are of low expertise in the use of ICT for instruction (Chukwunonso & Oguike, 2013). There have been evidence of deploying technology to support blended learning in University of Lagos, but the exploration of opportunities provided by technology is not being given much attention as most lecturers don't use. The study by Loisulie and Mselle (2015), confirmed that there has been much resistance in the use of ICT by lecturers in higher institutions. Ndibalema (2016) related this situation to inadequate engagement of students in learning through technology. As a result, they graduate with minimal ICT pedagogical skills required of them to sustain its usage in their choosen profession (Ndibalema, 2015). On this basis, it was thought logical expose to pre-service teachers of the University of Lagos to Edmodo learning platform that supports students centered learning in a blended mode through a faculty wide course (Introduction to Educational Technology) that also teaches the use of ICT in instruction.

Research Question

1. How do students perceive the use of Edmodo for learning Introduction to Educational Technology in University of Lagos
2. Do students participate on the use of the Edmodo platform for learning.

Edmodo Learning Platform

Edmodo is a free and secure educational tool that you can use in the classroom to enhance the student experience while making your own job a lot easier. With features that allow you to keep a calendar, post assignments, start class discussions, and even accept assignments and post grades, this program is like a virtual classroom that can keep your students engaged both in and outside of the school setting while helping you to keep everything organized and in one place (Emerging Technology, 2013, Ndibalema, 2016). Edmodo can be used via computer or with mobile devices like smartphones and tablets, making it fairly versatile.

Edmodo positions itself as a "private communication platform built for teachers and students and parents". Its education-specific orientation, and group-focused approach position as it has a uniquely suited application for educational use. The site has around 5 millions of users as of early 2012. It integrates features from both LMSs like Moodle and SNSs like Facebook and therefore making it enjoyable and interactive. It also integrates applications and resources such as puzzles, games, snap shot and library to be shared among learners. It is flexible and interoperable in such a way that resources stored in other online resources such as Google drive can be integrated and shared with the learners.

Edmodo accepts different kinds of files including videos, simulations, documents and images. Students can also share content, submit assignments and quizzes, receive their teachers' feedback, notes and alerts as well as voting on polls (Jarc, 2010). It provides an opportunity for the e-library where lecturers may upload a number of authentic e-books, journal articles and various educational reports & other open educational resources (OERs) relevant for learning.

The Choice of Using Edmodo Learning Platform for Introduction to Educational Technology in University of Lagos

Edmodo was introduced to pre-service teachers at the University of Lagos based on a number of motives. Edmodo was considered as a learning platform that could enhance the easy delivery of the same instruction to groups since Introduction to Educational Technology students are in four major groups of (Science and Technology Education, Art and Social Sciences Education, Human Kinetics Education and Life Long and Continue Education, and Educational Management and Educational Foundation). Although there are books in the university main Library and the faculty library, but there is the need to train the teachers on what is expected of them in the classroom. Based on these, it was possible to introduce Edmodo as a tool to enhance the learning process among pre-service teachers in University of Lagos. Secondly, Edmodo was considered to be an important learning platform to enhance easy communication between the course lecturer and students as the parents were not involved on the platform. In this light, Edmodo was adapted as a learning platform that would solve the problem of poor dissemination of information and also train teachers on the use of ICT tools. The information and training given on the platform were course contents, course outlines, notes, students-lecturers interaction, course assignments and feedback on assignments.

Methodology

This research employed a mixed mode method by combining qualitative and quantitative data collection procedures. Convenience sampling technique was used to select the respondents. This study implemented a blended learning classroom by using Edmodo to facilitate learning environment of the introduction to educational technology taken by the 300level students of the University of Lagos. A total of 50 pre-service teachers were given the questionnaire and 10 responded to the interview voluntarily. In this case, three kinds of data collection instruments were used in this study. The major instruments used were a questionnaire and observation. The research questions were answered using mean while the observation was indicated using the snapshot of students participation on the platform.

Results

How do students perceive the use of Edmodo for learning Introduction to Educational Technology in University of Lagos?

Table 1:

Students Access to Edmodo Learning Platform for Introduction to Educational Technology

S/N	Access	Yes (%)	No (%)
1	I used mobile phone for this class	83.7	16.3
2	My mobile phone possesses facilities for internet connectivity	85.4	14.6
3	My mobile phone is able to use multimedia applications	81.6	14.6
4	I used a laptop computer for this class	14.6	85.4
5	My laptop computer possesses facilities for internet connectivity	20.4	79.6
6	My laptop computer is able to use multimedia applications	18.8	81.3
7	The signal strength and internet connectivity of my network is stable	36.7	63.3
8	I do subscribe to a monthly data bundle	54.2	45.8
9	I access the internet with my mobile phone anytime the need arises	81.6	18.4

Table 1 revealed that majority of respondents made use of mobile phone for the Edmodo learning platform, as the mobile phones possess facilities that could connect to the internet easily. Furthermore, the mobile phones are also able to access multimedia applications which are one of the main attribute of the edmodo learning platform. More so, few of the students used laptops for the class.

Table 2:

Students' Response on the Use of Edmodo for Learning Introduction to Educational Technology

	Teaching and Learning	Mean	SD
1	I learnt FED 301 through edmodo understandably	3.02	1.25
2	Students in my group work in collaboration to complete tasks	3.06	1.09
3	Collaboration with my peers through edmodo contribute to instructional activities	2.59	1.19
4	I collaborate with my peers through edmodo to coordinate instructional activities	2.65	1.23
5	Using technology for learning enhanced the quality of instructional contents	3.65	1.49
6	Do the multimedia applications accurately explain the concept taught?	3.13	1.23
7	Non-interference of instructor makes mobile learning more interesting	2.38	1.26
	Average Mean	**2.92**	

Table 2 shows the students response on the use of edmodo for learning. The result indicated that students learnt FED 301 through edmodo understandably with a mean score of 3.02, collaboration with a mean score of 3.06 and 2.59 for task completion and contribution to instructional activities respectively. Non-interference of instructor makes mobile learning more interesting has the lowest mean score of 2.38, which is below the bench mark of 2.50. The average mean score of 2.92 shows that students that used the edmodo learning platform learnt easily through the platform

Table 3:

Students' Response on Interactivity and User-Friendliness of Edmodo for Learning Introduction to Educational Technology

	Interactivity and User-Friendliness	Mean	SD
1	I enjoy interacting with my fellow collaborators during learning exercise using edmodo	2.56	1.18
2	Sharing and discussing assignments before final submission promotes healthy collaboration	3.53	1.42
3	Absence of instructor's input during discussion of assignments is a good approach	2.25	1.06
4	The medium of sending instructions is adequate	2.93	1.20
5	The level of interaction between collaborators and the instructor is friendly	2.78	1.10
6	Student-student interaction is enhanced through the creation of collaborative group	3.15	1.16
7	Students user-interface is adequate and simple	2.70	1.17
8	Learning through edmodo also improves interactivity among collaborators	3.21	1.38
	Average Mean	2.89	

Table 3 shows that Sharing and discussing assignments before final submission promotes healthy collaboration has a mean of 3.53, Student-student interaction is enhanced through the creation of collaborative group with a mean of 3.15 and Learning through edmodo also improves interactivity among collaborators with a mean of 3.21. The average mean score of 2.89 shows that the interaction and collaboration mode in the use of edmodo for learning is evident in the responses of the students.

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Students Perception of the Use of Edmodo Platfrom for Learning in University of Lagos

Do students participate on the use of the Edmodo platform for learning?

A total of 1,050 students registered on the platform for the course and a minimum of 750 pre-service teachers submits their assignments on weekly bases which starts 9.00 am on Sunday morning and closes 11.59pm of Saturday night. Students' lecturer interaction increased as a minimum of 500 students sign in on a daily bases to ask questions related to the class or the topic for the week using the lecturers time as stated on the platform. Below are the snapshots of the situations on the platform.
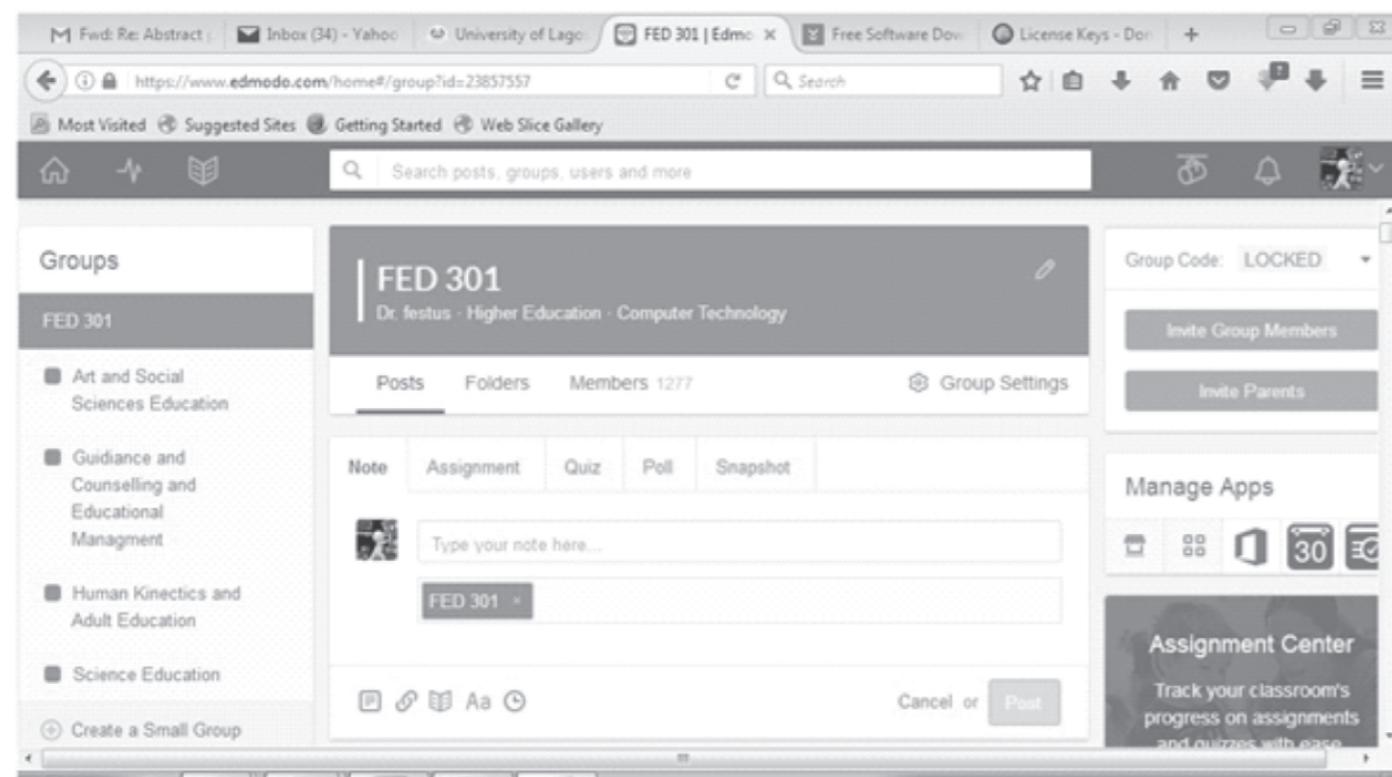
Figure 1: Screenshot on the sample of students' group on Edmodo for FED 301
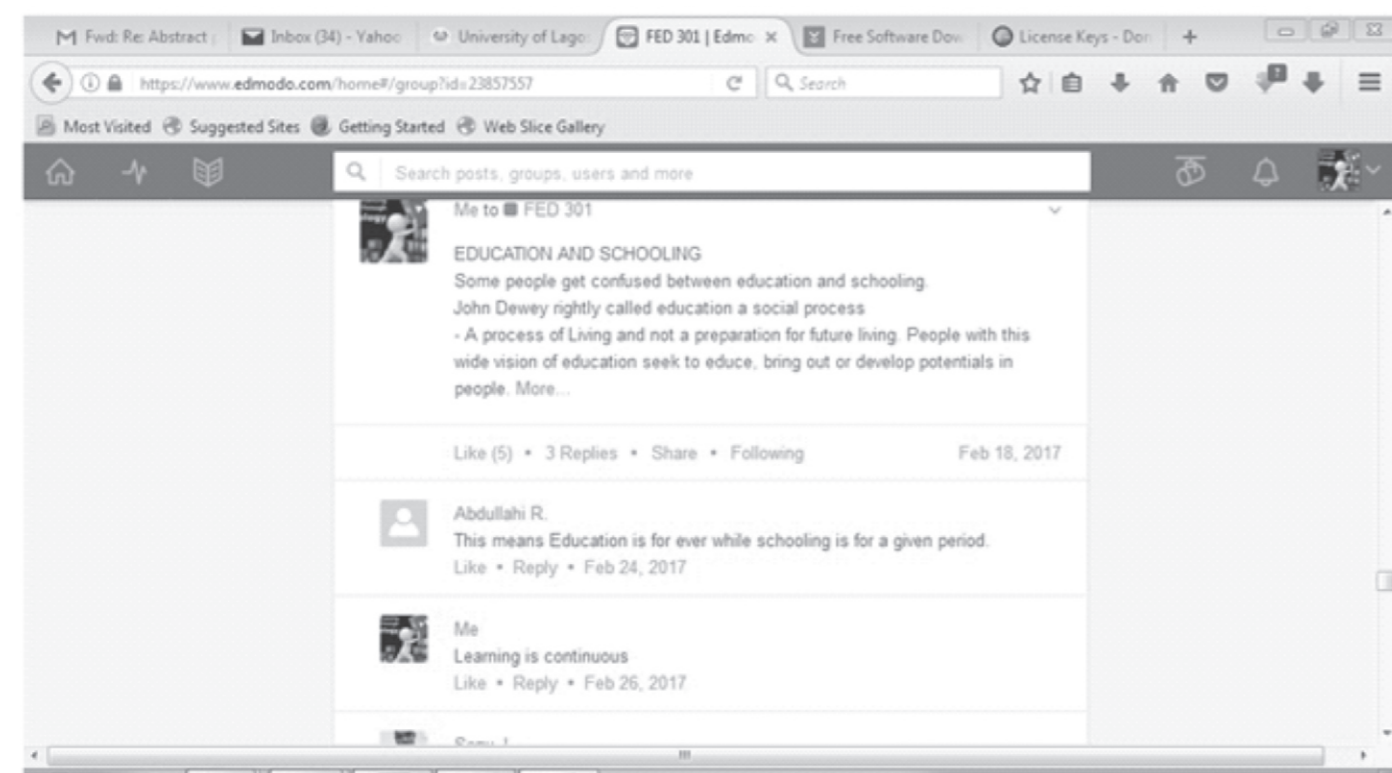
Figure 2: Screenshot on the sample of students'-Lecturer Interaction on Edmodo
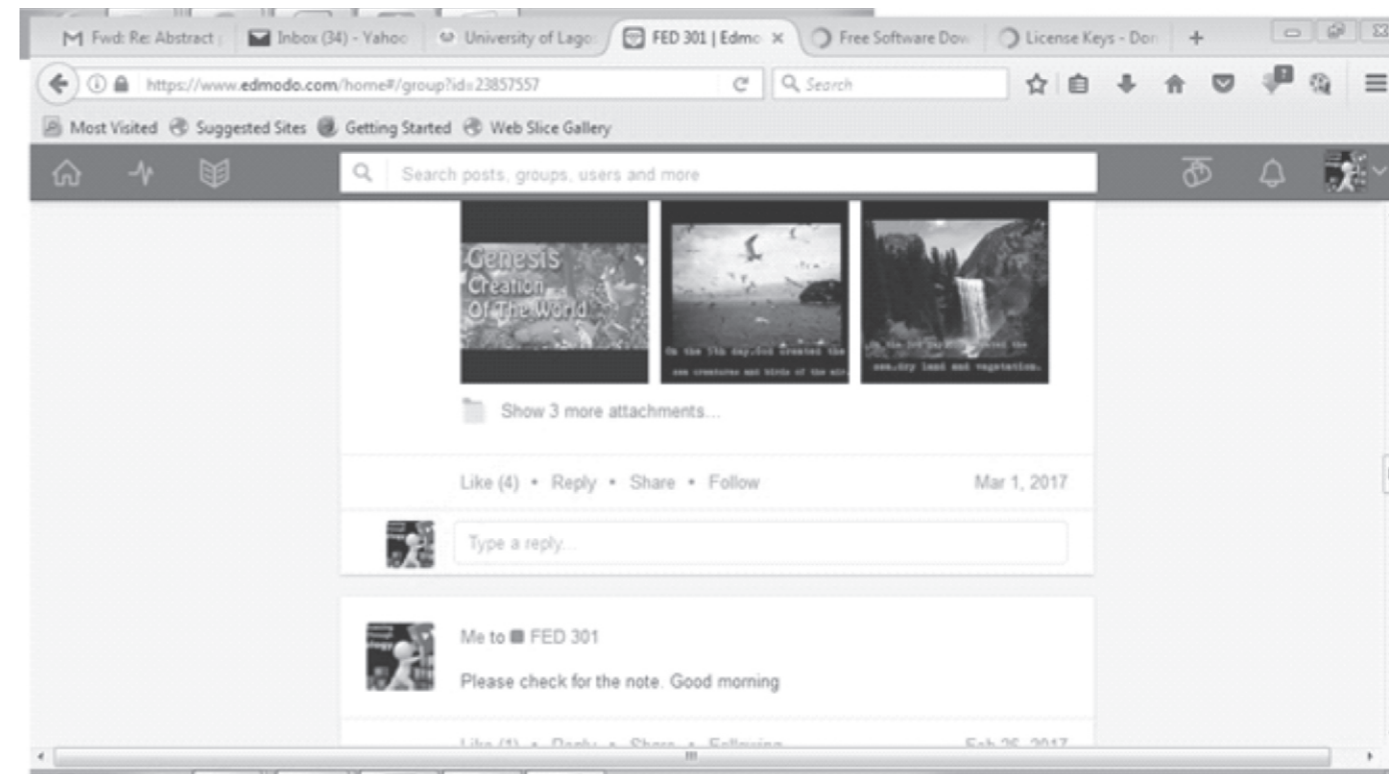
Figure 3: Screenshot on the sample of Upload of video by C.R.S. students' for Virtual Presentation.

Discussions

The result of this study are in consonant with the report of studies like Khwaileh and AlJarrah (2010), who reported that students perceived edmodo to be used for learning and also enhances effective communication between lecturer-students and students- students. The results conflicts with the report of Serin (2012) who reported that that prospective teachers' mobile learning perception levels were low as these study indicates that most of the pre-service teachers made use of their mobile phones. More so, the findings of this study also agrees with the findings by Looi and Yusop (2011), who reported that Edmodo provides a sense of community engagement in their learning with an added security advantage. Wallace (2014) also reported that with Edmodo, a teacher can create and share multimedia resources to support students' learning and provide learning tasks to scaffold students' learning.

Conclusion and Recommendations

This study revealed how students have learnt a facuty wide course with a population of over 1100 through a learning community like Edmodo. The platform was used to support students' learning in Introduction to Educational Technology in Faculty of Education, University of Lagos. The students perceived the Edmodo learning platform to be useful tool to enhance their learning. More so, the study revealed that most students made use of the App form of the edmodo through their phones.

Based on the conclusion, it was recommended that that lecturer in Nigerian Universities should be well equipped with the basic knowledge of using this Edmodo platform so that the learners can benefit effectively. Students should be trained on the use of other learning platforms that are closely related to Edmodo.

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COLLEGE LECTURERS' AWARENESS AND PERCEPTIONS OF USING OF BLENDED LEARNING

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Abstract

Blended learning, an innovative learning environment has been found useful in terms of opportunity to improve teaching and learning among other benefits. It is in the view of this, we carried out this study to find out the level of understanding, awareness and perception about the use of blended among the lecturers in a college of education in Osun State, Nigeria. In this study, we explored the level of understanding of blended learning, awareness of blended learning for teaching and, the perception about the use of blended learning among the lecturers. Convenience random sampling technique was used to compose a sample of 62 lecturers in the college. Frequency count, percentage, mean and standard deviation were calculated for the analysis of data. The findings revealed that majority of the lecturers (72.59%) indicated a moderate understanding of blended learning for teaching, and as much as 87% of lecturers are aware of blended learning for teaching. Also, the finding revealed that lecturers had positive perception about the use of blended learning.The study recommends that seminar and workshop should be organised for the lecturers to further update their knowledge on the benefits of blended learning for teaching.

Keywords: Awareness, Perception and Blended Learning.

Introduction

The introduction of Information and Communication Technology to teaching and learning has led to improving the innovative learning environment and the process of knowledge acquisition and dissemination at all levels of education. In some countries of the world, blended learning has been adopted, however, blended learning has not been fully instituted in most of the public tertiary institutions in Nigeria, most especially teacher education institutions. The low integration of blended learning at the teacher education level might have been unconnected with the lack or low of awareness and perception about the use of blended learning. Therefore, before teacher educators can embark on the adoption of this innovative learning environment, there is a need to ascertain and address their level of awareness and perception about the use of blended learning appropriately.

Blended learning is an educational programme (formal or informal) that combines online digital media with traditional classroom methods . Unlike the traditional classroom setting, blended learning is characterised by students control over time, place, path or pace. It also involves students receiving lesson or instruction within the four wall of the classroom with a teacher present face-to-face combined with computer-mediated activities. Blended learning has no exact definition due to to the context where it is performed. In view of different meanings given to the blended learning, we observed different approaches to blended learning. There are six distinct models of blended learning these include; Face-to-face driver, Rotation, Flex, Labs, Self-blend model, and Online driver (Freisen, 2012; DreamBox Learn, 2013; Connections Learning; Educational Technology and Mobile Learning, 2014; Idaho Digital Learning, 2016)

Blended learning has been a combination of online and traditional methods is more beneficial than the use of either online or traditional method. The reason for this is that in blended learning, the overall benefits of blended learning are more than the best of either constituent. For instance, the traditional methods facilitate physical human interaction between the teachers and their students but learning is restricted to the four-wall of a classroom. In the online method, learning can take place anywhere and anytime, at the same time, physical human interaction is lacking between the teacher and his students. With the two methods (online and traditional) combined together, blended learning affords the opportunity to teach/learn without being restricted to the four-wall of a classroom or keep students in the classroom for a long time. At the same time, blended learning gives an opportunity for physical interaction between the teachers and learners as the situation demands. In another word, blended learning limits the problems of geography and time and lack of interaction associated with the use of online method only.

Aside these benefits, the results of the empirical studies conducted revealed blended learning contributed positively towards entrepreneurial education than the traditional approach, reducing the dropout rate and at the same time improving examination scores . Since online learning has been considered as an important alternative approach to overcome various limitations of both online and traditional methods, the needs to investigate its awareness and perception of using it is necessary.

Purpose of the Study

The main purpose of this study was to investigate college lecturers' awareness and perception of using blended learning for teaching and learning. Specifically, the study:

1. investigated lecturers' level of understanding of blended learning;
2. investigated whether or not lecturers are aware of blended learning for teaching;
3. found the lecturers' perception of using blended learning;

Research Questions

Based on the purposes of the study, the following research questions were raised in the study.

1. What is the extent of lecturers understanding of blended learning?
2. Are the lecturers aware of blended learning for teaching?
3. What is the lecturers' perception of using blended learning?

Literature Review

A lot of research has been conducted to identify factors that determine technology adoption. Factors such as readiness (in terms of preparedness), awareness, perception, technology readiness (in terms of general belief about technology), self-efficacy, computer anxiety, performance expectancy, effort expectancy and so on have been found to influenced technology users' adoption of various technologies such as web 2.0, ICT, social media, self-service technology, Internet, blended learning, e-learning and so on. These determinants vary depending on the technology in context and the scope of the study.

In the context of blended learning, factors used in the study of adoption of blended learning include: performance expectancy, effort expectancy, social influence (Gawande, 2016); perceived usefulness of the system, learning goals, and educational technology preference (Haron, Abbas, & Rahman, 2015); awareness, preparedness and perception (Opoku & Kuranchie 2015; Alharthi, 2016).

Results of the previous studies conducted on blended learning have revealed varying trends on the factors that determine the adoption of the blended learning. For instance, (Haron, Abbas, & Rahman, 2012) in their study discovered that perceived usefulness of the system, learning goals and educational technology preference influenced the adoption of blended learning while no significant relationship exists between perceived ease of use and adoption of blended learning. Also, the perception of blended learning has no significant on the adoption of blended learning. Further analysis of the result revealed low adoption rate (13%) of the blended learning.

In another study conducted by Ibrahim and Shalizad (2015), it was revealed that ease of use, usefulness and intention to use influenced the adoption of e-learning in the blended learning platform, while perceived enjoyment was found not to influence adoption of blended learning. This study supported the findings of Haron, Abbas and Rahman (2012), where it was discovered that usefulness influenced adoption of blended learning. In terms of the awareness and perception of others factors, Opoku and Kuranchie (2015) and Alhathi (2016) studies revealed that awareness and perception have significant roles in the adoption of e-learning. We, therefore, included the sources of awareness of blended learning in this study to explore its influence on the perception about the use of blended learning among lectures.

Awareness is a relative term, there are different ways it can be defined and conceptualised according to the field of study and scholars. In general, awareness is having knowledge about the environment. In this context, awareness is defined as having knowledge about the existence and usefulness of blended learning. Awareness is one of the determinants of technology adoption. Recent studies conducted by Opoku and Kuranchie (2015), Alhathi (2016) and revealed that awareness plays a critical role in the adoption and usage of ICT. Slow adoption of technology can be due to lack of awareness about the existence and usefulness of that technology. Since blended learning is a new technology in Nigeria education system and more especially in teacher education context, we included awareness in this study in order to determine lecturers level awareness and the sources of the awareness on blended learning.

Apart from the awareness, perception is one of the factors that influence technology adoption. Perception is an important construct in technology adoption. Perception according to the online dictionary is a way of regarding, understanding or interpreting something. The literature on perception has revealed factors like gender, learning style influencing the perception of blended learning . At the same time, the perception has been found to have varying marked relationships with the adoption of blended learning. For instance, Haron et al. (2012) in their study found no significant correlation between perception and adoption of blended learning. While Opoku and Kuranchie (2015) and Alhathi (2016) found in their studies that perception has a significant role in the adoption of blended learning. Therefore, perception about the use of blended learning was included in this study.

Methodology

Research Instrument

The research instrument for this study is Lecturers' Awareness and Perception of Using Blended Learning Questionnaire (LAPUBLQ) designed by the researchers. LAPUBLQ comprised of 19 items, items 1-3 deal with demographic information covering gender, the understanding of blended learning and the sources of awareness of the blended learning.

While items 4-19 (16 questions) elicited responses on the perception about the use of the blended learning. The 16 questions include eleven positive questions and five negative questions. All the 16 questions were measured using 4-point Likert scales (from strongly agree to strongly disagree).

Validation and Reliability

Initially, the questionnaire was given to expert in educational technology and test and measurement through an online method using SurveyMonkey for content and face validity. A pilot test was conducted on 10 lecturers through online method to determine the reliability of the questions. The result of the reliability using SPSS v22 revealed the Cronbach's alpha to be .746 which shows that the questions were reliable and were properly tailored to measure the purposes of the study.

Sample and Data Collection

This research is a descriptive research of the survey type. The survey involved the use of a structured questionnaire to collect data from the randomly selected respondents across the sampled institution while convenience random sampling technique was used to select the respondents. A total of 80 copies of LAPUBLQ was distributed to the lecturers across the five schools in the college and only 62 (77.5%) copies were returned which shows a good return rate. According to , a return rate equal or above 60% is considered good.

Data Analysis and Discussion

The data collected were analysed using descriptive statistics of frequency counts, percentage, mean score and standard deviation. To determine whether lecturers' mean scores on the statements were significant, the decision point was put at X = 2.84, this implies that a mean rating equal or more than 2.84 is agree.

Descriptive Statistics of Demographics

The lecturers' demographics are presented in Table 1. Results from Table 1 show the male lecturers in this study consist of 40 (64.52%) of the sample while female lecturers involved were 22 (35.48%).

Table 1:
Lecturer Demographics

Demographic Variables	Categories	Frequency	%
Gender	Male	40	62.52
	Female	22	35.48
Understanding of Blended Learning	Low	5	8.06
	Moderate	45	72.59
	High	12	19.35
Sources of Awareness of Blended Learning	Lecture	5	8.1
	Internet/Online	30	48.4
	Seminar/Conference/Workshop	6	9.7
	Print/Electronic Media	10	16.1
	Colleagues	5	8.1
	Others	6	9.7

Research Question 1: What is the extent of lecturers' understanding of blended learning?

A look at the lecturers' responses on the understanding of blended learning revealed 5(8.06%) indicated a low level, 45 (72.59%) indicated moderate level and 12 (19.35%) indicated a high level of understanding. This shows that the lecturers have a moderate understanding of blended learning, so this answered the research question 1.

Research Question 2: Are the lecturers aware of blended learning for teaching?

A look at item 3 on Table 2 revealed that a total of 54 (87%) lecturers agree that they are aware of blended learning for teaching. Further analysis of the lecturers' responses revealed that the mean score for the item (M = 3.10, SD = .783) is significant. This finding indicates that lecturers are aware of the use of blended learning for teaching. This answered research question 2.

Research Question 3: What is the lecturers' perception of using blended learning?

Table 2:
Lecturers' responses on the perception towards using blended learning

Constructs	Measurement Instruments	SA	A	D	SD	M	STD. D
PBL 1	Blended learning offers the opportunity to improve teaching.	23	35	3	1	3.26	.723
PBL 2	Blended learning improves the quality of teaching.	24	34	1	3	3.26	.642
PBL 3	Blended learning makes teaching easier.	18	36	4	4	3.10	.783
PBL 4	Blended learning reduces dropout rates.	16	18	11	17	2.63	1.059
PBL 5	Blended learning improves learning outcomes/examination scores.	20	30	5	6	3.08	.874
PBL 6	Blended Learning provides learning anywhere and anytime	20	30	8	4	3.00	.958
PBL 7	Blended learning provides access to a variety of tools for communication.	19	28	8	7	2.94	.973
PBL 8	Blended learning makes posting and sharing of course materials easy.	21	23	10	8	2.89	1.057
PBL 9	Blended learning enhances monitoring and grading of students.	7	39	10	6	2.69	.879
PBL 10	I am interested in using blended learning for teaching	17	29	7	9	2.90	.936
PBL 11	Blended learning will make teachers lose control over the teaching and learning process.	26	25	2	9	3.21	.813
PBL 12	Providing feedback in a blended learning environment is more time-consuming.	2	21	20	19	2.92	.893
PBL 13	Blended learning can be more time consuming than the traditional method.	12	20	19	11	2.60	1.123
PBL 14	Lack of Internet connectivity will affect blended learning platform.	28	16	8	10	1.97	1.071

In measuring the lecturers' perception about the use of blended learning, they were asked to say whether or not they agree with different statements. In their responses, close to 94% agree that blended learning offers the opportunity to improve teaching; as much as 93% agree blended learning improves the quality of teaching. A look at the Table 2 revealed that 54% agree blended learning reduces dropout rates; 80% agree blended learning improves learning outcomes/examination score and provides learning anywhere and anytime. On blended learning provides access to a variety of tools for communication lecturers responses indicated 75% positive response, at the same time, 70% of the lecturers agree that blended learning makes posting and sharing of course materials easy. As much as 74% of lecturers agree on items 9 and 10 while 82% agree blended learning makes teaching easier.

In order to examine lecturers negative perception of blended learning, 37% agree feedback mechanism in blended learning is more time consuming; 51% agree blended learning can be more time consuming than the traditional method; 70% agree that lack of Internet connectivity will affect blended learning platform; 87% agree blended learning requires IT training; and as low as 19% agree blended learning will make them lose control over the teaching and learning.

A look at items 1, 2, 3, 5, 6, 7, 8, 10 and 11 on positive perception on the use of blended learning revealed that lecturers' responses on these items were significant. In other words, nine out 11 positive perception items have their mean scores greater than the weighted mean. While response on blended learning reduces dropout rates was found to be insignificant, likewise lecturers response on blended learning enhances monitoring and grading of students were found to be insignificant as their mean score was below the weighted mean.

The responses of the lecturers on negative perception items (12 and 16) have mean scores greater than the weighted mean, while lecturer responses on items 13, 14 and 15 mean scores are less than the weighted mean. This shows lecturers responses on items 13, 14 and 15 are insignificant. The summary of this discussion indicates that the lecturers' perception about the use of blended learning is high. A critical look at table 2 revealed that lecturers voted thirteen out sixteen statements significant. This does answer research question 4.

Conclusion

In this study, we have sought to answer a number of research questions related to awareness and perception of using blended learning, We have asked in particular what are the levels of understanding of blended learning, lecturers awareness of blended learning for teaching, and lecturers' perception of using blended learning. In summary, we found that majority of the lecturers show moderate understanding of blended learning. Moreover, the study shows that lecturers are aware of blended learning and their perception about using blended learning is positive. In view of this, we presented some of the implications for this study and the direction for future research that stem from this study.

Implications

Accordingly, the first major practical contribution of the present study is that it provides much needed important information on blended learning. The results of the study revealed that lecturers are aware of blended learning for teaching and have positive perception about the use blended learning for teaching. This information is necessary since blended learning is very new in Nigeria.

A second important implication of our study derived from our findings points to the fact that lecturers lack knowledge about the use of blended learning to reduce the dropout rate and to enhance monitoring and grading of students. This information is important in the sense that despite the lectures positive perception of using blended learning, they lack information on the use of blended learning to reduce the dropout rate and enhance monitoring and grading of students. This suggests the need to equip lecturers with the knowledge about the relevance blended learning for teaching. The importance of blended learning goes beyond improving teaching-learning process and students' score.

Recommendations

Our findings, therefore suggest that workshop and seminar should be organised for the lecturers of teacher education institutions and other institutions of higher learning. It is hoped that when lecturers of teacher education institutions embrace and integrate blended learning, their products will be able to use blended learning after the training. Also, we suggest technology and infrastructures needed for the integration and adoption of blended learning should be provided in the teacher education institutions. In addition, we suggest that lecturers should select and use a model of blended learning applicable in their institutions and the subject/course they teach.

Limitations and Suggestion for Future Research

Although our study falls short of using a college of education and small sample size as the results of this study may not be generalisable. This study, therefore, raises a number of opportunities for future research both within and outside the teacher education context. This study could thus be extended to other levels of teacher education institutions. Equally, this study could be extended to explore factors that determine adoption of blended learning in the context of teacher education institutions. Another area this study could also be extended is by exploring comparative study on the perception of using blended learning among lecturers at different levels of higher education institutions. Last, we suggest this study should be extended by exploring the influence of demographic variables like gender, age, qualification, year of experience and so on.

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EVALUATING THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES ON THE PERFORMANCE OF LECTURERS AND STUDENTS IN SOME TERTIARY INSTITUTIONS IN GHANA

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Abstract

Information and Communication Technology has been part of Ghana's education system since 1995. Despite the huge economic investments in providing computer infrastructure, rigorous assessment of the impacts of its integration in lesson delivery and academic performance of students has not been carried out to be able to judge its effectiveness and challenges in its usage. This assessment is even more crucial in higher institutions of learning where students are instructed in Information and Communication Technology to utilize them for the world of work. A concurrent triangulation design of the mixed method research design was used to examine the impacts of the integration of Information and Communication Technology on lesson delivery and student performance. A descriptive study method with interviews, questionnaire and observations as instruments were used in generating data from a random and a stratified random sample of 496 respondents from four tertiary institutions in Ghana. The quantitative data were analyzed using the Statistical Package for Social Scientists software while the qualitative data was analyzed via thematic analysis. The findings from the study revealed that Information and Communication Technology has impacted favourably on the lesson delivery of lecturers and students' learning outcomes in the areas of research, easy dissemination of information and assessment procedures. The study contends that to enhance the integration of Information and Communication Technology in the lesson delivery and the academic performances of students, educational policies must be changed to factor in modern technological advancements.

Keywords: *Information and Communication Technology, Lesson Delivery, Student Performance*

Introduction

Preparing societies and governments for globalisation and information and communication revolution is one of the many challenges facing developing countries today (Adler, 1999). Policy-makers, business executives, non-governmental organisation (NGO) activists, academics and ordinary citizens are increasingly concerned with the need to make their societies competitive in the emerging information economy.

The appearance of this new global economy in many serious ways affects the modern society (Wang, 2009). Educational, financial, social and professional development sectors have been benefiting from information and communication technologies (ICTs) for years. ICT has become one of the fundamental building blocks in education. To this end, many countries now regard the mastering of the basic skills and concepts of ICT as an inevitable part of the core of education.

According to Leach (2005), ICT needs to be seen as an essential aspect of the teaching's cultural toolkit, affording new and transformative models of development that extend the nature and reach of teacher learning wherever it takes place. Although ICT is now at the centre of education reform efforts, not all countries are able to benefit from the developments and advances that technology can offer (Kozma & Anderson, 2002). Pryor and Ampiah (2003), in their consideration of Education for All (EFA), asserted that developing countries could dismiss the idea of ICT in schools as a blind alley. Farrell and Shafika (2007) therefore indicate that all but a handful of African countries already has an ICT policy in place or under development.

Thus, the new phase of ICT for education in Africa is occurring within national, and emerging regional, policy frameworks that are providing the basis for partnerships and donor participation. However, the experience of introducing different ICTs in the classroom and other educational settings in Ghana over the past several decades suggests that the full realization of the potential educational benefits of ICT is not automatic. Mumtaz (2000) specifies that constraining factors to the integration of ICT in education can be categorized in different ways. These include challenges associated with both students' and teachers' use of the technology, the technology itself and the factors associated with technology-enhanced projects.

Therefore, there is the need to assess the impacts of I.C.T. integration in the lesson delivery of lecturers and in the academic performance of students while suggesting proactive ways of mitigating the challenges associated with such integration. This happens to be the main thrust of the research pivoted on three main research questions:

1. What is the extent of the relationship between I.C.T. integration and the lesson delivery of lecturers?
2. What is the extent of the relationship between I.C.T. integration and the academic performances of students?
3. What challenges are encountered in the integration of ICT in education and what are the possible solutions to those identified challenges?

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Seeking for reliable answers to these important questions would assist the researchers in assessing thoroughly, the impacts of I.C.T. into the teaching and learning activities in higher institutions to evaluate whether the Ghana Education System is making giant headways in the adoption of modern technologies in delivering effective education to learners.

ICTs are beneficial to teachers as they play an important role in transforming education and training (Bransford, Brown & Cocking, 2000). ICTs enhance educational reforms by enabling teachers and learners to move away from traditional approaches to teaching and learning.

Adeya (2002) summarises that the integration of ICT in education creates equity in access to learning opportunities, redresses equalities, improves the quality of learning and teaching and delivers lifelong learning. It also helps teachers to create more open learning opportunities for students and pupils. ICT has a major impact on teaching and learning methods. Bransford et al. (2000) report that ICT plays various roles in learning and teaching processes. It enhances students' achievements and teacher-learning. Iding, Crosby and Speitel (2002) also point out that ICT plays a part in supporting face-to-face teaching and learning in the classroom. It therefore helps students to be knowledgeable, reduces the amount of direct instruction given to them, and gives teachers an opportunity to help those students with particular needs. Grabe and Grabe (2007) specify that ICT plays a role in student skills, motivation and knowledge. It can be used to present information to students and help them to complete learning tasks. It again accommodates differences in learning styles and removes barriers to learning by providing expanded opportunities and individualised learning experiences (Stephenson, 2001). Thus, ICT plays an important role in the transformation of education and training by enhancing educational approaches to teaching and learning.

Kozma (2005) argues that ICTs are used to improve the delivery of and access to education. This is done by improving education on the margin by increasing the efficiency by which instruction is distributed. Kozma further indicates that ICTs are the focus of learning whereby students become better prepared for the working environment that increasingly involves the use of ICTs. Just as technology influences and supports what is learned in schools, it also supports changes to the way students learn. Moves from content-centred curricula to competency-based curricula are associated with moves away from teacher-centred forms of delivery to student-centred forms.

ICT has the capacity to promote and encourage the transformation of education from a very teacher-directed enterprise to one which supports more student-centred models. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools, the influence of the technology on supporting how students learn will continue to increase (Jonassen& Reeves, 1996).

From the uptake of technology, other issues have emerged, including changes to the make-up of the teacher pool, changes to the profile of learners and changes in the costing and economics of course delivery. The United Nations Economic and Social Commission [UNESCO] (2004) reports that ICTs help in the achievement of the Millennium Development Goal two (MDG 2) by increasing the supply of teachers through ICT-based distance education and enabling greater access to education for all which will strengthen the knowledge equity on technology. UNESCO describes distance learning as any educational approach which aims to reach learners in the place where they are providing learning resources or permitting them to become qualified without the need for physical presence in the classroom.

Within the changed pool of teachers will come changed responsibilities and skill sets for future teaching involving high levels of ICT and the need for more facilitative than didactic teaching roles (Littlejohn, Suckling, Campbell & McNicol, 2002). ICT helps in the expansion of the pool of students. The pool of students is changing and will continue to change as more and more people who have a need for education and training are able to take advantage of the increased opportunities (Oliver, 2000).

The direct link between ICT use and students' performance has been the focus of extensive literature during the last two decades. Several studies have tried to explain the role of technology in education and the added value of these technologies in classrooms and on students' performance. However, the assessment of the effect of ICT on students' performance of various authors has been mixed. Brown and Liedholm (2002) surveyed students in a matched pair of online and face-to-face principles of an economics course taught by the same teacher. They reported that examination scores, after taking into account differences in student characteristics, were approximately six percent higher for the on-campus format than for the online format. They attribute the relatively better performance in the on-campus classes to the benefit of in-person teacher-student interactions, and attribute the relatively poor performance of the students in the online class to the lack of self-discipline necessary for successful independent learning in the online environment.

On the other hand, Banerjee, Cole, Duflo and Linden (2004) present the results of a randomised policy evaluation carried out in two Indian States to improve the quality of education in urban slums. The authors found out that a computer assisted programme, designed to reinforce mathematical skills, had a large and positive impact on mathematics scores. However, the programme did not produce positive spill-overs to other subjects.

Machin, McNally and Silva (2006) also evaluated whether changes in ICT investment had any causal impact on changes in educational outcomes in English schools over the period from 1999 to 2003. Using an Instrumental Variable (IV) approach to control for endogeneity of ICT use, the authors found evidence for a positive causal impact of ICT investment on educational performance in primary schools.

Notwithstanding the benefits associated with the integration of ICT in education, there are some challenges attached to the use of ICT. The first challenge associated with the use of ICT in schools is teacher qualifications and expertise. Crawford (2000) points out that most IT teachers employed in English secondary Schools lack qualifications and training in IT or computing, while very few have been specifically trained to teach IT.

Crawford (2000) explains that the recent availability of Internet access in schools has required IT teachers to learn about email and web browsers to re-focus their programming skills so that they can build websites using HTML and be aware of new web-related features in familiar software, such as word processors. This has challenged the capacity of many teachers. A related problem to the above-stated problem is the low confidence teachers have in teaching or using ICT facilities in teaching students. This is especially the case when they find out that their IT skills are out of date in comparison with those of their students. A research by Goldstein (1997) concluded that it is not surprising that "Teachers' command of IT subject was weak and appeared to weaken in comparison with previous year" (p. 11).

In terms of availability of ICT hardware and software, Crawford (2000) identified another problem. Crawford found that the hardware and software available in schools is not consistent between and often within schools. Using examples from South Africa, Crawford explained that different hardware platforms were available (49% IBM compatible; 7% Apple; 32% Acorn-DfEE, 1997) and each school has a variety of different software in use.

Methodology

The mixed method approach that combines both qualitative and quantitative approaches was used for driving the entire study (Creswell, 2009). A concurrent triangulation design of the mixed method approach was adopted for the study. In this approach, both the qualitative and quantitative data were collected concurrently in one phase though the analysis for each set of data is carried out separately (Trochim, 2008). Finally, the interpretations from both sets of data are integrated.
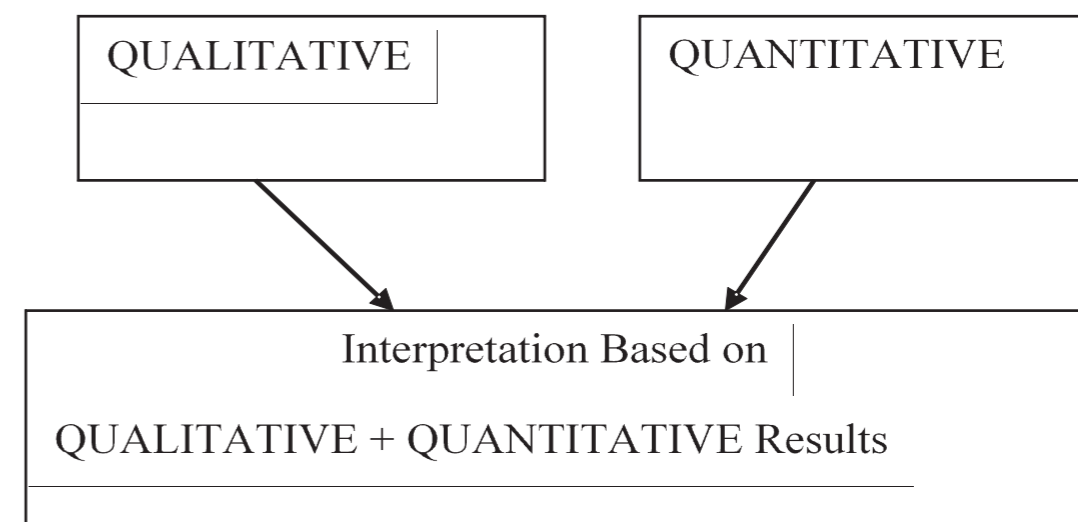
Figure. 1 Concurrent Triangulation Design (Source: Creswell, 2009)

The researchers adopted this design to cross-validate the findings of the study to give a deeper comprehension on the extent of the integration of I.C.T. in the lesson delivery of lecturers as well as the academic performances of students (Creswell, 2009). A one-sided approach would not have been very efficient in yielding the best paradigm of assessment.

A descriptive research design was adopted for the study. Burns (2000) has observed that the purpose of descriptive research is to observe, describe and document an aspect of phenomena as it naturally occurs. It is concerned with the conditions of relationship that exist, such as determining the nature of prevailing conditions, practices and attitude, opinions that are held, processes that are going on or trends that are developed. The choice of descriptive design for the study was due to the fact that the design finds answers to questions through the analysis of relationship between or among variables, herein being I.C.T. integration and lesson delivery of lecturers and students' performance.

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Moreover, the descriptive approach assisted in the assessment of the impacts of I.C.T. in teaching thus, via the use of computer technology as well as in research works and learning processes of tertiary students. Questionnaire was the main data collecting instrument used for collecting quantitative data which was analysed using the SPSS software to generate statistical tables and percentages to support and validate the findings of the study. The questionnaire as a data collection instrument was very important because it aided the researchers in obtaining the views of a large number of respondents in the tertiary institutions who because of difficult schedules could not offer the researchers a face to face interview.

On the other hand, interviews and direct observations were used for soliciting for the qualitative data which was analysed using thematic analysis. Both instruments assisted the researchers in interacting with the key respondents, thus, lecturers and administrators in the tertiary institutions to know at first hand, how I.C.T. influenced their duties. For instance, the researchers personally observed how the use of I.C.T. or otherwise, impacted the lesson preparation and lesson delivery of lecturers while soliciting for their views on the challenges they encounter with such integration and ways of remedying them. Again, while interacting with students in their hostels as well as in their lecture rooms, the researchers observed at first hand, how I.C.T. impacted on their studying and learning habits. During the interview sessions with the respondents, their responses were tape-recorded and transcribed thoroughly. Each data collection instrument was given an identification number to avoid any data loss and double entries. The data from the direct observations of classroom teaching methods assisted the researchers in assessing how I.C.T. was utilized for both teaching and learning activities in the selected tertiary institutions. The reliability of the data collecting instruments were established using the Cronbach Co-Efficient Alpha, a measure of internal consistency. A Cronbach Alpha Co-efficient of 0.80 implied that the instruments explained 80% of the issues of the study. With regard to the face validity of the instrument for the study, the items were submitted to course mates, supervisors and other lecturers with expert knowledge in validation of the research instrument and ICT.

The study was carried out in four tertiary institutions in Ghana, thus, Ho Polytechnic, Evangelical Presbyterian University College in Ho, Ghana Commercial Bank Training College at Nungua, and Standard Chartered Banking College. A total of 496 respondents were sampled for the study. This comprised 348 students (87 per institution), 100 lecturers (25 per institution) and 48 administrators (12 per institution). Stratified random sampling was used in selecting the sample for the study. The study categorised the study population into four – along the four institutions. Equal proportionate sampling was used to sample respondents from the various institutions. Thus, 125 respondents were sampled from each institution. This was to have fair representation from the institutions. The administrative staffswere sampled using the simple random sampling technique. Finally, thorough analysis of the rich data accrued from the data collecting instruments was carried out and a consistent, narrative essay of the findings was made.

Results and Discussions
Ways ICT Contribute to the Delivery of Education in Ghana
This section of the research sought to find out the ways ICT contributes to the delivery of education in Ghana. Table 1 shows the results of the contribution of ICT to education delivery.

Table 1:
Contribution of ICT to Education Delivery

Item	Yes		No	
	Frequency	%	Frequency	%
Access to the Internet	317	91.1	31	8.9
Use of the Internet	304	87.4	44	12.6
Benefits in terms of doing research	159	45.7	189	54.3
Internet in communications	317	91.1	31	8.9
Access to facilities in the Lab	144	41.4	204	58.6
Access to facilities after School	0	0	348	100
Use of computers for assessment	82	23.6	266	76.4

Source: Sample Survey, 2016

Items were employed to ascertain the contribution of ICT to education delivery. The analysis represented in Table 7 shows that 98% and 93% of the respondents made up of 317 and 304 out of the 348 students, respectively, have access to the Internet and do make use of it as well. In addition, 159 (45.7%) respondents indicated that ICT facilitates their research work. Furthermore, 317 (91.1%) respondents indicated that ICT facilitates easy communication and dissemination of information within and across departments and educational institutions. This is supported by the report of the Asian Pacific Bureau of 2004 which indicates that students can access a wealth of educational resources outside the school and collaborate with other educational institutions through the use of the Internet. Data was also collected on the number of times respondents benefitted from computer literacy programmes in their schools. The outcome of this is reflected in Table 2.

Table 2:
How often Students have benefitted from Computer Literacy in School

Item	Frequency	%
Once	193	55.5
Twice	95	27.3
Thrice and above	60	17.2
Total	348	100

Source: Sample Survey, 2016

The data gathered from the research and analysed in Table 2 showed that out of the 348 students, 193 (55.5%) of the students interviewed said that they have benefitted only once from a computer literacy programme in their school. Ninety-five (27.3%) said they have benefitted twice, and the remaining 60 (17.2%) indicated that they have benefitted more than twice. From Table 8, it can be said that significant gains can be made by students if they are able to have an improved access to the computer literacy programmes and the availability of the Internet. The main objective of this section is to find out ways in which ICT actually contributes to education delivery in Ghana. In 2004, Parliament passed into law Ghana's ICT for Accelerated Development (ICT4AD) policy which is currently at various stages of implementation. The results of the study indicate that there is an active relationship between education delivery and ICT.

The results further show that ICT should be seen as a vital tool that can enhance students' academic performance and educational delivery in Ghana. This finding is supported by Oliver (2000) when he indicated that ICT as a force has changed many aspects of the way we live. Furthermore, Jhurreev (2005) reports that when technology is used to assist the human brain, new intellectual capabilities are created, thereby helping to change most aspects of a person's life. This is confirmed by studies conducted by Dzidonu (2004, p. 14) and Pryor and Ampiah (2003, p. 4). They both mentioned in their separate works that there is an "increasing demand for educational services" such as ICT and that the "accelerating pace of technological change is a worldwide phenomenon" and educational delivery cannot be left out. Thus, we see from the analysis that ICT is perceived to be playing a very important role in the delivery of education in Ghana.

In addition, Kelleher (2000), in relation to the managerial aspects of education delivery, indicated that the use of ICT-related technology is particularly helpful because administrators can construct virtual scenarios around different policy options to determine needs and analyse potential consequences. Kozma and Anderson (2002) also agree that through an increase in motivation, by the use of multimedia and computer software, teacher training and subsequent delivery is greatly enhanced. This literature supports the analysis results that ICT is actively contributing to educational delivery in Ghana.

There is no Statistically Significant Difference in Student's Academic Performance Before and After the Use of ICT
This hypothesis was ascertained by running a paired sample t-test at five percent level of significance at 299 degrees of freedom. The result of the test is indicated in Table 3.

Table 3:
Result of the Paired Sample T-test

t-value	mean difference	Df	$p<0.05$
19.422	0.35	299	0.001

Source: Sample Survey, 2016

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The analysis in Table 3 shows that the value of the test statistics (t-value) is 19.422 and the p-value is 0.001. Since the p-value is less than the five percent level of significance, the null hypothesis is rejected at the five percent significance. The study, therefore, concludes that there is a significant difference in student's academic performance before and after the use of ICT. Further analysis was then carried to examine whether this significant change was positive or negative. There was a positive mean difference of 0.35, indicating a significant positive impact on the student's academic performance. From the above analysis, it can be observed that there is a very significant effect of ICT on student academic performance. This is buttressed by Leach (2005) who argues that if universities are to maximise the potential of e-Learning as a means of delivering higher education, they must be fully aware of the critical success factors. This is because of the significant effect of ICT on student academic performance. One other idea that typically supports the positive effect of ICT on education, as indicated in the study, is the fact that teachers who claim to follow the innovative educational practices such as use of inquiry, project-oriented work and hands on activities are more likely to use new technologies than those who stick to the traditional instructional approaches (Machin et al., 2006).

However, the total positive effect of ICT on education has not been realised because, according to Pelgrum (2001), there are still factors that impede the total integration of ICT in institutions of learning. These factors, according to him, include lack of knowledge and skills by teachers as well as insufficient number of computers and ICT infrastructure in general. In a related study, Ely (1993) distinguished three factors which include dissatisfaction with the status quo, availability of resources and the pool of knowledge and skills available.

There is no Statistically Significant Difference in Service Delivery of Lecturers in Tertiary Education Before and After the Use of ICT

This hypothesis was tested using a paired sample t-test at five percent significant level with 99 degrees of freedom. The analysis to that effect is presented in Table 4.

Table 4:
Result of the Paired Sample T-test

t-value	mean difference	Df	p<0.05
9.782	0.61	99	0.001

Source: Sample Survey, 2016

The result of the analysis tabulated in Table 4 shows that the value of the test statistics is 9.782, whilst the significant probability is 0.001. Since the P-value is less than the 0.05 level, the null hypothesis is rejected at the five percent level of significance. The result shows that there is a significant difference in service delivery of lecturers in tertiary education before and after the use of ICT. Thus, lecturers find it easier to do their work when ICT tools are available in their educational institutions than when they were not available. This observation is supported by the work of Kozma and Anderson (2002) which indicates that the Internet possesses the propensity not only to change the way society retains and accesses knowledge, but also to transform and restructure traditional models of higher education, particularly the delivery and interaction in and with course materials and associated resources.

There is a Significant Difference in the Dissemination of Information in Educational Institutions Before and After the Use of ICT

Table 5 shows the result of a paired sample t-test at five percent level of significance with 499 degrees of freedom

Table 5:
Result of the Paired Sample T-test

t-value	mean difference	Df	p<0.05
5.32	0.87	499	0.001

Source: Sample Survey, 2016

The value of the test statistics (t-value) is 5.32, whilst the significant probability is 0.001. Since the significant probability (p-value) is less than the five percent level of significance, it implies the null hypothesis is rejected at the five percent significance. Based on this result, it is concluded that there is a significant difference in the dissemination of information in educational institutions before and after the use of ICT. Further analysis was then carried out to examine whether the difference was positive or negative and the result in Table 11 shows a positive mean difference of 0.87. This, therefore, shows that Information and Communication Technology (ICT) enhances information dissemination in educational institutions. Indeed, it has been confirmed through the study that information dissemination is enhanced greatly through the use of ICT. Accordingly, Crawford (2000) argues that the vast expansion of the Internet and related technological advancements, in conjunction with limited budgets and social demands for improved access to higher education, has produced a substantial incentive for universities to introduce e-Learning courses. Crawford concurs that if universities do not embrace e-Learning technology that is readily available, they will be left behind in the pursuit of globalisation.

There is a Statistically Significant Difference in Accessing Information in Tertiary Education Before and After the Use of ICT
The result of the test is displayed in Table 6.

Table 6:
Result of the Paired Sample T-test

t-value	mean difference	Df	p<0.05
11.82	0.47	499	0.001

Source: Sample Survey, 2016

The fourth hypothesis was tested using a paired sample t-test as five percent significant level with 499 degrees of freedom. The result shows that the value of the test statistics is 11.82, whilst the significant probability is 0.001. Additionally, the null hypothesis is rejected at the five percent level of significance since the p-value is less than the 0.05 significance level. This, therefore, means that there is a significant difference in accessing information in tertiary education before and after the use of ICT. The positive mean difference of 0.47 also indicates that ICT has a positive relationship with access to information in tertiary educational institutions. It therefore means that getting academic information, remote learning resources and study materials where there are ICT tools is easier than in institutions where such facilities do not exist. To exert "attitudinal" changes in current "traditional" educational delivery practices by universities in order to fully utilise e-learning strategies for improved delivery of courses for its students, easy access to materials is pivotal. It is in line with this that Pelgrum and Law (2003) stated that ICT's have been identified as powerful tools for helping teachers with all the different aspects of their job, promoting the accessibility of information, enhancing instruction, simplifying administrative tasks, fostering professional growth and, in some cases, their own personal productivity. According to the authors, some teachers find that using various technologies allows them to teach in entirely different ways. In the information age, which has led to a complex social and institutional structure in modern society, one has to be a global citizen to operate successfully.

Conclusions
The impact of ICT in the delivery of education in tertiary institutions cannot be underestimated. However, due to a myriad of challenges in the sector, such as lack of adequate skilled labour, the desired effects of ICT on education are not being felt. In conclusion, a lot of benefits have been demonstrated by the institutions that participated through the acquisition of both technology and academic skills. Furthermore, there is room for collaboration, global awareness and working on projects with students in both their schools and with those from other countries, even though the situation has shown some remarkable improvement with the inception of the use of ICT in the educational sector. However, with the following recommendations, it is believed that progress can be significantly made in the sector:

There is the urgent need for Government to work with the appropriate agencies to address the challenges facing the integration of ICT into the delivery of education in tertiary institutions. Modern computers should be procured for the institutions to facilitate enhanced delivery of education. In addition, educational policies, programmes and structures should be looked at consistently and changes made whenever the need arises in the interest of improving educational delivery towards the betterment of the kind of labour that we turn out of our institutions.

Secondly, a policy should be put in place to encourage students to draw their own technology learning goals. This should make it possible for them to evaluate their progress and the quality of their projects so as to refine what it is they have to know. This can be done with the use of ICT tools online or through face-to-face training workshops, among others. This, when done will be in line with the new pedagogical models required in the adoption of constructivist and constructionist learning outcomes. Finally, there is the need for the provision of technical support to schools in line with the installation and maintenance of ICT infrastructure. This should not be underestimated. A lot of trained technicians must be employed to offer technical support to the tertiary institutions, administrators and other educational workers.

The researchers suggest a further study into the examination of the effect of lecturers' professional knowledge in ICT on teaching in tertiary education in order to efficiently spearhead its integration into the teaching and learning activities in higher institutions of learning in Ghana.

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LECTURERS' PERCEIVED EASE OF USE MOBILE DEVICES FOR TEACHING UNDERGRADUATES KWARA STATE, NIGERIA

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Abstract

This study examined the perceptions of lecturers on integrating mobile devices for teaching undergraduates. Moderating influence of gender on the ease of use of mobile devices for teaching. Data were collected from 356 university lecturers from four Universities in Kwara State which include Al-hikmah University, Kwara State University, Landmark University and University of Ilorin using a random sampling technique. Data were analysed using mean to answer research questions perceived ease of use of mobile devices for teaching undergraduates; perceived ease of use of mobile devices for teaching undergraduates based on gender; No significant difference was found between male and female lecturers in their perception on the usefulness of mobile devices for teaching. Findings showed that: lecturers perceived mobile devices easy to use for teaching with Grand Mean of (2.47) there was no significant difference between male and female lecturers' perceived usefulness of mobile devices for teaching with t value of (354) and significant value of 1.07, p > 0.05. The implication is that mobile devices were found easy to use for teaching by lecturers, irrespective of gender. Therefore, lecturers should be encouraged to attend trainings, conferences and capacity building workshops in order to acquire skills on the use of Mobile Devices and other ICT tools for teaching.

Keywords: Perceived ease of use, ICT, Mobile devices, Mobile Learning

Introduction

Perception of lecturers on the ease of use of mobile devices for teaching undergraduates in Kwara State, Nigeria Information and Communication Technology (ICT) is the use of scientific tools and techniques for developing, documenting and communicating information for solving problems or providing needed services in the various areas of human endeavor (Chukwuemeka, 2010). Mumtaz (2000) defined ICT in education as all the contemporary digital tools, such as computers, accessories and Internet that can be used in education it to fulfill its goals. He also opined that with the introduction of ICT, the teaching and learning process will change and new skills for the teacher and the learner would be developed. Moreso, recent advances in computer technology and diffusion of personal computers, productivity software, multimedia and network resources over the last decade heralded the development and implementation of new and innovative teaching strategies. Educators who advocate technology integration in the learning process believed that it will improve learning and better prepare students to participate in the 21st century workplace. The study concluded that the field of education has not been indifferent to the computer revolution. When connected to the internet, it will make users especially educators to be conversant with latest issues in the field of research especially in the mobility of information, thereby providing learners with more flexible access.

Mobile Learning (m-learning) is a form of learning using wireless devices that can be used wherever the learner is with unbroken transmission signals. These include mobile devices like smartphones, tablet computers, laptops and personal digital aids (PDAs). The definition of m-learning contains three key components which are mobility of technology, mobility of learners and mobility of learning processes. Mobility of technology refers to the mobile nature of installed hardware and software that enable constant wireless Internet connection. Mobility of learners is no longer attached to one or several learning site, and they can be mobile and learn at the same as long as the mobile devices are around. Mobility of learning is the result of mobility of both the technology and learners (El-Hussein & Cronje, 2010).

Mobile learning is also defined as the exploitation of ubiquitous hand-held technologies, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning. However, it has been widely recognized that mobile learning is not just about the use of portable devices but also about learning across contexts (Walker, 2006).

Pea and Maldonado (2006) used the term wireless interactive learning devices (WILD), an acronym created at SRI International's Centre for Technology in Learning, to define technology that made it possible for learners to work at unique activities in ways that were previously impossible. Mobile learning can occur in the classroom, during an online course or anywhere. The learner does not even have to be at a predetermined location. It is not about the device, but about the connectivity, capabilities and experience. Access through mobile devices should be a choice and a part of the total learning environment (Brown, 2005).

Corbeil and Corbeil (2007) predicted that mobile learning would one day provide learning that was truly independent of time and place, facilitated by portable computer capable of providing rich interactivity, total connectivity and powerful processing. Keegan (2002) anticipated that mobile learning is a harbinger of the future of learning. The applications of mobile learning ranges widely from high school to higher education and corporate learning settings, as well as from formal and informal learning to classroom and distance learning. Instructional designers and teachers need a solid theoretical foundation for mobile learning in the context of distance education and more guidance about how to utilize emerging mobile technologies and integrate them into their teaching.

Goh and Kinshuk (2006) summated that utilizing mobile devices in education is mainly considered as enhanced tools which can be categorized into six as; games and competition in learning, classroom learning, laboratory learning, field trip learning, distance learning and informal learning. Games and competition implies that learning in young people using phone-based games improve their spelling, reading and mathematics skills. Classroom learning enhances the use of mobile devices in the laboratory environment to support individual learning as well as collaborative learning. One example of classroom learning would be using mobile devices like smartphone to brainstorm, take quiz, and vote. Laboratory learning is similar to classroom learning but has data acquisition as extra function.

Distance learning uses mobile devices to support synchronous and asynchronous learning. An example is using videophone to deliver home education for students with severe physical impairment. Informal learning is enabled with context aware technologies. The setting of informal learning can include gallery, garden, aquarium, museum, and so on.

The difference between m-learning and traditional classroom learning cannot be over emphasized. M-learning is learner-centric learning as opposed to classroom lecture-form of learning which is teacher-centric. The traditional forms of learning require learners to be present at a fixed location. Conventional e-learning enables learners from a distance with personal computer (PC) and internet connection so that they can learn and interact with others online. However, the size and weight of PCs is a limitation because learning process is tied to computers' location. Mobile devices solve this problem and promote learning anytime and anywhere (El-Hussein & Cronje, 2010). If m-learning could be achieved via the use of mobile devices in university campuses, students would most probably see it as a great advantage. Another advantage of m-learning technologies over conventional e- learning is the ability to incorporate context-awareness. Context-awareness involves having sensors in mobile devices such as smartphones, tablet computers among others that are capable of detecting the student learning behaviours in the real world and then stimulates more adaptive learning activities (Hwang, Wu & Chen, 2007).

Wenger and Snyder (2000) stated that there are two categories of mobile learning, which are also referred to as primary delivery strategies. Mobile learning can be in form of performance support system, which means using mobile devices to deliver performance support (PSS) or as communication that creates knowledge such as teaching through communication. M-learning performance support systems (PSS) are similar to traditional performance support services (PSS). M-Learning solutions integrate mobile devices to help users perform tasks such as providing information, guidance and learning experiences when and where they are needed. When users implore the cell phone to find a phone number, check the date and time or calculate, they experience m-learning as performance support. On the other hand, when users call using a cell phone while travelling to ask expert's advice or send e-mails via Blackberry smartphones, iPods, tablet computers, among others during a class meeting or asking for definitions or examples, they experience m-learning as communication that creates knowledge.

Mobile technologies include any number of the wide range of portable devices that are designed to provide access to information in any location or while on the move. Typical examples of the mobile technologies and devices used for mobile learning include cell phones, smartphones, palmtops and hand-held computers; tablet personal computers, laptops, and personal media players can also fall within this scope (Kukulska-Hulme & Traxler, 2005). Mobile phones connect students with teachers and other students and help them deal with class attendance issues, rearrange meetings, retrieve schedule and assignment data, discuss assignments, coordinate study groups and seek help with academic and life problems (Kazt, 2011). The potentials of mobile devices cannot be over emphasized. In addition to telephoning, modern mobile devices also support a wide variety of other services such as text messaging, multimedia system, email, Internet access, short-range wireless communications (infrared, Bluetooth), business applications, gaming and photography. Mobile phones that offer these and more general computing capabilities are referred to as smartphones.

Smartphones combine telephone capabilities with a PDA (Personal Digital Assistant), Camera, Video, Mass storage, MP3 player, internet access, and networking features in one compact system (Corbeil & Corbeil 2007). Students can download audio and video lectures and podcasts which include listening to audio recordings of lectures for future use thereby providing supplemental information to enhance traditional lecturers into their mobile devices. They can also play video and flash movies; display and edit text documents, access e-mail and web content; send instant messages and text messages; and use the devices for mass storage. Walker (2006) stated that mobile devices provide opportunities for students to rehearse oral presentations take quizzes, shoot photos for class projects and create podcasts.

Educators across the world are already using mobile devices for learning. Teachers give oral quizzes via devices like cell phone (Kolb, 2008). Mobile devices were tagged by Kolb (2008) as the "Swiss Army knife of education," because they can be used inside or outside the classroom. The usage in classroom allows students to make the connection between learning and everyday life. Walker, (2006) posited that mobile devices like cell phones, smartphones and tablet computers, among others today really are mini-computers. This is because, they have the same amount of power computers had 10 years ago. Goh and Kinshuk, (2006) suggested ten pedagogical guidelines for educators that want make use of the mobile learning technologies, thereby providing a list of dos and don'ts which will afford them the opportunity to learn new things. These include costs, usability, choice of technology, roles, equipment management, support for teachers, administration, collaboration, services and applications and security and privacy.

Mobile technology, with its persuasive acceptance and powerful functionality, is inevitably changing people's behaviours. Young adults are especially dependent on mobile devices today. CourseSmart (2011) revealed that university students cannot do without their mobile devices, including smartphones, laptops and more. It's very common to see university students checking email, Facebook, Twitter, or other social network sites using mobile devices with their constant web connection feature nowadays. Alexander (2011) found that 57% of university students use smartphones, 60% feel addicted to their phones, 75% sleep next to their phones, 88% texted in class before, 97% who have smartphones use them for social networking, and 40% used smartphone to study before test.

Harley, Winn, Pemberton and Wilcox (2007) found that text messaging has the potential to aid high school graduates in making smooth transition from high school to university. The University of Brighton uses a desktop computer application called student messenger which allows professors and administrators to send text messages, such as reminders, due dates, meeting, times, etc., directly to freshmen. The students who used this system gave overall positive feedback because its gives a sense of belonging and also made them felt they would do better academically. Liu and Hwang (2010) found that modern technology-aided learning are in three stages ranging from conventional e-learning to m-learning to context-aware u-learning. Conventional e-learning refers to using computer and the Internet for learning. This is where computer plays a vital role in modern education and pedagogy. M-learning (or mobile-learning) is realized with mobile devices and wireless communication. Context-aware u-learning (or ubiquitous-learning) requires mobile devices equipped with sensor technology and wireless communication.

As mobile learning grows, mobile devices such as cell phones, smartphones and personal tablets computers and one of their prominent features like text messaging, also known as SMS will play a significant role in this new learning phenomenon. Kukulska-Hulme and Traxler, (2005) found that students are most interested in using mobile devices like cell phones because of their flexibility. This is because text messaging as one of their functions has overtaken e-mail and instant messaging as the main form of communication, as 94% of students send and receive text messages. Despite being a new tool in education, institutions, administrations, staff and faculties are experimenting with text messaging in variety of ways. Carvus and Ibrahim (2009) pointed that text messaging was used to help students learn new English words. Using special software on the instructor's computer, a new word was sent out to students every half an hour via text message in order to help students become familiar with new English words. The experiment received favorable marks from participants who expressed their satisfaction and enjoyment of learning away from the classroom.

Ash (2013) reported that the proliferation of tablets, smartphones and other mobile devices has increased the number of games, apps, and software to help students learn and increase their literacy skills. As technology continues to evolve, these tools are becoming more interactive, animated, and sophisticated. In the contemporary world, mobile devices like smartphones have made lives of people much easier and comfortable. Nusca (2009) stated some of the key features of that has been enabling mobile devices there numerous functions such as Operating system, Apps, Web Access, QWERTY keyboard, messaging, camera, etc.

Operating System of mobile devices like smartphones are based on operating systems which allow them to run applications. Apple's iPhone runs the iOS, BlackBerry smartphones run the BlackBerry OS. Other devices run Google's Android OS, HP's webOS, and Microsoft's Windows Phone. While almost all cell phones include some sort of software. They also allow users to create and edit Microsoft Office documents or at least view the files, download apps, such as personal and business finance managers, handy personal assistants and even edit photos, get driving directions via GPS, and create a playlist of digital tunes.

Also, accessibility to Web at higher speeds, thanks to the growth of 4G and 3G data networks, as well as the addition of Wi-Fi support to many handsets. Users can browse favorite sites at their convenience. Russell (2013) stated that for sometimes, short messaging services (SMS) is fading away for many on mobile devices (like smartphones such as blackberry phones, iPhone, tablet computers and more). Thus, revealed 22 of the best mobile messaging apps replacing SMS which include BBM, facebook, Line, Messageme, Nimbuzz, Skype, Viber, Wechat and Whatsapp. Although, people still use it, but there are a lot of apps that go way beyond it, offering easy multimedia functions, group chats, video calls, gaming and much more.

With integration of new things, there are advantages and disadvantages. As text message, cell phones, and mobile learning move through their initial stages of pedagogical development, issues need to be addressed. One of the issues with text messaging is dealing with its own lingo for example, "your" "spelled" "UR", problems cut down to "Probs" and students' ability of letter writing has fallen which has negatively affected the standard of education. Labrow (2004) expressed his concern on these issues. But these low standards pervade our everyday lives. As for the use of mobile devices like cell phones in education, Noble (2009), does not object to the use but has some concerns about its negative effects on teaching and learning, stating that there are serious concerns about their misuses which include cheating on exams, cyber bullying or just being disruptive in class. With some of the positives and the negatives of using text messaging in education outlined, there is need to validate its pedagogical and technological integration in education. Labrow (2004) sums up this view when he stated that, mobile learning could be great but the pedagogy needs to be gotten correctly and that educators should not be seduced by the speed and availability.

Banerjee (2013) stated some advantages and disadvantages of mobile devices such as the immediate acquisition and application of new skills or knowledge (training), use of quality media (audio, visual and audio-visual) when appropriate, access to experts (location), build a community of practice, and learning without a predetermined location. Among the disadvantages identified is the difficulty in accessibility of information from the web, small screen sizes, cost of purchase and maintenance, so also the challenges of the security of the device.

Integration and Adoption of mobile devices into Teaching and Learning

Some inventions take the world by storm and others seem to fail, lie dormant for decades, but when their time has come their use grows quickly, even explosively. A broad social psychological/ sociological theory called Diffusion of Innovations (DOI) Theory of Diffusion Theory (DI) purports to describe the patterns of adoption, explain the mechanism and assist in predicting whether and how a new invention will be successful. Liden (2003) posited that the theory has potential application to information technology ideas and techniques and has been used as the theoretical basis for a number of studies. Diffusion of Innovations Theory is concerned with the manner in which a new technological idea and technique or a new use of an old one, migrates from creation to use. It is concerned with the spread of innovation, ideas and technology through a culture or cultures. The theory states that technological innovation is communicated through particular channels, over time, among the members of a social system. The Diffusion theory states that there are many qualities in people that cause them to accept or resist an innovation. The theory also states five stages to the process of adopting an innovation which are knowledge when an individual becomes aware of an innovation but has no information about it, persuasion is the second stage whereby an individual becomes actively interested in seeking knowledge about the innovation and later decides after weighing the advantages and disadvantages of the innovation and decides whether or not to adopt it. The next is the implementation which entails the individual to actually do adopt and use the innovation. Lastly is the confirmation stage which involves making a final decision about whether or not to continue using it based on his own personal experience with it.

These same stages apply to varying degrees, group of people in addition to individuals. There are many factors of innovations themselves that determine how likely people are to adopt them and how quickly people will adopt them. Generally, if an innovation is better than whatever standard preceded it, it will eventually be adapted. However, if the innovation goes against the moral values of the people, it will be less likely to be adapted. The ability to try the innovation without committing to it right away also influences the likelihood of people adopting the innovation.

Corbeil and Corbeil (2007) reported that the mobile revolution had finally arrived. New generations of young people who have grown up with digital technology have high expectations of anytime, anywhere learning. The educational school of thought believes in tapping every available resource, including mobile technology. The use of mobile devices in teaching and learning is in its infancy and depends entirely on the development and impact as an educational tool. Nigerian Tribune (2007) affirms that it is evident that mobile learning can facilitate learning. The possibility to become educated via mobile learning (i.e. learning through mobile devices) has become a viable option, as the devices are what people of this era have in common. The existing features of the mobile devices like smartphones, tablet computers among others show the possibilities for learning through their usage. The main advantage of mobile devices in learning process is their portability, which enables them to be used for learning outside the classroom.

Chadwick (2010) agreed that mobile devices, such as smartphones, have tremendous potential in the classroom for secondary and post-secondary education. He further opined that educators need to adopt the use of mobile devices into the classroom and it is achievable by properly equipping students with necessary media literacy skills that will promote positive virtual citizenry for them to face the challenges of 21st century. Fulton (1997) stated that the effective integration of mobile devices into classroom is as a result of many factors but most importantly, teachers' competency and ability to shape instructional materials to meet students' behavioural needs. The application of mobile learning range widely, from Elementary to University Education (classroom, distance learning and filed study), corporate learning settings, formal and informal learning (Keegan, 2002).

In Nigeria, lecturers and students at tertiary institutions do not have awareness of how courses could be taught using mobile technologies to support learning and lack the skills in using mobile devices for teaching and learning processes. This is why they are still much reliant on traditional lesson methods. Some of the challenges also include the cost of the devices. They often ask questions such whose responsibility to purchase the devices, is it students, teachers or school authority? However, there is need to adopt mobile learning as an option and when this new instructional teaching strategy is used in the teaching and learning in our Nigerian tertiary institutions, teaching will be enhanced, effective and meaningful result will be obtained. Poor performance of our students in the External Examination will change for better and excellent result will be attained.

Perceptions of lecturers on Integrating of Mobile Devices for Teaching

Lecturers are a critical factor in qualitative education delivery. Improvement in the performance of learners can only be achieved with improvement in lecturers' preparation as "no education system can rise above the quality of its teachers" (FRN, 2009 p 41). Alimi and Balogun (2010) opined that lecturers who are the personnel in-charge of teaching and implementing educational policies designed to attain educational goals cannot be neglected, if the educational goals and in fact, national development goals are to be attained. The success of the education system depends on teachers as they are in the centre of education enterprise. STAN (1992) opined that: "No matter how good a policy, how innovative a curriculum is, the success of any education venture is in the hands of the teacher, his convention and preparedness" (p.84). A lecturer cannot teach effectively without using his or her initiative and additional professional qualifications. For a dynamic teaching/learning environment, lecturers must be well-informed and resourceful, especially in the present information technology age that has eaten deep into Nigeria and every operation has become electronic (Onocha, 2013).

For many years, educators and researchers have carried out series of study on the variables that influence student performance. Adeyemi and Adu, (2012) opined that lecturers as one of the inputs into the educational process constitute an important aspect in students' learning. This has explained why the National Policy on Education (FRN, 2009) emphasised the need to accord teacher education a prominent place in educational training. The lecturer is the first resource to consider when it comes to effective teaching and learning in the university system because he/she has a direct connection with the students. In modern teaching and learning, emphasis has now shifted from the lecturer (instructor) as the center of learning and teaching, to the student. The current trends are to move away from the dull instructional routine that emphasizes lecturer dominance and excessive content coverage to a teaching and learning style that allows the engaging activities in a well-orchestrated, cohesiveness and in which the teaching and learning environment is stimulating and enriching (Ilukena, 1998). Rice (2003) found five broad categories of lecturers' attributes that appear to contribute to teacher quality. These attributes include experience, preparation programs and degree, type of certification, coursework taken in preparation for the profession and lecturers own test scores.

Wayne and Young, (2003) also targeted the lecturer quality in their analysis of studies that examined the characteristics of the effective lecturers and ratings of lecturers undergraduate institutions such as test scores, degrees and course work and certification status. Hattie and Jaeger (2003) identified five major dimensions of an experienced lecturer which include ability to identify essential representation of their subjects, guide learning through classroom interaction, monitor learning and provide feedback, attend to affective attributes and influence student outcome.

Lecturers have to demonstrate not only professional competencies and skills but also social responsibility as mirrors of the society (Ilukena, 1998). Many occupations recognize employees' years of experience as a relevant factor in human resource policies, including compensation systems, benefits packages and promotion decisions. The idea is that experience gained over time enhances the knowledge, skills and productivity of workers (Rice, 2010). Studies on the effect of teaching experience of lecturers on student learning have found a positive relationship between lecturers' effectiveness and their years of experience, but the relationship observed is not always a significant or an entirely linear one (Murnane & Phillips, 1981). The evidence currently available suggests that while inexperienced lecturers are less effective than experienced lecturers, the benefits of experience level off after a few years (Rivkin, Hanushek, & Kain, 2000). Onanuga (2006) is of the opinion that the more the number of years spent on the job renders most lecturers ill-productive in all aspects and thus they become lazy and uncommitted to the teaching profession. Akubuilo (2005) on the other hand opined that the years of teaching experience play a significant role and is a factor in lecturers' productivity. At this digital age, teaching, learning and various educational activities should revolve around mobile devices.

In this vein, a teacher or lecturer as the case may be, can create a Facebook page, which he regularly updates and post assignments, tutorial questions, suggestions for further reading and also receive feedback from the students through the use of mobile devices (Adeyanju, 2012).

However, mobile devices offer plenty of opportunities for learning and interactivity. Osborne (2011) believes the younger generations use such technology in the classroom to remake the educational landscape by distributing model of connection, posting any activity feeds that enables them build an on-going relationship with stakeholders through low stakes participation. Mobile devices resources are often provided for passive use as information sources or teaching resources perhaps, an alert to an upcoming event, a blog post that directs the reader academic literature or a video that demonstrates a key technique or concept. Laurenti, (2011) stated five top uses of mobile devices in education which include enhanced collaboration (creating a better enhanced collaborative environment beyond individuals capability); enhanced flipping (increasing teacher-student relationship, as some educators are exploring a new way to teach, called "flipping" the classroom. In this strategy, students view recorded lectures or read curricular material outside the classroom with the use of Apps installed on the mobile devices); Real time information (enabling students to communicate with lecturers outside the classroom); collaboration between educators (communication of ideas among educators) and Open Source Social Media (A public social media website like Facebook or Twitter may not be appropriate for a classroom setting, but there are many open source social media services that allow collaboration between individuals).

In conclusion, mobile devices applications provide easy, fast and efficient ways to access a great diversity of information and situated knowledge. They also provide learners with opportunities to develop their competencies in collaboration with other learners, practitioners and stakeholders. Furthermore, they allow individuals to acquire competence in holistic manner (Ala-Mutka, 2010)

Perceptions on the ease of use play key roles in human functioning because it affects behaviour not only directly, but by its impact on other determinants such as goals and aspirations, outcome expectations, affective proclivities, and perception of impediments and opportunities in the social environment (Bandura, 1995, 1997). Cazares (2010) opined that users with low level of confidence are less likely to use technology and will typically believe that technology is difficult to use. Therefore, perceptions on the ease of use of technology of these set of people could be low. However, Claggett and Goodhue (2011) believed that the issue of confidence in respect to self-efficacy is quite different from skills and abilities individual have acquired to perform ICT related activities. Self-efficacy is a key determinant to one's perception and any kind of activity individual engages in, effort put in ensuring success in the activity and abilities possessed to face challenges when the need arises (Downey & McMurtrey, 2007). Fear of failure and lack of ICT knowledge formed some of the attitudes that led to the reasons why lecturers lack confidence of adopting and integrating ICT into their teaching (Balanskat, Blamire & Kefala, 2007).

Mudi (2013) investigated teachers' perceptions towards integrating mobile phones into teaching in public senior secondary schools in Federal Capital Territory, Abuja. 682 teachers were sampled using stratified random sampling techniques to generate information on their perception. The findings revealed that secondary school teachers have perceptions towards integrating mobile phone for teaching; there is no significant difference between male and female teachers on their perception; less, moderate and high experienced teachers have similar perceptions toward integrating mobile phones into Nigerian schools. However, there was significant difference in the perception of teachers with NCE, Bachelor degree and masters' degree holders with bachelor and masters degree teachers have high perception towards integrating mobile phone into school system.

Bamidele and Olayinka (2012) investigate teachers' perception of integrating the use of mobile phones into teaching in public senior secondary schools of Oyo and Lagos state, Nigeria. Four hundred and twenty-one teachers (220 in Oyo state and 201 in Lagos state) teaching in public senior secondary schools of Lagos ad Oyo states were used as population sample. Moderator variables such as age, teaching subject, educational qualification, teaching experience and gender were used to elicit responses from respondents using a questionnaire made up of 36 items Likert scale. The Technology Acceptance Model designed by Davis (1989) was adopted for the study. 421teachers were randomly, clustery and purposively selected to represent sampled schools and population. The data were analyzed using mean, standard deviation, t-test and one-way ANOVA in testing the hypotheses. The findings showed that teachers use mobile phones for personal use but not willing to use for teaching.

Also, teachers do not agree that, they may phobia or anxieties if using mobile phones for teaching, reason being that they are already used to the device. If using mobile phones, performance of teachers could be commented on through feedback mode, also, students will never miss class as they have the lesson modules to download any day, anytime. It was recommended among other things that, Nigerian government should review the existing curriculum in order to include possible instructional supports that could help teachers to teach effectively, one of such prospect is mobile phone. Diverse ways of making teaching learners' centered should be explored by administrators and stakeholders of education so as to get best practice of using technology in teaching. If accepted or not by administrators, barriers identified should be eliminated completely.

Oyinlola (2012) reported that a number of mobile devices were available for use by the students in the selected Universities, these include laptop, cell phone, MP3 and MP4 a lot of others. 94.6% of the students attested to the availability of laptop computers while 100% of the students owned and used a cell phone. 87.8% of the students confirmed that they have internet access through WIFI connection on their mobile phones.

Lecturers' attributes as factors to integrating mobile devices into teaching

Lecturers' attributes are also factors that contribute to the integration of mobile devices in education. Amongst these attributes is gender, teaching experience and area of specialization. Gender is likely to have major implications for education and ICT in the future and in order to ensure good communication between lecturers and students, it is vital to have an understanding of how different groups may approach the use of ICT. Gender has been identified as one of the factors influencing lecturers' perception. Perceptions on integrating of mobile devices for teaching are issue to gender analysis and when observing communication habits, it is important to be aware of the different ways in which male and females view the mobile devices. Some studies have shown very significant differences in the use of ICT with regard to gender.

Ayinde (2011) investigated the computer self-efficacy among teachers in primary, secondary and tertiary institutions in Niger State, Nigeria. Three 321 teachers were asked to indicate their experience and level of proficiency in the use of computer, 96 teachers from primary schools, 123 teachers from secondary schools and 102 from tertiary institutions. The data were collected through perception of computer self-efficacy scale developed by Bamidele and Olayinka (2012) which has 20-item. The data obtained were analyzed using t-test and ANOVA. The findings showed that, Male and female teachers in secondary school have similar competence in the use of computer. Male primary school teachers were more proficient in the use of computer than their female counterparts. The female lecturers were more proficient in the use of computer than the male lecturers. This is contrary to Chukwuemeka (2010) findings which showed that the female teaches having inadequate proficiency skills in using internet for teaching and learning process.

Gambari, Gbodi and Yaki (2008) investigated lecturers' Internet level of competency in Nigeria Universities (A case study of Federal University of Technology (FUT) Minna, Niger state). One hundred lecturers, (50 male and 50 female) from FUT, Minna, Niger state participated in the study. Data were collected for the study through the administration of 10-item questionnaire. The data were analyzed using mean, standard deviation, t-test ad one-way ANOVA in testing the hypotheses. The findings showed that male lecturers are more competent in using Internet than their female counterparts. Also, less experienced lecturers are more exposed to the use of internet than moderately and highly experienced lecturers. It was recommended among other things, that lecturers should be encouraged to acquire Internet skills; computers and Internet connectivity should be made available to lecturers; and old lecturers should be encouraged to develop and follow the new trends of technology in order to be relevant in this computer age.

Ogunlade (2009) summated that female are underrepresented in school computer courses, computer clubs and in computer science based careers and do not spend as much time at home using computers as male do. Hou, Huang and Lin (2006) also stated that female treated computers as a device to complete a task while male considered computers as recreational devices. Male use technology for fun while female tends to use it as a means of communication. Male generally achieve better in computer and hold more positive attitude towards computer than their female counterparts. Men were more likely to be persuaded to use the mobile phone devices they saw others using it. Women were not influenced. Men are stereotypically expected to possess technological competence and know how, skills and interest (Uden, 2007).

Leung and Wei (2000) revealed that men tend to use mobile devices as an instrument to do business (teaching included) while women tend to make social calls. In addition, Kolb (2008) also discovered that women have more attachment to their mobile devices like cell phones than men, especially to text messaging. Michaud (2009) identified that, there is a gender difference in technology adoption practices, there is also a gender difference in technology preferences. Females have a lower rate of use for audio and video creation and multi-user gaming than males, to the extent that two times as many males as females use video creation and multi-user gaming. However, Oyinlola (2012) revealed that, there is no significant difference in the perceptions of students based on their gender.

Research Questions
The study sought answers to the following research questions:
1. What is the perception of lecturers on the ease of use of mobile devices for teaching?
2. Does gender influence lecturers' perception on the ease of use of mobile devices for teaching?

Research Hypothesis
The following hypothesis was tested in the study
Ho_1 There is no significant difference between male and female lecturers in their perception on the ease of use of mobile devices for teaching

Demographic Table
The data presented in this section provides a summary of the major characteristics of the lecturers that were involved in the study. The questionnaire was directed to this set of respondents to ensure that necessary information was captured and measured accurately. The demographic representation of lecturers was presented in table below.

Table 1:
Distribution of Respondents (Lecturers) by Universities

Universities	Lecturers	%
Al-hikmah University, Ilorin	54	15.2
Kwara State, University, Malete	83	23.3
Landmark University, Omu-Aran	62	17.4
University of Ilorin, Ilorin	157	44.1
Total	356	100

The distribution of the lecturers according to the Universities shows that 44.1% of them were from the University of Ilorin, 15.27% were from the Al-hikmah University, Ilorin, 23.3% were from Kwara State, University, Malete while 27.2% were from Landmark University, Omu-Aran

Table 2:
Distribution of Respondents (Lecturers) by Gender

Name of University	Gender				
	Male	%	Female	%	Total
Al-hikmah University,	37	68.5	17	31.5	54
Kwara State, University	46	55.4	37	44.6	83
Landmark University	21	33.9	41	66.1	62
University of Ilorin	89	56.7	68	43.3	157
Total	193	54.2	163	45.8	356

The distribution of lecturers involved in this study according to gender shows that there was a difference in the distribution along gender lines. The results in table 5 show that (193) 54.2% were males in all the universities while (163) 45.8% of them were females. The results in the table also show that the University of Ilorin has 56.7% of the lecturers as males and 43.3% of the lecturers as females; Al-hikmah University has 68.5% of the lecturers as males and 31.5% of the lecturers as females, Kwara State, University has 55.4% of the lecturers as males and 44.6% of the lecturers as females, while Landmark University has 33.9% of the lecturers as males and 66.1% of the lecturers as females.

Research Question 2: What is the perception of lecturers on the ease of use of mobile devices for teaching?

Table 3:
Perception of Lecturers on the Ease of Use of Mobile Devices for Teaching

S/N	Items	Mean
1	The flexibility of mobile devices will ensure easy dissemination of knowledge and information to students	2.64
2	It would be easier to remember how to perform teaching tasks using mobile devices	2.27
3	Mobile devices will be easier to use because it is internet enabled	2.64
4	Using mobile devices make learning clearer and understandable	2.56
5	It is easy for me to become skillful at using mobile devices for teaching	2.40
6	It is easy to remember how to perform tasks using mobile devices	2.16
7	Using mobile devices for instruction would requires a lot of skills and effort to ensure learning takes place	2.70
8	Assessment and other modes of evaluation will be made easier with mobile devices	2.75
9	It is easy to customize mobile devices for educational uses	1.92
10	It will demand a lot of training and re-training to become skillful in using mobile devices for teaching	1.96
11	It will not demand a lot of effort to become skillful in using mobile devices for instructional process	2.97
12	It takes a lot of effort to become skillful in using mobile devices for instructional process	2.48
13	The application of mobile devices for teaching is relatively easy for me	2.61
	Grand Mean	2.47

Table 8 shows that item 11 which sought to know it will not demand a lot of effort to become skillful in using mobile devices for instructional process has the highest mean score of 2.97. This was followed by items 8 and 7 which sought to know if assessment and other modes of evaluation will be made easier with mobile devices and that using mobile devices for instruction would requires a lot of skills and effort to ensure learning takes place has mean scores of 2.75 and 2.70 respectively. This was followed closely by items 3 and 1 which south to find out if mobile devices will be easier to use because it is internet enabled and the flexibility of mobile devices will ensure easy dissemination of knowledge and information to students both have a mean score of 2.64. The lowest mean score was item 9 which sought to find out It is easy to customize mobile devices for educational uses has a mean score of 1.92. The grand mean score of the perception of lecturers on the ease of use of mobile devices for teaching was 2.47. This implies that lecturers perceived mobile devices to be easy to use for teaching.

Hypothesis Testing
The results related to hypothesis formulated in this study based on research question 2 and are shown in subsequent tables. Hypothesis was tested at 0.05 level of significance.
H_{O1} There is no significant difference between male and female lecturers in their perception on the ease of use of mobile devices for teaching

Table 1:
Lecturers' Perception on the Ease of Use of Mobile Devices for Teaching based on Gender

Gender	N	$\overline{X}$	SD	df	t	Sig	Remarks
Male	193	31.29	4.83				
				354	1.07	0.44	Accepted
Female	163	31.75	4.61				

From table 1, it can be deduced that there was no significant difference between male and female lecturers' perceived ease of use of mobile devices for teaching. This is reflected in the result: df (354) t= 1.07, p>0.05. Thus, the hypothesis is accepted. This means that the null hypothesis which states that there is no significant difference between male and female lecturers in their perception on the ease of use of mobile devices for teaching is accepted. The implication is that male and female lecturers perceived mobile devices for teaching to be easy to use.

Discussion of Research Findings
The findings of this study are discussed under the following headings.
1. Discussion on the perceptions of lecturers on ease of use of mobile devices for teaching
2. Gender influence on the perceptions of lecturers on ease of use of mobile devices for teaching
3. Discussion on the perceptions of lecturers on ease of use of mobile devices for teaching

Activities like using mobile devices for teaching and conducting research by surfing for first-hand information through the internet and the easiness. The resulting mean implies that lecturers perceived mobile devices easy for teaching. Moreover, resources needed for smooth diffusion and adoption should be made available. This is in line with Mudi (2013) on teachers' perceptions towards integrating mobile phones into teaching in public senior secondary schools in Federal Capital Territory, Abuja. The findings revealed that secondary school teachers have perceptions towards integrating mobile phone for teaching; there is no significant difference between male and female teachers on their perception; less, moderate and high experienced teachers have similar perceptions toward integrating mobile phones into Nigerian schools.
Traxler (2007) also found that some view mobile learning as mobility of learning in terms of learner's experiences of learning with mobile devices which support a wide variety of conceptions of teaching uniquely placed to support learning that is personalized, authentic and situated. Also, Ash (2013) reported that the proliferation of tablets, smartphones and other mobile devices has increased the number of games, apps, and software to help students learn and increase their literacy skills.
However, based on the usage by student, Labrow (2004) expressed concern on the with sending messages through the use of various apps for example "your" spelled as "ur", "problems" cut down to "probs" and students' ability of letter writing has fallen which has negatively affected the standard of education. Noble (2009) also stated that there are serious concerns about their misuses which include cheating on exams, cyber bullying or just being disruptive in class. This implies that if integrated into teaching, it would be a welcome idea by lecturers. Therefore, necessary efforts should be made on the training and retraining lecturers to become vast and highly proficient in the use of mobiles devices.

Gender influence on the perceptions of lecturers on ease of use of mobile devices for teaching

Research question 1 & 2 and the hypothesis examined whether there is a significant difference in the perceptions of lecturers on the ease of use of mobile devices for teaching based on gender. Findings revealed that there was no significant difference between male and female lecturers' perceived ease of use of mobile devices for teaching. The implication is that male and female lecturers perceived mobile devices easy to use for teaching. This is in line with the findings of Yusuf and Balogun (2011) in which no significant difference was established between male and female student-teachers' attitudes and use of ICT. Ayinde (2011) investigated the computer self-efficacy among teachers in primary, secondary and tertiary institutions in Niger State, Nigeria. The findings showed that, male and female teachers in secondary school have similar competence in the use of computer. Also, Bamidele and Olayinka (2012) found that male and female teachers in secondary school have similar competence in the use of computer. However, male primary school teachers were more proficient in the use of computer than their female counterparts.

This is contrary to Chukwuemeka (2010) findings which showed that the female teaches having inadequate proficiency skills in using internet for teaching and learning process. Also, Gambari, Gbodi and Yaki (2008) reported that male lecturers are more competent in using Internet than their female counterparts.

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ASSESSMENT OF TEACHERS' SELF-EFFICACY AND GENDER INFLUENCE ON THE UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN 21ST CENTURY

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Abstract
This study examines secondary school teachers' self-efficacy and gender influence on the Utilization of Information and Communication Technologies (ICTs).This study investigates science teachers' self-efficacy and influence of Gender on the utilization of ICT in the use of ICT for teaching and learning. The population for the study involved all the science teachers. The sample for the study consisted of 575 science teachers from Government owned secondary schools in two selected states in the North-central Nigeria. The Instrument used for the study was an adapted questionnaire and the data were collected personally with the help of research assistants. The data collected was analyzed using mean scores and T-test .The outcome of the study showed that science teachers self-efficacy on the use of ICT was highly positive. There was a significance difference between male and female teachers in the use of ICT for teaching. The male had high self-efficacy than the females' counterparts. Thus, female teachers reported less use of ICT in their instruction than male teachers. It was recommended among others that teachers should develop more interest to maintain and improve their skills to make ICT more easier to use for teaching –learning processes. The female teachers need to be given more support , encouragement and be trained to integrate ICT in their instruction to meet demand of 21st century.
Key words – Information and communication technology (ICT), Self-efficacy, gender

Introduction

The Nigerian Educational system is failing to adequately equip students with the essential 21st century knowledge and skills necessary to succeed in their academic career. Contemporary knowledge society calls for the 21st century skills for learning, creativity, critical thinking and collaboration in the Information and Communication Technology (ICT).These skills are also crucial for teachers in terms of developing new teaching pedagogy and assessment tools, so as to prepare the citizens to be able to function in this knowledge-driven society (Krokfors & Myllari, 2010).

The level of technological development of a nation measures the level of scientific literacy obtained in that society (Ogunleye, 2001). Hence, science is defined as a body of knowledge, a way or method of investigating, and a way of making judgement in the pursuit of the understanding of nature (Abimbola & Omosewo, 2006). Science is a great enterprise which nations depend on in order to advance technologically. Therefore, it receives much emphasis in education due to its significance and relevance to life and society (Nwagbo, 2008). The basic science subjects comprise Biology, Chemistry, and Physics (National policy on Education (FRN), 2012). Thus, science continues to contribute to human well-being, especially in the areas of medicine, shelter, leisure, security, education, transportation, telecommunications, agriculture and so on (Obianke, 2009 & Oyedeji, 2010).

ICT can be defined as a means of accessing or receiving, storing, transferring, processing, sending ideas, perception or manipulating and transmitting of information through electronic based tools (Fabunmi, 2012). These tools are classified as hardware and software. The hardware includes central processing unit (CPU), monitor, keyboards, and printers, radio, telephones while the software comprises Microsoft word, excel, Corel draw, Social Sciences Statistical Package (SPSS), Opera Mini and Google chrome among others. These are very essential in the educational development programme hence they are referred to as ICT in education. ICT in education is defined as a comprehensive approach to innovate education systems, methods, and management with the aid of new technology (Abubakar, 2010).

The importance of ICT cannot be overemphasized in our society. It plays a vital role in the development of any nation and it has been an instrument for achieving social, economic, educational, scientific and technological development (Adedeji, 2010). ICT provides innumerable benefits in enriching the quality and quantity of instructional materials accessible to both teachers and learners (Onasanya, 2009).This versatile instrument has the capability not only of engaging students in instructional activities to increase their learning, but helping them to solve complex problems to enhance their cognitive skills.

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Assessment of Teachers' Self-efficacy Efficacy and Gender Influence on the Utilization of Information and Communication Technologies in 21st Century

In spite of the enormous role of ICT in Education, there exist attendant barriers to it usage. Some of these barriers as stated by Peralta and Costa (2007) include poor maintenance and repair culture in which spare parts and technical experts from the manufacturers are imported whenever the technologies breakdown leading to waste of resources, incessant electricity supply, poor infrastructural support base, and time constraints. The revised National Policy on Education (FRN 2009) gave prominence to computer education especially, in the 2004 edition; computer education was made one of the pre-vocational subjects at the basic level of education and a vocational elective at the senior secondary level. This shows the Government's recognition of the pervasive influence of computer technologies in this contemporary age and its commitment to the integration of technology in all its schools.

Learning process is based on both the structural condition derived from the learning infrastructures and the personal characteristics of the users involved. This invariably means that for effective use of technologies, the users require positive attitudes or a strong sense of efficacy, (personal) belief to grasp the new technology and use it as a means of achieving objectives (Prompt ,1996).

Self-efficacy has to do with a person's belief of his or her capabilities to successfully accomplish a particular task (Delcourt & Powers 1994). In order for teachers to use computers successfully for teaching, they need to have self-confidence in computer related tasks (Compeau & Higgins 1995). The greater people perceived their self-efficacy to be, the more active and longer they persist, the more task that are executed. Self-efficacy affects every facet of human endeavour by determining the beliefs a person hold regarding the ability to affect situations which invariably influence both the power a person actively has to face challenges. Therefore, an important construct of self-efficacy has been a parameter for individual's ability to successfully complete a task. It is an individual expression of what one is capable of doing. Self-efficacy is not a static concept, it is continually being actualized in an individual's mind, which Bandura called "mastery experience". For example, if teachers value their interpersonal skills and believe that they are capable of pursuing a goal to its logical conclusion, their self- efficacy in that area will likely contribute to positive goal attainment. In the utilization of ICT, variables such as gender, are important determinants of the rate ICT is used in learning (Schaumburg, Babetos & Antomous, 2008). Thus, gender is defined as social attributes and opportunities associated with being male or female (Daramola, 2011). There is a 'technological gender gap' between males and females, with female subjects falling behind their male peers in ICT utilization (Enochson, 2008; Reimer & Steinmetz, 2007). Studies have shown over the years that males dominate in the use of ICT. Even in a situation where males and females are given equal opportunity, men are more likely to be the main ICT user than women .Similarly, studies concerning teachers' gender and ICT use have rated female teachers' low due to their limited access to computer use, skill and interest .Evidently, male teachers used ICT more in their teaching and learning processes than their female counterparts (Kay, 2009). But other study revealed that gender variable was not a predictor of ICT integration into teaching and learning processes (Peralta & Losta, 2007). Egbert, Paulus and Nakamichi (2002) reported that, teachers gender affects the use of ICT in language teaching and learning while Teo, (2011) found that teachers' gender had no significant effect on ICT integration. Thus, the issue of gender and utilization of ICT is inconclusive.

Statement of the Problem

The 21st century ideas about knowledge and learning demand shifts from the traditional method of teaching to collaborative approach (Bandhana, 2012). Traditional educational environment do not seem to be suitable for science teachers in preparing learners to function or be productive in the work places of today's society .Onasanya, Sheu, Ogunlade and Adefuye (2011) reported that Studies have shown that science teachers' computer literacy level and ICT utilization resources were low. Hence, to achieve effective teaching and learning of science, there should be shift from traditional educational environment to technological advancement that has remain a hope of many decades to come.

The study therefore attempted to examine ICT self-efficacy of teachers in Nigerian secondary schools and to determine the extent to which teachers gender influences ICT self efficacy .The study raised one research question and one hypothesis each.

Research question One
• What is teachers' self-efficacy as regards the use of ICT for teaching? and tested the below

Hypothesis One
Ho: There is no significant difference between male and female science teachers in their Self- efficacy on ICT for teaching.

Methodology
The study was a descriptive research type using cross-sectional survey method. Descriptive method describes, finds out and interprets event(s) and idea(s) the way they are without any external manipulation. Descriptive method enables the researcher to describe the situation exactly as they appear. Survey was chosen for this study so as to collect large amount of information about the teachers' beliefs, values, and activities. The study used an adapted questionnaire in collecting data from the respondents.

The total population for this study comprised all the secondary school teachers in government-owned secondary schools in two selected states (Niger and Kogi State). 650 teachers were randomly selected across the state on which questionnaire were administered to out of which 575 were adequately filled and returned analyze the data for the study. Stratified random sampling technique was employed to group the respondents by gender. The instrument employed for this study was a questionnaire adapted online from the previous studies like Bandura, (1997); Cassidy and Eachus (2002) titled Assessment of secondary school teachers' self-efficacy and Gender Influence on the utilization of ICT (ASSTSGIUICT). Items were selected based upon these previous studies as related to Self-efficacy on integration of ICT for teaching.

The instrument consisted of two sections. A and B. Section A was based on Demographic data like the name of the school, gender, age, teaching experience, educational qualification. Section B was made up of 15 items on teachers' self-efficacy. This was to determine teacher's capability in the use of ICT resources for teaching. A 4-point Likert rating scale was employed; Strongly Agree (SA): 4, Agree(A) : 3, Disagree (D) : 2, Strongly Disagree (SD). The respondents were required to respond to items by ticking as applicable.

To ascertain the validity of the research instrument, questionnaire was administered to sample size of 150 teachers in kwara state that was not part of the sample. The reliability of the instrument for this study was carried out using test- re-test method to check the internal consistency of the instrument. The Cronbach's Alpha value yielded 0.83. These values were considered reliable and appropriate for the study. Copies of the questionnaire were administered personally with the help of Research Assistants. Also, the research assistants helped to retrieve some of the questionnaire that could not be completed immediately. In all, 650 copies of questionnaire were administered of which 570 were returned and used for data analysis in the study. Thus, given a 74.8% return rate.

The analysis and interpretation of data obtained through the questionnaire was subjected to both the descriptive and inferential statistics. Percentage was used for the demographic data of the respondents while mean was used to answer research questions 1 using a bench mark of 2.50 was acceptable and below 2.50 was rejected while the Hypothesis was tested using T-test at 0.05 levels of significance.

Results and Discussions
Research Question 1: What is the teachers' Self-efficacy as regards use of ICT for teaching?
The research question was raised to find teachers' Self-efficacy as regards use of ICT in instruction. The researcher analyzed the responses from the items on the questionnaire and the results are as shown in Table 1

Table 1:
Teachers' Self-efficacy as regards the use of ICT

S/N	Basic ICT Operation	Mean(x)	Decision
1.	Successively start the computer.	3.54	
2.	Easily save to a compact disc.	3.33	
3.	Easily switch from sentence case to upper case.	3.24	
4.	Easily operate basic keyboard operations.	3.34	
5.	Successfully print both from offline and online	3.18	
	Grand Mean	3.31	Accept
	Computer Software Application		
6.	Successfully type and edit lesson note in word packages e.g (MS- word).	3.38	
7.	Effectively use formula in spreadsheet for l result computation.	2.96	
8.	Effectively change font style and size while typing on word package e.g. MS-word.	3.24	
9.	Document information of my students using spreadsheet.	2.98	
10.	Save in different types of MS documents e.g. 97-2003.	3.14	
	Grand Mean	3.27	Accept
	Internet		

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11.	Type into tool address bar to surf the web for new instructional resources.	3.20
12.	Download useful scientific educational materials from the web for teaching my students.	3.39
13.	Access my e-mail for up-to-date information.	3.37
14.	Download important instructional videos for teaching/learning purposes.	3.43
15.	Send educational resources to my colleagues through e-mail	3.31
	Grand Mean	3.34 Accept
	Average Mean	3.31 Accept

The result in Table 1 reveals a grand mean of 3.31 was accepted for teachers self-efficacy as regards use of ICT on basic ICT operation, a grand mean of 3.27 was also accepted for science teachers Self-efficacy as regards use of ICT for computer software application and a grand mean score of 3.34 was accepted for teachers Self-efficacy as regards use of ICT based on internet use. This indicates that teachers' Self-efficacy as regards use of ICT for teaching is high with a grand mean of 3.31 which is greater than 2.50 is accepted for teachers' self-efficacy. It is clearly understood from table 1 that with the mean score of 3.5 teachers' Self-efficacy on basic computer operation is very high as they claimed they could successfully start the computer with ease. They also claimed they could easily save to a compact disc, easily switch from sentence case to upper; as well as easily operate some basic keyboard operations with mean scores of 3.33, 3.24, and 3.34, respectively. Meanwhile, print online and offline- pictures, drawing and diagrams had the lowest mean score of 3.18. Furthermore, teachers' computer software application self-efficacy, the average mean score of teachers' Self-efficacy on the use of ICT on table 1 was 3.27. This also translated to 81.75%. With this result, it is postulated that teachers' Self-efficacy on the use of ICT for teaching is highly positive.

Ho1: There is no significant difference between male and female science teachers on their Self-efficacy on ICT for teaching.

To find out whether significant difference exist between male and female teachers on their Self-efficacy on ICT for teaching, Independent sample t-test analysis was employed as shown in Table 2.

Table 2:
t-test of Male and Female Teachers' Self-Efficacy on ICT

Gender	No	X̄	SD	df	T	Sig.(2-tailed)
Male	325.00	49.92	7.50			
				1239.00	4.68	0.00
Female	250.00	47.56	9.10			

Table 2 reveals that t (1239) = 4.68, p <0.05. The significant value 0.00 on the table is lesser than the 0.05 alpha levels. This means that the null hypothesis was rejected. By implication, the stated null hypothesis was established that there was a significant difference between male and female teachers' Self-efficacy on the use of ICT for teaching. The mean score of male (49.92) teacher is greater than that of the female (47.56) teachers. This showed that the ICT Self-efficacy is in favour of the male teachers.

Conclusions

The current study has revealed the teachers' level and skill possessed in successful integration of ICT to the instruction in secondary schools. To live effectively in this technological age, some understanding of the basic concepts, principles and application of ICT has become inevitable for everyone. Thus, science teachers are enjoined to show more interest in the Integration of ICT to achieve effective learning outcome. Also, the female science teachers should not be Gender biased or technophobia so as to bridge Gender gap in the integration of ICT for instruction

Recommendations

In view of the enviable role of ICT in teaching and learning of science, it is recommended that:
1. Secondary school science teachers should develop more interest to maintain and improve their skills so as to find t h e ICT resources more easier to use for instruction
2. Government and policy makers in education should Endeavour to introduce the use of ICT into teacher education curriculum in secondary schools to be used by both teachers and students for instructional purposes.
3. Government and NGOs should organize conferences, trainings, and capacity building Workshops to educate science teachers on the benefits as well as up-date their knowledge on integrating ICT to teaching. This would enhance the teaching of abstract topics that are difficult to teach and comprehend by the students.
4. Further still, science teachers should help themselves and be encouraged by the school authority to make use of   I C T resources for instructional purposes .This will enable them to achieve the ICT usefulness, improve and maintain their ICT skills.
5. Female science teachers need to be more encouraged to integrate ICT to instruction so as to bridge the gender gap t h a t exists in the utilization of ICT for instruction.

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THE IMPACT OF TECHNOLOGY INTEGRATION ON SENIOR SECONDARY SCHOOL STUDENTS' PERFORMANCE IN BIOLOGY IN GOMBE STATE

Dr. ADEDOKUN-SHITTU Nafisat. A., MOHAMMED Al-amin & ABDU Danyaro

Abstract

The study investigated the impact of technology integration on senior secondary school students' performance in Biology in Gombe State. Quasi-experimental research design was adopted that employed pretest, posttest non randomized control group design and 80 SSI students were sampled from the four (4) arms of the Senior Secondary one (SS 1) students of the selected school. Biology Performance Test (BPT) was used to collect data for this study. The data obtained was analysed using descriptive statistics to answer the research questions while t-test was used to analyze the formulated hypothesis. The findings indicated that there is a significant increase in the performance of students taught with technology integration and those taught without technology integration. The findings also revealed that there was significant difference between mean score of students taught with technology integration and the score of those taught without technology integration. The study therefore recommended that students should be taught with technology integration. Equally Biology teachers should enhance effective use of technology integration in the teaching of Biology in senior secondary schools.

Keywords: Technology Integration, Students' Performance, Biology

Introduction

In the 21st century, technology has affected lifestyles in so many ways particularly when it comes to the issue of education. Technology integration is the incorporating of technological resources (audio and video animation) in teaching and learning. Technology integration is the use of software supported learning for lifelong applications so that students can learn to use computer flexibly, creatively and purposefully . This implies that technology integration is the use of appropriate technologies applied to facilitate and enhance learning. Similarly, Badia, Menesesa, Sigalesa and Fabregues (2014) affirmed that there are potential benefits of technology integration for teaching and learning in secondary schools that have been extensively characterized in the educational environment. The collective subject of these studies stressed the effectiveness of implementing technology to support and enhance students' performance (Thang & Murugaiah, 2016; Razavi, Ghanizadeh, & Akbari, 2016; Almekhlafi, Ismail, & Al-Mekhlafy, 2017).

A successful integration of technology in teaching and learning heavily depends on the views and willingness of teachers and students involved to improve teaching and learning (Almekhlafi, et al., 2017). Minausta (2016) suggested that the level of students' performance is higher in comparison with the level of teachers' usage of technology integration in the classroom. In the same vein, Kim and Hyo-Jeong (2009) asserted that technology integration plays a critical role in representing a certain subject matter to be more comprehensible and concrete, helping students correct their misconceptions on certain topics, providing cognitive and metacognitive supports, and ultimately improving students learning outcomes. Andrew, Mimi, Brooke, Jeffrey, and Heather, (2011) reported that participants in technology integration showed high improvements in their performance, experience, and knowledge after participating in their respective professional development enactments, display larger effect sizes on students' performance.

Students' performance is affected by the quality of teaching and learning resources. Mbaria (2012) noted that schools with adequate technological resources such as Internet facilities, ICT resources, and so on stand a better chance of performing well in examination than poorly equipped schools. The study further indicated that private schools students performed better than public schools students because of the availability, accessibility and adequacy of teaching and learning resources. Similarly, Ala (2014) revealed that there is positive significant relationship between technological resources and students' performance. Therefore, teaching and learning resources have an effect on students' performance. Onasanya (2002) stressed that 3-dimentional computer animation which is technology integration has a significant effect on students' performance.

Student outcomes during learning with technology is higher that during the traditional method of teaching. This shows that technology integration improve students' performance (Kiviniemi, 2014). The study further stated that technology integration approach is predominantly positive. Therefore, this indicated that there is significant positive feedback comments concerning the technology integration learning approach compared to traditional approach. Technology integration reduces drop-out rates and increases students' performance in exams (Lopez-Perez, Perez-Lopez, & Rodriguez-Ariza, 2011). Almekhlafi, Ismail, and Al-Mekhlafy (2017) revealed that integrating technology into teaching and learning of Biology increases opportunities for successful students' performance. Students have found technology to be motivating tools in their classes, particularly when it comes to teaching and learning of Biology (Badia, et al. 2014). Biology is among the three basic science subjects in Nigerian secondary school. It is the study of living and non-living things.

Biology is the interaction between living and non-living things and many other activities such as experimental and theoretical aspects by which human being tries to find solutions to everyday activities . Jones, Read, and Weyer, (2007) stressed that Biology as a science discipline is essentially a practical subject and therefore involves highly equipped laboratory and field skills. Federal Republic of Nigeria (2013) stated that the provision and use of available technological resources for teaching will lay a sound bases for scientific and reflective thinking among male and female students.

Gender is an important factor on enjoying using technological tools in learning environments. Research evidences have shown gender differences exist particularly when its come to learning through technology devices (Tijjani, 2015 and Ala, 2014). Wong and Hanafi (2007) suggested that no any significant differences between female and male student in their technology integrated usage. Similarly, Onwuagboke and Singh (2016) asserted that no significant differences in relation to male and female performance. Ochonogor (2011) proved that the female students performed much better than their male counterparts in Biology achievement performance. Study generalized that a slightly greater male scores than females exist in science, technology and mathematics.(Hyde & Linberg, 2008).

Statement of the Problem

Most students do become receptive, that is they easily learn what is concretely seen or touched. What is seen or touched become more permanent in their memories and can be easily recalled. Technology integration provides resources including innovative curricula, teacher-created lesson plans, assessment quizzes, as well as interactive tools such as video, audio, animation, visualizations and simulations that support teaching and learning activities. Technology integration such as instructional video which provides a good basis or avenue for meeting the needs of such categories of students is been neglected by most Biology teachers. It was observed that teaching of Biology depend on the conventional methods of teaching where the learner is to memorize facts. These teaching strategies are inadequate because as they are not interactive and facilitating meaningful learning.

Therefore, teaching of Biology should be practical, exploratory, and experimental method for students to acquire more skills that will improve their performance . The instructional strategies for teaching Biology are learner-centered. Teacher-centered approach should be shifted to students-centered that allow the students to interact with one another and where students learnt through technological integration. This study therefore, examined the impact of technology integration on senior secondary school students' performance in Biology in Gombe state.

Purposes of the study

The study was guided by the following purposes:
1. Determine the performance of secondary school students taught with technology integration and those taught without technology integration.
2. Determine the influence of technology integration on senior secondary school students' performance in Biology based on gender.

Research Questions

1.What is the performance of secondary school students taught with technology integration and those taught without technology integration.
2. What is the influence of technology integration on senior secondary school students' performance in Biology based on gender.

Hypothesis

Ho: There is no significant difference between the mean score of students who were exposed to technology integration in Biology and the score of students who were not exposed to technology integration in Biology.

Methodology

The study was a quasi-experimental research design that employed pretest, posttest, non-randomized control group design. The population of the study consisted of all Science Senior Secondary School Students in Gombe Metropolis, Gombe State. The sample of the study consisted of 120 respondents was selected using multistage sampling technique. The school used for the study was selected randomly by balloting out of the three (3) science secondary schools in Gombe metropolis. The sample respondents were randomly selected from the (4) arms of SS 2 of Government Science Secondary School (1) Gombe based on the criteria for their placements in their respective classes. The respondents were made up of 60 SS 2A students and 60 SS 2D students of Government Science Secondary School (1) Gombe, they were intact class respectively. The researcher assigned SSA students to be the experimental group while SS2D to be the control group.

An adopted instructional video from smartlearning.com that contains Biology lessons was exposure to experimental group. The instruments was validated by two lecturers in Biology Unit, School of Basic and Remedial Studies, Gombe State University, Gombe and one Biology teacher in selected school. All the necessary amendments were made.

The reliability of the test was estimated by test-retest on 20 Biology SSII Students in Government Science Secondary School (2) Gombe which was not part of the study sample. The reliability coefficient of 0.82 was obtained using Pearson Product Moment Correlation. The research questions were answered using means and standard deviations, while the hypothesis was tested at 0.05 level of significance using t-test.

Results

The results of the study are presented below:

Research Question 1: What is the performance of secondary school students taught with technology integration and those taught without technology integration.

Table 1:
Descriptive Statistics Showing Mean Performance of Respondents of experimental and control groups

Group	No.	Mean of Pre-test	Mean of Post-test	Mean gain
Experimental group	60	6.58	12.22	5.64
Control group	60	6.56	7.92	1.36
Mean Df		0.02	4.3	4.28

Table 1 reveals that respondents who were exposed to technology integration (instructional video) has mean score of 12.22 and those who were not exposed to instructional video has mean score of 7.92. This implies that technology integration (instructional video) enhances students' performance in Biology.

Research Question 2: What is the influence of technology integration on senior secondary school students' performance in Biology based on gender.

Table 2:
Descriptive Statistics Showing Mean Performance of male and female of the experimental group

Gender	No.	Mean	Standard Deviation
Male	34	6.92	1.53
Female	26	5.30	1.17
Mean Df		1.62	0.36

Table 2 reveals that mean scores of male students and female in table 2 were 6.92 and 5.30 respectively and standard deviation was 1.53 and 1.17 respectively. This indicates that male students performed better than the female when exposed to technology integration.

Hypothesis one: There is no significant difference between the performance of students who were exposed to technology integration in Biology and those were not exposed to technology integration in Biology.

Table 3:
Inferential statistics t-test analysis on Post-test result of the two Groups

Group	N	$\overline{X}$	SD	tcal	tcrit		df
Experimental	60	12.22	2.70				
				7.50*	1.96	0.05	118
Control	60	7.92	3.03				

* Significant at 0.05-α level

Table 3 result showed that the t-calculated = 7.20 and t-critical = 1.96 with degree of freedom = 118. Thus, the t-calculated is greater than the t-critical and P<0.05. Hence, null hypothesis was rejected and the alternative hypothesis is accepted. Therefore, there is a significant difference between the performance of students who exposed to technology integration in Biology and those who were not exposed to technology integration in Biology.

Discussion of the Findings

The findings of research question one revealed that those students taught with technology integration performed better than those taught without technology integration. This finding is in line with the work of Kiviniemi (2014) who found that student outcomes during learning with technology is higher that during the traditional method of teaching. It is also supported by Almekhlafi, et al. (2017) revealed that integrating technology into teaching and learning of Biology enhanced students' performance. Therefore, technology integration enhanced students' performance in Biology.

The result obtained in research question two revealed that male students performed better than the female when exposed to technology integration. This result agrees with previous work on the related issue, for instance Hyde and Linberg (2008) found male students performed than females in science, technology and mathematics . However, Research evidences have shown gender differences exist particularly when its come to learning through technology devices (Tijjani, 2015; and Ala, 2014). The result of the hypothesis showed that there was a significant difference between the performance of students who exposed to technology integration in Biology and those who were not exposed to technology integration in Biology. The result obtained agrees with previous works on the related issue, for instance Kiviniemi (2014) indicated that there is significant differences concerning the technology integration learning approach compared to traditional approach.

Recommendations

The data collected for this study have been analyzed and result interpreted and discussed, appropriate relevant recommendations made. These recommendations are as follows:

●Senior secondary school Biology teachers should employ the use of technology integration in teaching of Biology so as to improve students' performance.

●Parents should ensure and encourage the potentials of their children by adequate provision of technological resources to concretized their knowledge and skills gained.

●Schools should provide all necessary technological facilities and resources to ensure students are exposed to technology integration during Biology lesson.

●Other educational regulatory agencies should use these good opportunity and organise workshops, seminars, and enlightenments for Biology teachers on the good use of technology integration.

Conclusion

The findings and discussion of the study served as the basis for making the conclusion. Technology integration was found to be more effective on students' performance in Biology. This shows that students learn and perform better when they were taught with technology integration because the use of technology integration gives the students the opportunity to watch and listen to the instructional video before and during lesson period.

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EFFECTS OF COMPUTER-MEDIATED MULTIPLE INTELLIGENCE INSTRUCTIONAL METHOD ON STUDENTS' ACHIEVEMENT BASIC TECHNOLOGY IN LAGOS STATE, NIGERIA.

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Abstract
This study investigated effects of Computer-mediated Multiple Intelligence Instructional Method on students' Achievement Basic Technology in Lagos state, Nigeria. The study was a pretest, posttest, non-equivalent control group quasi-experiment which involved groups of students in their intact classes randomly assigned to experimental and control groups. Two research questions and two hypotheses, tested at 0.05 level of significance guided the study. The sample size was 112 Junior Secondary School II (JSS2) students from which 67 students constituted the experimental group taught using Computer-mediated Multiple Intelligence Instructional Method, and 45 students constituted the control group taught with Conventional Instructional Method. The instrument used for data collection was Basic Technology Achievement Test (BTAT). The data collected were analyzed using Mean to answer research question while ANCOVA statistics was used to test the two hypotheses. The study found that students taught Basic Technology using Computer-mediated Multiple Intelligence Instructional Method had a higher mean achievement score, than those taught with Conventional Instructional Method. The mean difference was found to be statistically significant. The study also found that there was no significant influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method in the achievement respectively. Hence, teachers of Basic Technology should structure the presentation of lessons in a manner that engages most or all of the intelligences of the students in the classroom.

Keyword: Instructional Method, Students Achievement, Computer Mediatiom, Multiple Intelligence

Introduction

Intelligence has traditionally been defined in terms of Intelligence Quotient (IQ), which measures a narrow range of verbal/linguistic and logical/mathematical abilities (Christison, 1996). In this context, intelligence is viewed as being a composite of different abilities or aptitudes (Doyle, 2011; Tiri & Nokelainen, 2008). In 1983, Howard Gardner, proposed a theory called Multiple Intelligences (MI), the theory states that human being possesses seven different intelligences that reflect different ways of interacting with the world. Gardner (1983) argues that humans possess a number of distinct intelligences that manifest themselves in different skills and abilities. The eight intelligences include: Verbal-Linguistic, Logical- Mathematical, Intrapersonal, Visual-Spatial, Musical-Rhythmic, Bodily-Kinesthetic, Interpersonal and Naturalist; are all used by individuals in varying degrees, but one intelligence may be particularly dominant. Gardner stated clearly that Multiple Intelligence is quite different from learning style; his theory merely describes a learning behaviour and should not be viewed or used as a learning style.

The theory of Multiple Intelligences in its design lends itself to the utilization of Instructional technologies in the modern, changing environment of education (Michael, 2009). Veneema & Gardner (2006) asserted that technology can enhance learning for all students by offering a more complex curriculum that addresses Multiple Intelligences. According to Nelson (1998) Computer Mediated Multiple Intelligence Instructional Method can enhance and address all the intelligence of the students and help the students maximize their learning. Dave (1999) equally found that students who took part in an online multimedia activity drawn upon all of the Multiple Intelligence; learned maximally and became experts in the topics.

Several research has shown that integrating Computer-Mediated Multiple Intelligence Instructional Method in the classroom can be used to individualize learning, enable students to take control of their learning and thereby making them constructors of knowledge rather than crammers of knowledge and at the same time assisting students to learn fully and maximize their capabilities and potential (Eya & Neboh, 1999; Inyiagu, 2005). Moreover, with the use of Computer-Mediated Multiple Intelligence Instructional Method, the objective which includes imbibing lifelong learning in the students will be met (Zane, 1995). A situation in which a teacher applies Computer to Multiple Intelligence Theory that specifically addresses and activates the eight intelligences as identified in Howard Gardner's theory of Multiple Intelligences is termed as Computer- Mediated Multiple Intelligence Instructional Method. To apply MI alongside with Computer Mediated Instruction in the classroom; teacher presents varieties of instructional techniques involving the use of jigsaw, puzzle, animation, wiki, blogs, simulation, audacity, collage items from nature, voice over and Microsoft word, in order to adequately cater for students' intelligence. And this can go a long way to stimulate students' interest towards learning Sciences and Technology subjects.

Basic Technology is one of the technology subjects offered at Junior Secondary School level, it is a phase of general education designed to introduce and acquaint the learners to the basic knowledge of technologies such as auto mechanics, applied electricity, building, ceramics, metalwork, woodwork, plastics, rubber, food preservation, storage, technical drawing (Federal Republic of Nigerian Policy of Education, 2004).

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The aim is that at the end of Junior Secondary School, technological appreciation would have been attained and solid foundation is likewise laid in the students' entrance into a vocation or choice of career at the Senior Secondary School. This is in accordance with the three main objectives as stated by the Federal Republic of Nigeria (Federal Republic of NPE, 2004).

It is dishearten to note that the objective of offering Basic technology at JSS level in Lagos state is gradually being defeated, looking at Basic technology examiner report gotten from Lagos state examination board shows the failure rate of students in Basic Technology in the year 2008, 2009, 2013, 2014, 2015 were 243 (6.55%); 716 (17.99%); (66) 1.39%; 1614 (2.16%); (1698) 23.33% respectively, it is alarming to note that the failure rate is increasing annually. Also reports from different states in Nigeria indicated poor performance of students in Junior Secondary School Examination in Basic Technology (Nwoji, 2000; Lenga, 2001). A study carried out by Ohuche (1989) revealed that the poor performance of students in Basic Technology exams is as a result of the lack of interest of students in the subject.

Additionally, in Nigeria, and perhaps the whole of Africa, gender bias is still very prevalent (Arigbabu & Mji, 2004). Bosede, (2010); Aremu, (1999), asserted that gender influence students' academic achievement in Science and Technology; boys outperform girls in science and technology subjects. Instructional method, instructional technology and environment are parts of the factors that contribute to gender inequality in Science and Technology learning Adepoju & Amoo, (2005); Adeleke & Amoo, (2007). However Arigbabu & Mji (2004) stated that there will be no differences in achievements of students in respect of gender if the appropriate instructional method is adopted. Erinosho (2008) also asserted that girls and boys are found to perform equally well if instructional method is interactive.

Students' achievement connotes performance in school subjects as symbolized by a mark or score on an achievement test. It is quantified by a measure of the student's academic standing in relation to those of other students of his peers. Over the past decades, educational research has focused on the question of what influences and affects the students' academic achievement. Igweh (2012) asserted that learning environment is an important facilitator of learning and that this can increase students' performance positively. Educational technologist on the other hand believed that for learning to occur, students must interact with their environment (Winn, Hoffman, Hollander, Osberg, Rose & Char, 1997). They also noted that interaction is a critical component to students' knowledge construction. Brewer (2003) similarly opined that computer-based technologies are powerful pedagogical tools that can turn the passive students into an active participant in the learning environment and in so doing, ameliorating their performance academically. It is therefore essential to apply computer based learning into the teaching of Basic Technology. Several findings have revealed that poor instructional methods adopted by Basic Technology teachers, has drastically affected students' performance in Basic Technology (Ogwa 2002; Ezenwa, 2003 Inyiagu, 2005; Elisha & Ugochukwu 2014). Also Kamaldeen (2012) study showed that Basic Technology Teachers' have the right attitude towards ICT but lack adequate information integration methodologies.

Presently, Lecture Instructional Method, predominantly used to teach Basic Technology at the Junior Secondary School are based on behavioural learning theory and emphasizes knowledge transmission from the teacher to passive students and encourages rote memorization (Boyle, Duffy & Dunleavy, 2003). Besides, the method emphasizes, verbal-linguistic intelligence, obviously, students who are not endowed with such abilities would find it difficult to learn and thereby become repulsive to learning. Additionally, the method does not equip teachers with an adequate knowledge of human intellect which they are expected to develop (Campbell & Campbell, 1999). Consequently, lecture method used by most teachers, do not adequately address the diverse intelligences of the students they teach. This situation may have been responsible for some students' inability to pass Basic Technology in the Junior Certificate Examination in Lagos State. According to Edwards (1995) a key to effectiveness of Educational Technology is based on teachers taking cognizance of students' strengths and weaknesses. Perhaps if Computer-mediated Multiple Intelligence Instructional Method is applied to teach Basic Technology students achievement will improve.

Research Questions
The following research questions were posed to guide the study:
1. What is the comparative mean achievement score of students taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method and those taught with Conventional Instructional Method?
2. What is the influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method?

Hypotheses
The following null hypothesis tested at .05 level of significance guided this study:

H_{O1}: There is no significant difference between the mean achievement scores of students taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method and those taught with Conventional Instructional Method.
H_{O2}: There is no significant influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method.

Theoretical Framework
In 1983, Howard Gardner, proposed a theory called Multiple Intelligences (MI), the theory states that human being possesses seven different intelligences that reflect different ways of interacting with the world. Gardner (1983) argues that humans possess a number of distinct intelligences that manifest themselves in different skills and abilities. The eight intelligences include: Verbal-Linguistic, Logical- Mathematical, Intrapersonal, Visual-Spatial, Musical-Rhythmic, Bodily-Kinesthetic, Interpersonal and Naturalist; are all used by individuals in varying degrees, but one intelligence may be particularly dominant. Gardner stated clearly that Multiple Intelligence is quite different from learning style; his theory merely describes a learning behaviour and should not be viewed or used as a learning style.

Verbal/Linguistic intelligence is the ability to effectively use language learning in terms of writing and speaking (Smora, 2003). Those individuals with this intelligent strength like reading; they can be taught by reading. While Logical/ Mathematical intelligence is the ability to effectively use numbers and build logical relationships (Patterson, 2002). Individuals who like analyzing problem carefully before systematically testing solutions exhibit Logical/Mathematical intelligence. Visual/Spatial intelligence is the ability to think with pictures and to graphically represent visual and spatial ideas (Sjolinder, 1998). Also, humans who are responsive to colours and patterns in their environment, like to make interesting designs as such; their intelligence strength is Visual/Spatial (Gardner, 2006). They like learning with drawing. However, humans that have Musical/Rhythmic intelligence are always very sensitive to sounds in the environment and like creating music (Chan, 2000). They can be taught by turning lessons into lyric. More so, Bodily/Kinesthetic intelligence is the ability to use the body to express oneself and solve problems with movements and gestures (Gardner, 2006). Those whose intelligent strengths are Bodily/Kinesthetic use their bodies to learn. They communicate well through body language. Those who possess interpersonal intelligence learn through person-to-person interaction and love team activities of all kinds. They can be taught through group activities. Intrapersonal intelligence, according to Gardner, is the most important intelligence type of daily life, which enables individual to have knowledge and understanding about oneself (Christison & Kenedy, 1999). Those who possess this intelligence are often self-reflective. They can be taught through independent study. While naturalistic intelligence is the ability to recognize and classify plants, minerals, and animals (Chen, 2005). The naturalists are the people that like to collect items from nature, study them, and group them. They can be taught using nature (Armstrong, 2007)

Literature Review
The theory of MI suggests a major transformation in the way teachers design learning environments for their students, depending on their intelligence, skills and abilities. Such intelligences constitute a multitude of ways in which individuals take in information, record and manipulate information (Veenema & Gardner, 1996). The implication is that for teachers to apply MI in the classroom, instruction must be designed, developed and delivered in a wide variety of ways in order to facilitate effective learning for diverse intelligence of students they teach, thus providing them with ample opportunities to develop and utilize their various skills and abilities (Armstrong, 1994). Several studies have revealed the effectiveness of MI in the classroom, the study carried out by Zehra (2010) revealed that the Multiple Intelligences Instructional Method affect the sixth grade students' achievement level in science related subjects. More over Ali, Soosan & Hamze (2013) found that students who were taught with Multiple Intelligence Instructional Method achieved higher mean score than the ones who were taught with Conventional Instructional Method in science courses. The study carried out by Nalan & Husamettin (2011) also revealed that Multiple Intelligence Instructional Method has a positive influence on students' achievement and also positively affected students' attitude towards chemistry learning. Moreover, Willis & Johnson (2001) found that implementing MI theory in the classroom ameliorates students' interest and creativity in mathematics. Furthermore, teaching through intelligences has been found to increase interest and achievement in classroom assessment (Campbell & Campbell, 1999; Greenhawk, 1997; Kornhaber, Fierros, & Veenema, 2004)

A study by McKenzie (2002) revealed that Computer-Mediated Multiple Intelligence Instructional Method helped learners to succeed and that it could play important roles to enliven current lesson plans and build a repertoire of the teaching methods. A paper presented by Katya Arpon (2009), x-rayed the positive effect of Integrating M.I & Technology; one of which is that students find topics more interesting when information is presented in a variety of ways, and feel more motivated when they know that their intelligence strength will be addressed. A study carried out by Zang & Kung (2004) reported that students in the experimental group taught chemical equilibrium with web based Multiple Intelligence based teaching outperformed the control group. Also, Ranade (2004) found that there was a significant increase in achievement in the post-test than in pre-test of student-teachers who were taught planning Science lessons through multimedia and Multiple Intelligence.

Similarly, Tapkeer (2006) study revealed that students taught through Multimedia and Multiple Intelligence reacted very positively to the learning experience and scored better too. The results reiterated from Saraswathy, Clamentine & Maran (2012) study showed that the use of Multimedia and Multiple Intelligences in the English for Specific Purpose (ESP) classroom is far more effective as they register higher mean scores in performance and interest as compared to the regular teaching style. The study of Mohd & Siti (2015) found a statistically significant difference between the performances of experimental and control groups taught Adobe Photoshop CS3 in favour of the students in the experimental group.

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Methodology

Design and Area of the Study

A Quasi-experimental research design was adopted for this study. The non-equivalent pretest post-test control group design was used. This study was carried out in Lagos state Secondary Schools offering Basic Technology as one of the subjects at Junior Secondary School Certificate Examination (JSSCE) level.

Sample and Sampling Techniques

The sample size was 112 students. The nature of this study requires that the research sample should be selected purposively, because this study must be conducted in a well-equipped Basic Technology laboratory. Hence, four Junior Secondary schools were purposively sampled for this study. Four intact classes from four Junior Secondary Schools were randomly assigned to experimental and control groups. In all, intact class with 67 students constituted the experimental group taught with Computer-Mediated Multiple Intelligence Instructional Methods while intact class with 45 students constituted the control group taught with Conventional Instructional Method.

Research Instruments, Validation and Reliability

The instruments used for data collection were Free Multiple Intelligence Test and Basic Technology Achievement Test (BTAT)

Free Multiple Intelligence Test

The Microsoft Excel type of the free Multiple Intelligence Test developed by Chislett & Champman (2005) obtained from www.businessballs.com was adopted for the study. The test was based on Howard Gardner's Multiple Intelligence Theory. It was used to determine students' strengths in each of the eight Multiple Intelligences identified by Howard Gardner.

Basic Technology Achievement Test (BTAT)

The BTAT was developed by the researcher. A test blue print was used to construct the BTAT items in order to ensure content validity of the test. The items of BTAT was drawn in line with following six major classes of cognitive domain of Bloom's taxonomy of educational objectives: knowledge, comprehension, application, analysis, synthesis and evaluation. Sixty-seven (67) multiple choice items were drawn from the following topics: ceramics, rubber, plastic, wood, lines, angles, triangles, circle, quadrilateral, Bisection, ICT, working principle of GSM network, and first Aid. In addition, the BTAT was subjected to face validation by three experts after which a trial test was conducted on the BTAT for the purpose of determining the psychometric indices of the test. 52 items of the BTAT had good difficulty, discrimination and distractor indices. The coefficient of stability of the BTAT was carried out using test-re-test reliability technique. The reliability coefficient of the BTAT was found to be 0.72 using Pearson Product moment correlation coefficient.

Data Analysis and Discussion

Research Question 1

What is the comparative mean achievement score of students taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method and Conventional Instructional Method?

Table 2

Mean of Pre - test and Post - test Scores of Experimental and Control Groups in the Achievement.

Group	N	Pretest	SD	Post-test	SD	Mean Gain
Experimental	67	15.98	4.42	31.67	5.16	15.69
Control	45	13.29	4.37	15.71	5.67	2.42

The data presented in Table 2 shows that the experimental group had a pre-test, post-test mean gain of 15.69. The control group had a pre-test, post-test mean gain of 2.42. With this result, the students in the experimental group performed better in the achievement test than the students in the control group. The result shows that Computer-mediated Multiple Intelligence Instructional Method is more effective than the Conventional Instructional Method in teaching Basic Technology students.

Hypothesis

H_{o1}: There is no significant difference between the mean achievement score of students taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method and those taught with Conventional Instructional Method.

Table 3

Summary of Analysis of Covariance (ANCOVA) for Test of Significance of Effect of Treatment on Students' Achievement in Basic Technology.

Source	Sum of Squares	Df	Mean Square	F	Sig.
Correlated Model	6900.690a	2	3450.345	120.125	.000
Intercept	2419.409	1	2419.409	84.233	.000
Pretest	43.220	1	43.220	1.505	.223
Treatment	5981.914	1	5981.914	208.263*	.000
Error	3130.801	109	28.723		
Total	81489.000	112			
Corrected Total	10031.491	111			

An Analysis of Covariance (ANCOVA) was used to test HO1. Results of the ANCOVA revealed a statistically significant effect of treatment, (F = 208.263, ρ < .05), as shown in Table 3.

The null-hypothesis HO1 is therefore rejected at .05 level of significant. With this result, the difference between the mean gain of experimental and control group was statistically significant in favour of experimental group.

Research Question 2

What is the influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method?

Table 4

Mean of Pre - test and Post - test Scores of Male and Female Taught Basic Technology with Computer - mediated Multiple Intelligence Instructional Method in the Achievement.

Group	N	Pretest	SD	Post-test	SD	Mean Gain
Male	34	15.41	4.85	30.62	5.78	15.21
Female	33	16.58	3.91	32.76	4.26	16.18

The data presented in Table 4 shows that the male taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method had a pre - test, post - test mean gain of 15.21, while the female taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method had a pre - test, post - test mean gain of 16.18. With this result, the mean achievement score of female taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method was higher than the mean achievement score of male taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method in the achievement.

H_{o2}: There is no significant influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method.

ANCOVA was used to determine if the difference in mean gains of the achievement of male and female students taught with Computer-mediated Multiple Intelligence Instructional Method was statistically significant.

Table 5

Summary of Analysis of Covariance (ANCOVA) for Test of Significance of Influence of Treatment on Gender Achievement in Basic Technology.

Source	Sum of Squares	Df	Mean Square	F	Sig.
Correlated Model	103.702a	2	3450.345	120.125	.000
Intercept	3907.544	1	2419.409	84.233	.000
Pretest	27.016	1	43.220	1.505	.223
Gender	63.841	1	63.841	2.466*	.121
Error	1657.074	64	25.892		
Total	68968.000	67			
Corrected Total	1760.776	66			

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Table 5 shows that the difference in the mean achievement scores of the male and female students taught with Computer-mediated Multiple Intelligence Instructional Method was not statistically significant, (F = 2.466, ρ > .05). The null hypothesis was therefore accepted at .05 level of significant. With the above result, there was no significant influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method.

Discussion

The data presented in Table 2 provided answer to research question one. Finding revealed that students taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method had a higher mean achievement score than those students taught with Conventional Instructional Method. In the same vein, Analysis of Covariance was used to test the first hypotheses, Table 3, at the calculated F-value (208.263), significance of F (.000) and significance level of .05. There was a statistically significant difference between the mean achievement scores of the group taught with Computer-mediated Multiple Intelligence Instructional Method and those taught with Conventional Instructional Method. The implication of this finding therefore is that Computer-mediated Multiple Intelligence Instructional Method is more effective than Conventional Instructional Method in enhancing students' achievement in Basic Technology. This finding is similar to the findings of Zang & Kung (2004) in chemical equilibrium, Saraswathy, Clamentine & Maran (2012) in English for Specific Purpose, Mohd & Siti (2015) in Adobe Photoshop CS3 learning, who in their various studies found that students taught with Computer-mediated Multiple Intelligence Instructional Method performed significantly better than those taught with Conventional Instructional Method. It is also in consonance with the study of Ranade (2004) that found that there was a significant increase in achievement in the post-test than in pre-test of student-teachers who were taught planning Science lessons through multimedia and Multiple Intelligence; similarly, Tapkeer, (2006) study which revealed that students taught through Multimedia and Multiple Intelligence reacted very positively to the learning experience and scored better.

The data presented in Table 4 provided answer to research question two; finding revealed that the achievement test of the female students taught Basic Technology with Computer-mediated Multiple Intelligence Instructional Method had a higher mean achievement score than the male students. Analysis of Covariance was used to test the hypothesis, Table 5, at the calculated F-value (2.466), significance of F (.121) and confidence level of .05 there was no significant influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method. This study is in-line with the study of Erinosho (2008); Arigbabu & Mji (2004) that both asserted that there will be no differences in achievements of students in respect to gender if the appropriate instructional method is adopted. This finding is contrary to that of (Arigbabu & Mji, 2004; Bosede, 2010; Aremu, 1999), which in their various study asserted that gender influence students' academic achievement in Science and Technology; male outperform female in science and technology subjects. This implies that if Computer-mediated Multiple Intelligence Instructional Method is adopted in the classroom, there will be no differences in the achievement.

Conclusions and Recommendation

The results of this study into the effects of Computer Mediated Multiple Intelligence Instructional Method on students' achievement of Basic Technology have provided support for the use of the method of teaching. The study found that students taught Basic Technology using Computer Mediated Multiple Intelligence Instructional Method had a higher mean score, than those taught with Conventional Teaching Method. Also, there was no significant influence of Gender on the achievement of students taught with Computer-mediated Multiple Intelligence Instructional Method. These findings imply that teachers should think of all intelligences as equally important during teaching and learning of Basic Technology; and teach to a broader range of talents and skills.

Additionally, teachers of Basic Technology should structure the presentation of lessons in a manner that engages most of all of the intelligences of the students in the classroom. Presentation of lessons in such a way that it will not only excite students about learning of Basic Technology but it will allow the teacher to reinforce the teaching and learning of Basic Technology in a variety of ways in the Junior Secondary School in Lagos State.

Implications of Findings

The findings of this research implies that teachers will know that all students are not the same; and they can perform better if taught with Computer-mediated Multiple Intelligence Instructional Method rather than using Conventional Instructional Method. Also Ministry of Education will see the need to provide computers in Junior Secondary Schools and sensitize them to organize conferences, workshops and seminars to train Basic Technology teachers on the use of Computer-mediated Multiple Intelligence Instructional Method.

This also implies that curriculum developers and planners will see the need to incorporate the use of Computer-mediated Multiple Intelligence Instructional Method to aid the teaching and learning process. This implies that teachers will see that if they design, develop and deliver their lessons in a wide variety of ways in order to facilitate effective learning for diverse intelligence of students they teach; there will be no gender inequality in their achievement. Students will know that their gender does not affect their performance in Basic Technology if they are taught with Computer-mediated Multiple Intelligence Instructional Method. Ministry of Education will see that the issue of gender inequality in Basic Technology can be resolved if teachers are trained on how to implement Computer-mediated Multiple Intelligence Instructional Method in the classroom.

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MATHEMATICS TEACHERS' READINESS AND USE OF MULTICHIOCE RESOURCE CENTRE FOR TEACHING IN OGUN STATE

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Abstract

Information and Communication Technology is an innovation which is capable of transforming or bringing about drastic changes in Nigerian educational system as it serves as the basic determinant of the future of teachers. The Multi-choice Resource Centre is targeted at improving the teaching and learning processes by equipping schools with audio-visual educational equipment through which the Multi-choice Education Bouquet can be accessed. The major problem faced by most students is inability to remember what they have learnt. This problem is often caused by too much theoretical expressions or formulae by the mathematics teachers while learners remain passive listeners. The use of technology will help reduce failure in Mathematics but the readiness and usefulness of the technological tools made available at the Multi-choice Resource Centre will go a long way to sustain the success rate of students in Mathematics. The study was a descriptive of a cross sectional survey. Mathematics teachers from 20 schools provided with the multi-choice resource centre in Ogun State. The sampling technique used was a convenient sampling to select 35 Mathematics teachers from the schools in Ogun state that have access to the Multi-choice resource centre. The study found out that out of all the technological resources listed in the study by the researchers for teaching Mathematics to students, 12 of them were available in schools. The study recommended that training should be organized for teachers to encourage and motivate them to use the technological tools since they perceived it useful.

Introduction

Information and Communication Technology is an innovation which is capable of transforming or bringing about drastic changes in Nigerian educational system as it serves as the basic determinant of the future of teachers. The National Policy on Education (FRN, 2013) recognizes the prominent role of Information Technology (IT) in knowledge and skills necessary for effective functioning in a knowledge driven world and recommend that the government shall provide adequate infrastructure and develop capacity for effective use of IT to enhance delivery of Education in Nigeria. One of the educational resources to be provided by government   the educational resources centre. Innovations in the educational resource centres comes along with IT as the use of IT is on the rise in the teaching and learning process in Nigeria. Some of the technologies which serve as instructional media have specific characteristics, such as openness, real-life connection, focus and come with the promise of radically transforming teaching and learning in education to a new dawn (Johnson, 2012).

According to Boris, Michael, Leigh and Peter (2011), new technology offers significant potential for enhancing the learning and teaching of mathematics at all levels. There is substantial evidence that, in the right hands and used appropriately for specific purposes in specific contexts, ICT can be an effective tool in supporting teaching and learning in Nigeria. ICT is an innovation which is capable of bringing about drastic changes in our educational system which serves as the basic determinant of teaching and learning. Yusuf et. al (2012) noted that 2004 was not the first attempt the Nigerian government made to introduce computer education in schools but it started in 1988 when the Nigerian government enacted a policy on computer education. The plan was to establish pilot schools and diffuse computer education innovation first to all secondary schools, and then to primary schools but the project did not really take off beyond the distribution and installation of personal computers but the Multi-choice Resource Centre.

The Multi-choice Resource Centre is targeted at improving the teaching and learning processes by equipping schools with audio-visual educational equipment through which the Multi-choice Education Bouquet can be accessed by the schools. Having realised the potentials of television in enhancing teaching and learning dynamics, Multi-Choice Nigeria, in partnership with School Net Nigeria, has developed a dedicated Education Bouquet to equip schools under a special initiative (premium times Nigeria, 2015). Under the digital satellite platform, schools have free access to the DSTV education bouquet, comprising six premium channels: National Geographic, Discovery Channel, History Channel, Animal Planet, BBC world and Mindset Learn. It would afford teachers and students the opportunity to have access to world class education, direct from their classrooms thereby bridging the digital divide between Nigeria and other developed countries (premium times Nigeria, 2015). One of the channels also teaches Mathematics which is a core subject in at every level of education in Nigeria (primary education to secondary education) (FRN, 2014).

Mathematics as a subject can be seen in all facets of life and in day-to-day occupations such as internet technology, banking, construction, medicine, scientific discoveries and even in our planning of daily activities and many others. Mathematics remains a core subject in both the primary and secondary schools (FRN, 2014). One of the reasons for the review of the (National Policy on Education, 1998) was to expand the National Mathematical Centre (NMC) whose role is to enhance Mathematics teaching and learning through research (FRN, 2014). In the National Policy on Education, Mathematics is one of the compulsory subjects in the basic education curriculum. Mathematics has continued to play significant role in Nigeria's national development. It is believed that among other things that there is no other subject that has greater application than Mathematics (Odogwu, 2002). Fields of knowledge are dependent on Mathematics for solving problem, stating theories and predicting outcome through mathematical theories (Odili, 2006). There is hardly any aspect of human lives that is not affected by Mathematics (Keith, 2000). Mathematics is the science of space and numbers. The study of space is called Geometry; the study of numbers is called Arithmetic, while the hybrid of geometry and Arithmetic is called Algebra. Mathematics therefore, can be said to be the bedrock of technology. For proper understanding of science, Mathematics play a major role, hence referred to as the queen of all sciences (Odili, 2006).

In spite of the importance attached to Mathematics as a core subject in Nigerian schools today and its application in everyday life, there has been consistent poor performance at all levels starting from the primary school level (Akinoso, 2015, Gambari & Adegbenro, 2008; WAEC May/June & Nov/Dec., 2007-2011). The phobia for Mathematics starts from the primary school education which is also known as the Lower Basic Education. The West African Examinations Council (WAEC, 2009, 2010, & 2011) Chief Examiners reports highlighted areas of students' weaknesses to include (i) inability to carry out simplifications of surds and indices, (ii) applications of laws of logarithm, (iii) inability in choosing appropriate scales in plotting graphs (iv) poor knowledge on the rubrics of construction, and (v) confusion on plane and solid shapes. Despite the importance attached to Mathematics and its crucial role in technology, student sees it as a difficult subject, as an abstruse and pointless subject to study (Akinoso, 2015), in this case, students show little or no interest in the subject. The major problem faced by most students is inability to remember what they have learnt. This problem is often caused by too much theoretical expressions or formulae by the Mathematics teachers while learners remain passive listeners (Odili, 2006). Though the use of technology will help reduce failure in Mathematics but the readiness and usefulness of the technological tools made available at the Multi-choice Resource Centre will go a long way to sustain the success rate of students in Mathematics.

Research Questions
1. What are the facilities and tools available at the Multi-choice resource centres?
2. What is the level of readiness of Mathematics teachers to the use of Multi-choice resource centres?
3. How do Mathematics teachers perceived the usefulness of the Multi-choice resource centres?

Literature Review
Multi-Choice Resource Centre in Nigeria

According to Arogundade (2016) Multi-Choice Nigeria showed their commitment to the educational sector again by enhancing education in Nigeria with its resource center intervention through the donation of digital learning aids to 22 schools in Ogun State. The 22 beneficiary schools are Abeokuta Girls' Grammar School, Abeokuta; African Church Grammar School, Abeokuta (Jnr.); Adeola Odutola College, Ijebu-Ode; Ansarudeen Comprehensive College, Ota; Baptist Boys' High School, Abeokuta; Makun High School, Sagamu; Odogbolu Grammar School, Odogbolu; Owode High School, Egba Owode; Our Lady of Apostles, Ijebu Ode; and Yewa College Ilaro. Others include Multilateral Grammar School(Jnr), Okun Owa; Ikenne Community High School(Snr), Ikenne; Ijebu-Ode Grammar School(Jnr), Ijebu-Ode; Community Grammar School, Owu-Ikija(Snr); Oronna High School(Snr), Ilaro; N.U.D Grammar School(Jnr), Solu; Government Science and Technical College, Igbesa; Comprehensive High School, Ayetoro(Snr); Asero High School, Asero(Snr), Asero; Agunbiade Victory High School(Snr), Magbon; St. Peter's College, Abeokuta and St. Peter's Catholic Private College, Abeokuta. Arogundade further stated that the digital resources in the Multi-choice Resource centres are introduced to improve the knowledge levels and understanding of subject areas by students (http://thenewsnigeria.com.ng/2016/02/multichoice-donates-22-digital-resource-centres-to-ogun-state).

Under the digital satellite platform, schools have free access to the DSTV education bouquet, comprising six premium channels: National Geographic, Discovery Channel, History Channel, Animal Planet, BBC world and Mindset Learn. It would afford teachers and their students the opportunity to have access to world class education, direct from their classrooms thereby bridging the digital divide between Nigeria and other developed countries (premium times Nigeria, 2015). One of the channels also teaches mathematics which is a core subject in at every level of education in Nigeria (primary education to secondary education) (FRN, 2014) (NERDC, 2014). Mathematics as a subject can be seen in all facets of life and in day-to-day occupations such as internet technology, banking, construction, medicine, scientific discoveries and even in our planning of daily activities and many others.

Mathematics remains a core subject in both the primary and secondary schools (FRN, 2014). One of the reasons for the review of the (National Policy on Education, 1998) was to expand the National Mathematical Centre (NMC) whose role is to enhance Mathematics teaching and learning through research (FRN, 2013). In the National Policy on Education, Mathematics is one of the compulsory subjects in the basic education curriculum.

Methodology

This is a descriptive research of the cross sectional survey type. The population for this study are Mathematics teachers from the 20 schools that are provided with the multi-choice resource centre in Ogun State. The sampling technique used was a convenient sampling to select 35 Mathematics teachers from the schools in Ogun state that have access to the Multi-choice resource centre. However, the study is specifically focused on the readiness and usefulness of Mathematics teachers towards the use of the multi-choice resource centre for teaching. A research designed questionnaire was used to determine the readiness and usefulness of technological tools at the centre by the teachers. The internal consistency reliability of the instruments was 0.81 and 0.82 respectively using Cronbach Alpha. Data was analysed using Percentage and Mean using a bench mark of 50% for percentage and 2.50 for mean.

Result

Q1: What are the facilities and tools available at the Multi-choice resource centres?

Table 1:
Availability of Technological Tools at the Multi -Choice Resource Centre

S/N		Availablility (%)	Decision
1	Computer	92.3	Available
2	Video Recorder	34.6	Not Available
3	Speaker	73.1	Available
4	Projector	84.6	Available
5	Interactive White Board	96.2	Available
6	Television Set	88.5	Available
7	DSTV Explora Decoder	88.5	Available
8	Power Generating Set	92.3	Available
9	Satellite Dish	88.5	Available
10	Uninterrupted Power System (UPS)	65.4	Available
11	Audio Cassette	76.9	Available
12	Video Cassette	69.2	Available
13	Radio	73.1	Available

Table 1 shows that availability of computers had 92.3%, video Recorder had 34.6% availability, Speaker had 73.1%, projector had 84.6, Interactive White Board had 96.2%,Television Set, Satellite Dish and DSTV Explora Set had 88.5% availability respectively, Power Generating Set had 92.3%, UPS had 65.4%, Audio and Video Cassette had 76.9% and 69.2% availability respectively and Radio had 73.1%. This implies that all the technological tools proposed by Multi-Choice are in place except for the Video recorder which is below 50%.

Q2: What is the level of readiness of Mathematics teachers to the use of Multi -choice resource centres?

Table 2:
Mathematics Teachers Readiness to the Use of technological Tools at the Multi Choice Resource Centre

S/N	Statements	Mean	Decision
1	Based on my profession, I am ready to use Multi-Choice Resource Centre for teaching	2.56	Agree
2	I plan on using the Multi-Choice Resource Centre for discovery on a regular basis to develop my teaching.	3.46	Agree
3	It will take me time before I can think of using Multi-Choice Resource Centre for teaching my class	2.62	Agree
4	I will rather not teach than to use Multi-Choice Resource Centre for teaching	1.88	Disagree
5	The use of Multi-Choice Resource Centre for teaching bring noise to the class, therefore I will not use it	1.65	Disagree
	Average Mean	2.43	Disagree

Table 2 revealed that Mathematics Teachers profession makes them ready to use Multi-Choice Resource Centre for teaching with a mean of 2.56, the use of the Multi-Choice Resource Centre for discovery on a regular basis help them to develop teaching with a mean of 3.46. More so, it takes time before most Mathematics Teachers think of using Multi-Choice Resource Centre for teaching had a mean score of 2.62, Mathematics Teachers will rather not teach than to use Multi-Choice Resource Centre for teaching had a mean score of 1.88 and The use of Multi-Choice Resource Centre for teaching bring noise to the class, therefore I will not use it with a mean score of 1.65. With the average mean of 2.43 which is lesser than 2.50, it implies that most Mathematics teachers are not ready to use the Multi Choice Resource Centres despite the availability of the technological resources in their schools.

Q3:How do Mathematics teachers perceived the usefulness of the Multi-choice resource centres?

Table 3:
Mathematics Teachers Perceived Usefulness of technological Tools at the Multi Choice Resource Centre

S/N	Statements	Mean	Decision
1	Using Multi-Choice Resource Centre for my class enables me to accomplish objectives more quickly.	3.23	Agree
2	Multi-Choice Resource Centre improves my students' academic performance.	3.12	Agree
3	I find Multi-Choice Resource Centre useful for my class.	3.23	Agree
4	Multi-Choice Resource Centre has given me greater awareness of its use.	3.13	Agree
5	Multi-Choice Resource Centre gives me more confidence using ICT tools for teaching.	3.17	Agree
	Average Mean	3.18	Agree

Table 3 revealed that Mathematics teachers perceived using Multi-Choice resource Centre for classes enables them to accomplish objectives more quickly with a mean score of 3.23, Multi-Choice Resource Centre improves my students' academic performance with a mean score of 3.12, Mathematics teachers find Multi-Choice Resource Centre useful for my class with a mean score of 3.23, Multi-Choice Resource Centre has given me greater awareness of its use had a mean score of 3.13 and Multi-Choice Resource Centre gives Mathematics teachers more confidence using ICT tools for teaching had a mean score of 3.17. With an average mean of 3.18, it implies that mathematics teachers perceived the Multi-Choice Resource Centre to be useful.

Discussion and Conclusion
The findings of the study is in line with findings of Nwosu (2010) who reported that teachers can, to a very low extent, utilize resources for their professional development to enhance service delivery in schools. It also revealed that slow access to equipment, low interest connectivity, lack of sufficient computers and high cost of purchase, lack of qualified personnel, interrupted power supply among others constitute a hindrance to usage of the available resources. More so, the findings of this study agreed with the report of Enwereuzor (2011) in a study on utilization of antenatal care facilities. This study is in consonance with the findings of Daudu (2012) in a study on assessment of availability and use of resources and services. Daudu reported that resources of the library were quite adequate. Materials resources are not very current except for newspapers. In line with the above findings, Gbosi (2003) indicated that the provision of these resources should therefore be matched with optimum utility in order to ensure effective implementation of by school management.
Based on the Finding, it was observed by that the technological resources are available at the Multi Choice Resource Centres in the selected schools in Ogun State. This suggests that the readiness of Mathematics teachers in using the available technological resources may be equivocal. It then becomes necessary to the availability and use of the technological resources for effective teaching of Mathematics to students in schools. The study found out that out of all the technological resources listed in the study by the researchers for teaching Mathematics to students, 12 of them were available in schools. Though Mathematics teachers are not ready to make use of the technological resources at the Multi-Choice resource centres but they perceived it to be useful for effective teaching of Mathematics. The study recommended that training should be organized for teachers to encourage and motivate them to use the technological tools since they perceived it useful.

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EVALUATION OF UBIQUITOUS COLLABORATIVE MOBILE LEARNING (UCML) MODEL: A FLEXIBLE INSTRUCTIONAL DESIGN PRINCIPLE FOR MOBILE INSTRUCTIONAL CONTENT DELIVERY

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Abstract

The world of instructional delivery is experiencing transformation driven by the pervasiveness of mobile device and wireless communication technologies. The soul mate of responsive design considers scenario for instructional content with regard to the configuration and operation-ability of the adopted technological devices. The world of mobile technologies and wireless computing is presenting a challenge to fully explore the mobile internet and enhance it as a learning tool. This study was a designed-based of quasi-experimental design that set out to evolve a ubiquitous collaborative mobile learning (UCML) instructional design model. It involves the synergy of three different models to constitute a whole. Experimental validation was conducted by experts (16) and students (18). Purposive sampling technique was adopted for sample selection and researcher-designed questionnaire was used to sample all respondents. Three research questions were raised and answered using mean and standard deviation. The Cronbach's Alpha validity result for experts gave 0.96 while that of the target audience gave 0.72. The result showed that the UCML instructional design model addressed the issues of interactivity, screen interface and feedback mechanism in a collaborative approach to online instructional delivery through mobile learning platform on the principle of bring your device (BYOD). Therefore, it was concluded that the UCML design model was appropriately evolved based on the instructional design principle.

Keyword: Ubiquitous, Mobile Learning, Collaboration, Instructional Design, Instructional Design Model.

Introduction

Alsadi and AbuShawar (2009) stated that mobile devices enable educators to deliver materials to students based on their needs and preferences. Mobile devices used for education purpose via wireless communication can provide opportunity to transmit instructions in a learning environment where teachers and student are separated by time or space or both, wherein the teacher provides course content through course management applications, multimedia resources, the internet, videoconferencing and so on. According to Evans (2009), mobile learning builds on the advantages offered by electronic learning by allowing learners to learn when and where they choose, and expanding those advantages to a mobile platform user who carries it with them for learning on-the-move. Park (2011) defines mobile learning as using mobile devices for learning on the move across contexts. Traxler (2007) expresses the view that mobile learning is based on the principles and practices of technology-enhanced learning as well as other learning principles used in the classroom and community. Mobile learning was defined by Barbosa, Reinhard, Saccol and Schlemmer (2010) as a teaching and learning supported by mobile and wireless information technologies and involving the mobility of human subjects far from formal educational spaces or work places.

Cronje and El-Hussein (2010) extend the aspect of learning contexts in a more thought provoking definition of mobile learning for the needs of instructional designers. They include not just the mobility of the technology and learner, but also the mobility of the learning, which allows for the context of the learning to be highly individualized. As mobile content consumption continues to rise, educators need to be prepared to deliver training to mobile learners (Park, 2011). Also, with the increasing prevalence of mobile learning, educators and instructional designers need to account for the increasingly personal context of education (Cronje & El-Hussein 2010).

Yusuf, M. O., Fakomogbon, M. A., Mejabi, O. V. Tella, A. & Bolaji, H. O.

Evaluation of Ubiquitous Collaborative Mobile Learning (UCML) Model: A Flexible Instructional Design Principle for Mobile Instructional Content Delivery

A new teaching and learning concept is fostering, and a new instructional design model is needed to facilitate mobile teaching and learning in education (Shih, 2005). The goal of instructional design is to help the teaching and learning process by ensuring that education experiences are optimized for particular learning goals, especially when different mix of media are used (Nichols, 2007). Some researchers argued that mobile learning will require a new approach for both teaching and learning (Ozdamli, 2011). As such, educators and instructional designers face a challenge of determining how to use these powerful new tools in learning applications (Cronje & El-Hussein, 2010).

In order to effectively support mobile education, instructional principles must be identified, which is pedagogically sound and will address the mobile learning context in terms of usability (Gu, Gu, & Lafferty, 2011). Therefore, a set of instructional principles and design model is necessary in order to apply it to learning possibilities on mobile devices that allows for ability to take training whenever, wherever and have access to 'just-in-time' learning opportunity (Evans, 2009). Current instructional design models and methods were developed to design instruction for delivery on personal desktop computers that have large screens (Ally, 2005). According to Cronje and El-Hussein (2010), students learning via mobile delivery are not only remote from their instructor, they can fully control the information they choose to interact with on their device.

However, there is a trend towards the use of mobile devices to deliver learning materials, and for students to learn anytime and anywhere. The use of mobile devices for learning has implications in regard to how learning materials are designed using learning theories and instructional design principles (Dillard, 2012). Meanwhile, Sharples, Taylor and Vavoula (2010) submitted that mobile device ownership is expanding and mobile device capabilities are expanding to include features such as cameras, media players, and other functions previously only supported on multimedia computers. Learning using the support of mobile devices can also allow learners to use a single device which can be moved between classrooms and in contexts outside of education (Quinn, 2011). It was further asserted by Bruns, Cobcroft, Smith and Towers (2006) that mobile instructional design principles must account for how to use learning activities to engage learners, acknowledge the learning context, challenge learners, and provide opportunities for practice in order to contribute to quality learning experiences.

By considering learners' creative, collaborative, communicative and critical engagement, a framework for mobile learning can provide meaningful insight into a mobile learner's achievement of knowledge (Dillard, 2012). Muyinda (2007) posited that mobile learning instructional design models must take into account the ubiquitous use of personal and shared technology. It is therefore important to have an operational understanding of the context in developing a user interface that is both useful and flexible (Uden, 2007). A set of mobile learning instructional design principles which enable the development of mobile learning that is usable, effective, and has a high level of learner satisfaction is of paramount importance (Kukulska-Hulme, Pachler &Vavoula, 2009). According to Park (2011), instructional designers need to learn about the concepts of mobile learning and how mobile technologies can be incorporated into their teaching and learning more effectively.

In the submission of Cagiltay, Gedik, Hanci-Karademirci and Kursun (2012), mobile instruction was designed to help students review the content and practice sample questions via their cellular phones in which it will be appropriate when it contains multimedia components rather than just text, and also when the instruction is spread out over time. With reference to the fore statement, it can be concluded that instructional design team needs to consult with and receive help from the subject matter expert on content, duration, scheduling, and any changes to face-to-face instruction in order for mobile learning to be effective and add value. Through designing an easy to navigate interface and increasing the use of multimedia over textual display, a much higher rate of efficiency will be achieved through a mobile platform (Haag, 2011). In this context, Arnedillo-Sánchez, Milrad, Sharples, and Vavoula, (2009) suggested reason to understand how people learn through mobile, pervasive, lifelong interaction of technology via understanding the implications of learning with mobile technology by accurately adopting a design model that will address all pertinent considerations or issues.

If mobile learning is not applicable and designed to match the needs of the learner, the learner can choose not to interact with it (Cronje & El-Hussein, 2010). The idea of ability to use mobile devices for learning while engaging in an ongoing task in a physical environment may enhance sense-making process by enabling students to step in and out of the tasks and reflect on these transitions (Connelly, Hazlewood, Rogers & Tedesco, 2009). Additionally, the quality of the interactions will also be guided by how comfortable the instructor is able to map-out strategies for guiding a discussion that integrates the information available on the digital device. In the explanation of Cronje and El-Hussein (2010), instructional designers often continued not to adapt their designs to consider the entire context in which a learner will use a particular mobile learning program, but instead, borrow ideas from their e-learning experiences which do not always translate well to mobile delivery. Mobile learning is not about repurposing laptop e-learning, so it fits on a smaller device which contains instructional contents that is concise, short burst of learning and performance support.

Also, designers and practitioners of education should clarify the design paradigm shifts that this mode of delivery has introduced into the world of practice in order to ensure mobile learning is effective and efficient and the continuing needs of their students are being met (Dillard, 2012). In ensuring mobile learning effectiveness and efficiency in consonant with students' needs, evaluation of the content-user interface and other associating parameters is pertinent in the assessment system to meet the changing demands of quality assurance and quality improvement for learning resources as argued to by Leacock and Nesbit (2007). However, Liu and Johnson (2005) are of the opinion that the accelerating quantity and complexity of online resources is focusing attention on the inconsistent in instructional content quality evaluation.

Evaluation instruments designed specifically for smaller digital resources are needed for three reasons; (a) the design of multimedia learning materials is frequently not informed by relevant research in psychology and education, (b) to mitigate the search problem and finally, (c) the quality criteria for evaluations have the potential to drive improvements in design practice (Leacock & Nesbit, 2007; Vargo, Nesbit, Belfer, & Archambault, 2003; Shavinina & Loarer, 1999). These three major reasons can result in easy access to many ready-made learning objectives of high quality, and making the process of shifting through repositories or the web to find high-quality resources less time-consuming. The efficacy of this technique could be directly dependent on the validity of the evaluation tool used to generate the quality ratings. However, in the explanation of Shelton (2011), evaluating quality standard in online learning is a complex and difficult concept that depends on a range of factors arising from the student's interaction, the context of curriculum, the instructional design approach and technology used for the delivery of online instruction. Shelton and Saltsman (2004) postulated that the mark of quality for an online education program is not its growth rate but the combination of retention rate, academic outcomes, and success in online student and instructor's support.

Few experienced evaluators, however, pick one model and adhere to it for all of their works; they are more likely to draw upon different aspects of several models (*Owston,* 2008). Each evaluation models presents a specific direction in evaluating quality of technology and instructional content as the case may be. Meanwhile, *Bates (1995) ACTIONS model of quality online instructional content is specifically developed* to evaluate instructional technologies in education (**A**ccess and flexibility, **C**osts, **T**eaching and learning, **I**nteractivity and User-friendliness, **O**rganizational Issues, **N**ovelty, and **S**peed are the stages). This model was designed to help with the selection of instructional technologies for delivery of instructional content and it was one of the first to address cost factors which affect both the institution and the student. Students, through mobile learning platform, can work together on a task, exchange their views, experiences, opinions, discuss and negotiate strategies, actions and results (Vasiliou & Economides, 2007).

These actions can provide students with opportunity to assist, explain, teach, understand, review and influence each other. By developing a learning community, it could also provide the opportunity to combine the special abilities of everyone to achieve a common goal in a collaborative means. In the submission of Vasiliou and Economides (2007), collaborative learning is a student-centered, task-based, activity-based learning approach that provides several advantages to the student. It can assists the student to enhance the skills of communication, interpersonal social relationship, cooperation of sharing and caring, openness, flexibility, adaptability, knowledge retention, higher-order of critical thinking, creativity, management, practicality, responsibility, trustworthiness of dependability, involvement, engagement of participation, commitment of persistency, motivation, confidence and self-efficacy. Meanwhile, it is an educational method in which students work together in small groups towards a common goal (Dillenbourg, Baker, Blaye & O'Malley, 1996; Hafner & Ellis, 2004).

Groups in collaborative learning techniques are dynamic in the context of activities engagement as identified by Cerbin (2010). In a training workshop organized in the Center for Advancing Teaching and Learningin 2010 at the University of Wincousin, five major collaborative learning echniques were identified; thinkpairshare (TPS), reciprocal teaching (RT), thinkaloud pair problem solving (TAPPS), group grid (GG) and group writing assignments (GWA). Each of the identified collaborative group aforementioned has their dynamics and extent of collaboration mode. Understanding online group dynamics present excellent effective collaborative activities (Dooly, 2008). According to Salmon (2000), online model provide an excellent group collaborative association with incorporation of five phases; access and motivation, online socialization, information exchange, knowledge construction and construction. This model can provide exceptional opportunity for effective communication within and among the various groups taking part in a ubiquitous collaborative mobile learning environment.

The instructor's cognitive, managerial skill and social presence play a vital role in relation to the learning progression where learners collectively engage in learning process. The extent of learning engagement through mental exercise, management of learning process and duration of social presence by students within the groups leads to the learning outcome (Jahng, Chan & Nielsen, 2010). This is measure via the knowledge construction, the quality of the task given and the course mark or score. In this perspective, level of interaction and communication when analyzed display the quality, quantity and share/transfer of knowledge for effective and efficient collaborative learning (Jahng, Chan and Nielsen, 2010). Hence, this study investigated the evolvement of Ubiquitous Collaborative Mobile Learning Model for the design and development of instructional content for mobile learning environment.

Yusuf, M. O., Fakomogbon, M. A., Mejabi, O. V. Tella, A. & Bolaji, H. O.

Evaluation of Ubiquitous Collaborative Mobile Learning (UCML) Model: A Flexible Instructional
Design Principle for Mobile Instructional Content Delivery

Research Question
The following are the research questions in which answers were sorted for in the experimental validation exercise:
1. Does the design principle of UCML address interactivity in a mobile learning environment?
2. Does the design principle of UCML address screen design for mobile learning environment?
3. Does the design principle of UCML provide appropriate feedbacks for a mobile learning environment?
4. Is there significant difference in the ratings between student and expert's experimental validation of UCML model for mobile learning environment

Methodology
      This study is a design-based research involving the experimental validation of a ubiquitous collaborative mobile learning model. The design and development principle were conducted in compliance with the Ubiquitous Collaborative Mobile Learning (UCML) Model evolved from the synchronization of four different models. The models were important in one way or the other for a complete mobile learning experience. The synchronized four models are SMSE by Shih (2005), ADDIE, Salmon online collaborative model and Bates (1995) evaluation models. The experimental validation took two forms; student and expert's validation. The student samples consisted of 18 senior secondary school two (SSS II) of Nigerian educational system. The students were exposed to the mobile learning instructional content designed and developed based on UCML guidelines through the principle of BYOD (bring your own device). Samples were exposed to the treatment (textual and animated videos) for three weeks. In addition, 16 experts were also exposed to the mobile learning instructional content in practical terms as the students.

The expert validators were made up of five educational technologists, six subject matter teachers, three graphic designers and two web designers. A researcher-designed questionnaire was used to gather responses from both categories of validators and the response mode for the validators is a rating scale ranging from 0-5. The questionnaire was subjected to validation exercise with a reliability test conducted using Cronbach Alpha Reliability Coefficient which yielded 0.93 implying that the instrument is reliable. Mean and standard deviation was used to answer research questions and t-test was employed to analyze the hypothesis raised.
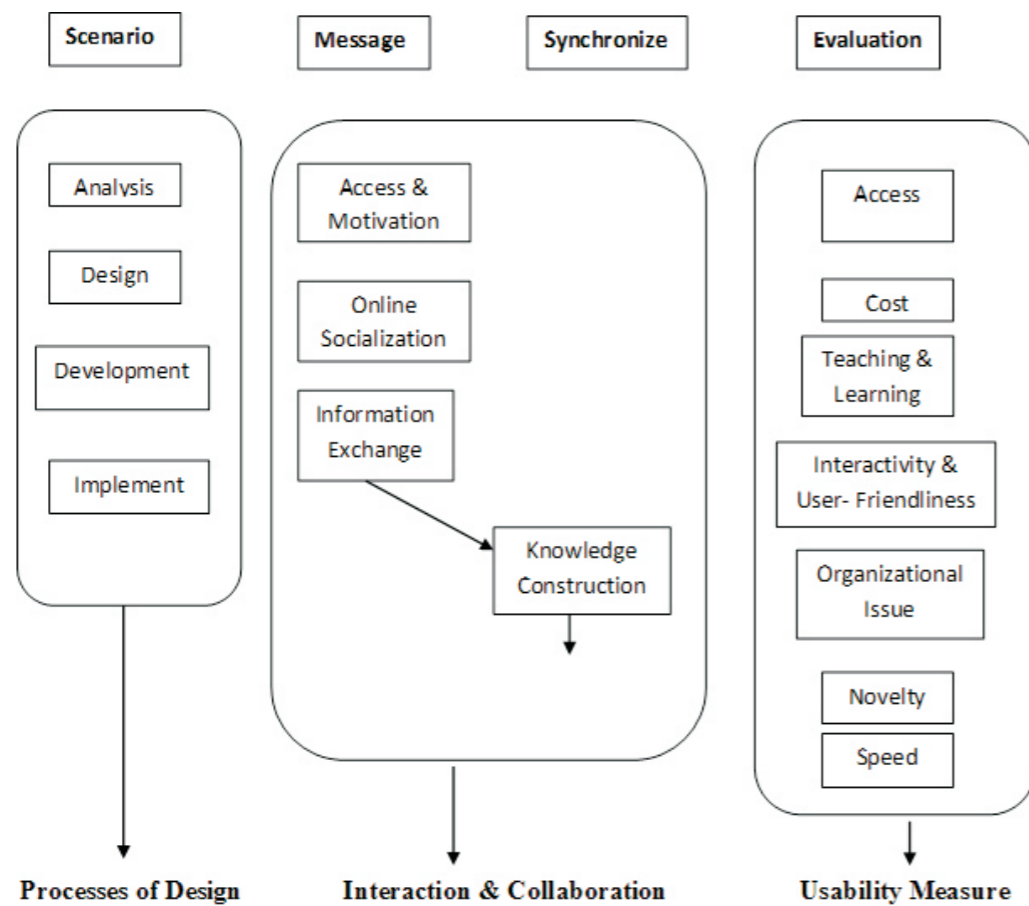
Figure 1: Ubiquitous Collaborative Learning Model (UCMLM)

Data Analysis and Results

Research Question 1: Does the design principle of UCML address interactivity in a mobile learning environment?

Table 1:
Ratings of Expert and Student's Validation of User Interactivity Component of UCMLM

User's Interactivity		1	2	3	4	5	M	SD
1	The interactivity mode is appropriate for the maturity level of the students in a collaborative mobile learning environment	--	--	02	13	19	4.5	0.62
2	The window environment provides adequate opportunity for interaction in a collaborative mobile learning environment	--	--	07	18	09	4.1	0.69
3	The content is chunked into small segments in compliance with mobile learning etiquette	--	--	09	11	14	4.1	0.82
4	The groupings prompt students to collaborate effectively for knowledge construction	--	--	--	18	16	4.5	0.51
5	The window environment allows learners to discover information through active exploration and participative collaboration	--	--	04	19	11	4.2	0.64
6	The "ask your tutor link" serves as help key to get procedural information	--	--	--	28	06	4.2	0.39
7	Content map key for seeing a list of options available	--	--	02	21	11	4.3	0.57
8	Menu key for returning to the main page is appropriate	--	--	01	26	07	4.2	0.46
9	Quit key, for exiting the program is appropriate	--	06	09	18	01	3.4	0.82
10	Comment key for recording a learner's comment is appropriate	--	--	06	23	05	4.0	0.58
11	The notification page is appropriate to link current task	--	--	--	21	13	4.0	0.58

      The average mean for user interactivity component of UCMLM is 4.1 which serve as the benchmark. Therefore, it could be concluded that the design principle in the UCMLM addresses user interactivity for a mobile learning environment. This could be deduced from the mean of ratings as majority exceeds the benchmark (4.1) with exception of items 9, 10 and 11. In conclusion, it is an expressive opinion of the validators that the UCMLM design principle supports user interactivity in a mobile learning environment.

Research Question 2: Does the design principle of UCML address screen interface design for mobile learning environment?

Yusuf, M. O., Fakomogbon, M. A., Mejabi, O. V. Tella, A. & Bolaji, H. O.

Evaluation of Ubiquitous Collaborative Mobile Learning (UCML) Model: A Flexible Instructional
Design Principle for Mobile Instructional Content Delivery

Table 2:
Ratings of Expert and Student's Validation of Screen Interface Component of UCMLM

	Screen Interface	1	2	3	4	5	M	SD
				Ratings				
1	Screens are designed in a clear and understandable manner	--	--	11	21	02	3.7	0.57
2	The design does not overload student's memory	--	--	09	12	13	4.1	0.51
3	The use of space is according to the principles of screen design	--	--	11	13	10	4.0	0.80
4	The design uses proper fonts in terms of style and size	--	--	--	19	15	4.4	0.50
5	The use of text follows the principles of readability	--	--	--	17	17	4.5	0.51
6	The colour of the text follows the principles of readability	--	--	--	--	34	5.0	0.00
7	There is consistency in the functional use of colours	--	--	--	--	34	5.0	0.00
8	The quality of the text, images, graphics and video links is good	--	--	--	21	13	4.4	0.50
9	Presented pictures are relevant to the information included in the text	--	--	05	18	11	4.2	0.67
10	The use of graphics supports meaningfully the text provided	---	--	08	21	05	3.9	0.62
11	A high contrast between graphics and background is retained.	--	04	09	10	11	3.8	1.03
12	The mobile learning web can be used for cross-platforms	--	--	--	11	23	4.7	0.47

The average mean for screen interface component of UCMLM is 4.2 which serve as the benchmark. Therefore, it could be concluded that the design principle in the UCMLM addresses screen interface for a mobile learning environment. This could be deduced from the mean of ratings as majority exceeds the benchmark (4.2). In conclusion, it is an expressive opinion of the validators that the UCMLM design principle supports screen interface in a mobile learning environment.

Research Question 3: Does the design principle of UCML provide appropriate user's feedback mechanism for a mobile learning environment?

Table 3:
Ratings of Expert and Student's Validation of User Feedback Mechanism Component of UCMLM

	User Feedback Mechanism	1	2	3	4	5	M	SD
				Ratings				
1	The window environment provides feedback immediately after a response	--	--	--	11	23	4.7	0.47
2	The window environment provides feedback to verify the correctness of a response	--	--	--	19	15	4.4	0.50
3	For incorrect responses, information is given to the student about how to correct their answers, or hints to try again	--	--	--	18	16	4.5	0.51
4	Documentation exist regarding technical requirements for students' need	--	--	09	11	14	4.1	0.82
5	The updating, modifying and adding procedures are relatively easy for an average user	--	--	06	23	05	4.0	0.58
6	The wiki chat medium provides appropriate feeds among students and instructors	--	--	--	17	17	4.5	0.51
7	The admin window environment is appropriate and adequate	--	--	--	--	34	5.0	0.00

The average mean for user feedback mechanism component of UCMLM is 4.4 which serve as the benchmark. Therefore, it could be concluded that the design principle in the UCMLM addresses user feedback mechanism for a mobile learning environment. This could be deduced from the mean of ratings as majority exceeds the benchmark (4.4). In conclusion, it is an expressive opinion of the validators that the UCMLM design principle supports user feedback mechanism in a mobile learning environment.

Discussion and Recommendation

The design of instructional content for mobile learning environment requires simplicity in term of the screen interface, user interactivity and feedback mechanism. From the results analyzed, it was revealed that the UCMLM design principle addressed the user interactivity. Also, the finding of this study shows that the design principle of UCLMLM addresses the screen interface for effective mobile learning environment. Finally, it was revealed that the design principle as well addressed the user feedback mechanism which was evident in the result displayed in Table 3. Hence, conclusively, the design principle of UCMLM addressed the issues of user interactivity, screen interface and user feedback mechanism. Based on the conclusion, the following is recommended:

1. UCMLM can be used to design the interactivity level of users in a mobile learning environment.
2. UCMLM can be used to design the screen interface of a mobile learning environment for users for learning purpose.
3. UCMLM can be used to design the feedback mechanism for users in a mobile learning environment.

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TECHTEACHING? THE GOOD, THE BAD AND THE UGLY

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Abstract

As fascinating as the idea of teaching and learning with technology sounds, in reality it could be a myth. The beautiful stories of how fun Techteaching is, intrigues both teachers and students to venture into it - that's the good. The bad however is when you enthusiastically create a Techteaching experience in class and students complain about the reality of making it work for obvious reasons of lack of resources to facilitate it. You are eventually dealt with a blow of the ugly fact that you have to go back to the drawing board and make do with what you have to make learning occur at yours' and students' expenses. This article relates the experiences in two tech-based courses over a semester in the department of educational technology, University of Ilorin, Nigeria. A google App – google classroom was the platform with which the students were taken through the two courses. Content analysis of the activities on the google classroom was carried out which includes screenshots of activities to show evidences of students' participation. The experiences of the students in their own essay were also content analysed to extract the themes that recur and their conclusions with the techteaching.

Introduction

The use of technology in teaching goes beyond just using any technological tool available to teach, but it requires teachers and students to go extra length in ensuring learning takes place. Teachers and students alike are often overwhelmed by the benefits of technologies in teaching such that they decide to use them without understanding the rudiments of integrating technology in teaching. Many factors affect the use of technology in teaching that users often overlook their effect on teaching and learning. These factors could include issues of technological resource availability, competence of users and their disposition towards technology, institutional support and training opportunities. When new technologies are introduced into any system, there is need for continuous training, adequate provision of resources and commitment on the part of users. In line with this, the university of Ilorin dedicated to improving its educational services through the introduction of new technologies in students' learning experience, provided elearning opportunities for lecturers to extend to students. Thus, the Google App training especially the google classroom was conducted across faculties in the university, internet facilities were made available and lecturers are beginning to optimise this opportunity (Unilorin Bulletin, 2016). In order to x-ray the experiences lecturers and students are getting from this elearning platform, the good, the bad and the ugly of their experiences in two courses that employed the google classroom were explored.

The Google App

The Google Apps for Education cover a wide range of free applications provided by GOOGLE to facilitate teaching/learning and interaction between and among teachers and students. Google apps have similar functional Web applications with traditional office suites, which includes: Gmail, Hangouts, Google Calendar, Drive, Docs, Slides, Groups, News, Sheets, Play, Sites, Google classroom and a host of others, see figure 1 below:
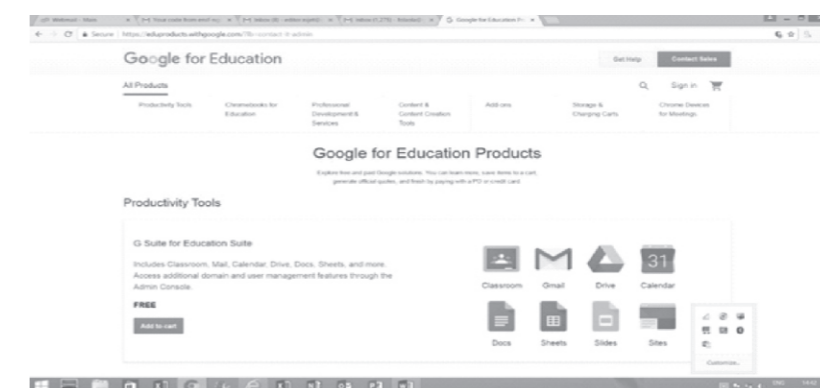
Figure 1: Google for Education Products
Source: https://eduproducts.withgoogle.comhttps://en.wikipedia.org/wiki/Google_for_Education accessed 05/06/2017

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Techteaching? The Good, The Bad and The Ugly

The Google Classroom

Google Classroom is a blended learning platform developed by Google to create an exciting experience for both teachers and students to conduct classroom activities in a paperless manner. Google Classroom is opened to any personal Google user to create and teach a class with invited students and experts participating asynchronously *(Etherington, 2017)*. Students can be invited to classes through the institution's database, through a private code, or automatically imported from a school domain. Each class creates a separate folder in the respective user's Drive, where the student can submit work to be a graded by a teacher. Teachers can monitor the progress for each student, and after being graded, return work, with comments, for the student to revise and improve the assignment and post announcements to a class stream, where students can comment. Teachers can also manage multiple classes, reuse existing announcements, assignments, or questions from another class, share posts across multiple classes and archive classes for future classes. Google Classroom combines Google Drive for assignment creation and distribution, Google Docs, Sheets and Slides for writing, Gmail for communication, and Google Calendar for scheduling (Google, 2017). The google classroom can be accessed through google search for google classroom or from users' gmail account with a click on the classroom icon (figure 2) from icons on the top right side of the user email.
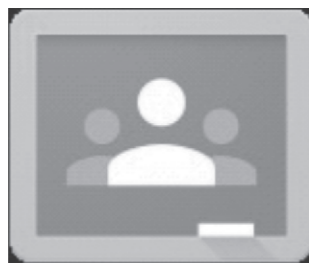
Figure 2: Google classroom icon

With all the fantastic features and opportunities afforded by google classroom, it has gained a lot of reception, use and review across board. Bodies who have reviewed the google classroom include: elearningindustry, TechCrunch and Electronic Frontier Foundation. Some of the criticisms levied against it are: heavy integration of Google apps and services with limited or no support for external files or services, lack of automated quizzes and tests, and a lack of discussion forums or live chats that can aid in feedback efforts, data mining of students' browsing history, searches, and other usage of services for advertising, enabling the mass collection and storage of information on children without the consent of their parents (*Lapowsky, 2014; Luckerson, 2015*). Though some of these criticisms have been worked upon and improved upon by Google over the years as review comments are taken care of by the google technical experts (*Ressler, 2017*). On the other hand, google Classroom's strengths as the bodies reviewed are: ease of use, universal device accessibility, use of Google Drive as an effective way for teachers to quickly share assignments with students, the paperless process meaning the end of printing, handing out, and potentially losing work, and the fast feedback system between students and teachers (*Olanoff, 2015; Dilger, 2017*).

As much fascinating as the idea of google classroom is, its wide reception (Ressler, 2017) and some of the criticism levied against it, challenges with regards to its actual use by end users have not been much recorded (*Pappas, 2015*). *It is on this premise, that this study reports the experiences of both lecturers and students in two classes conducted with google classroom in University of Ilorin, Nigeria.*

E-learning in University of Ilorin: The Introduction of Google Apps for Learning

The university of Ilorin constituted the e-learning committee to map out modalities for the university to launch its e-learning opportunities for staff and students. The committee recognising the fact that the university is still in its infancy to go for a large scale e-learning structure recommends a feasible start up. Going by the university's memorandum of understanding with google, the committee decided to premise the university's elearning on the google apps for education, specifically the google classroom. Series of training for academic staff on how to implement google classroom were conducted across the university to facilitate the smooth start up of elearning in the university. Since then onwards, faculties, departments and individuals have taken up the initiative to implement the google classroom in their teaching activities. (Unilorin Bulletin, 2016) It is therefore, imperative to understudy how the experience has fared since inception looking at its good, bad and ugly while considering the overall technological state of the university. The university of Ilorin is rated in its webometric as the 8th university in Nigeria given its internet speed at 622 Mbps (megabits per second) to 630 Mbps on the STM-4 fibre bandwidth, online presence and its technological capacity and impact (figure 3).
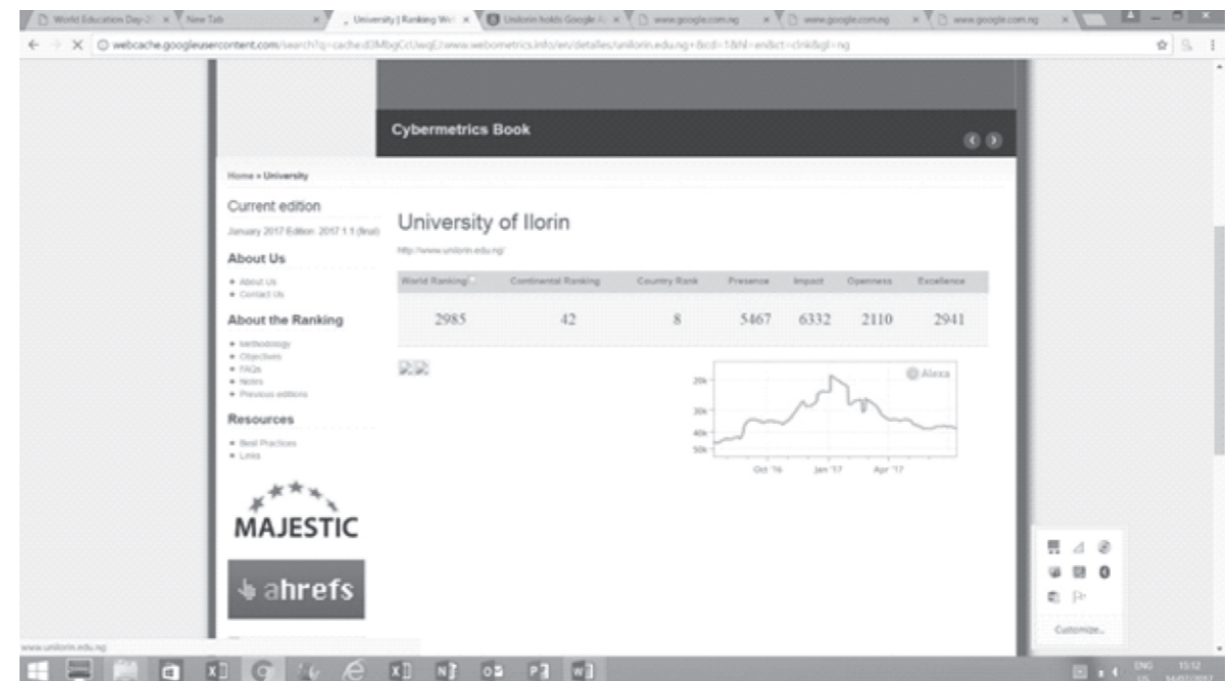
Figure 3: University Ranking in Nigeria
Source: http://www.webometrics.info/en/detalles/unilorin.edu.ng

Experience in the Two Classes: A Content Analysis.

The two courses titled: "Educational Games and Simulations" and "Computer Science Education Methodology Course" were taught with 'Google classroom' in the department of Educational technology, university of Ilorin, Nigeria in harmattan semester 2016/2017 session. In Educational Games and Simulation, two assignements were given as screenshot below in figure 1 and 3 respectively. The first assignment, out of excitement to use the app was attempted by seven students out of eight, figure 2 shows evidence of submission of assignment 1 by one of the students. However, no student attempted the second assignment on the Eucational games and simulation google classroom platform but they submitted offline giving the excuses of electricity and internet outage (figure 4).
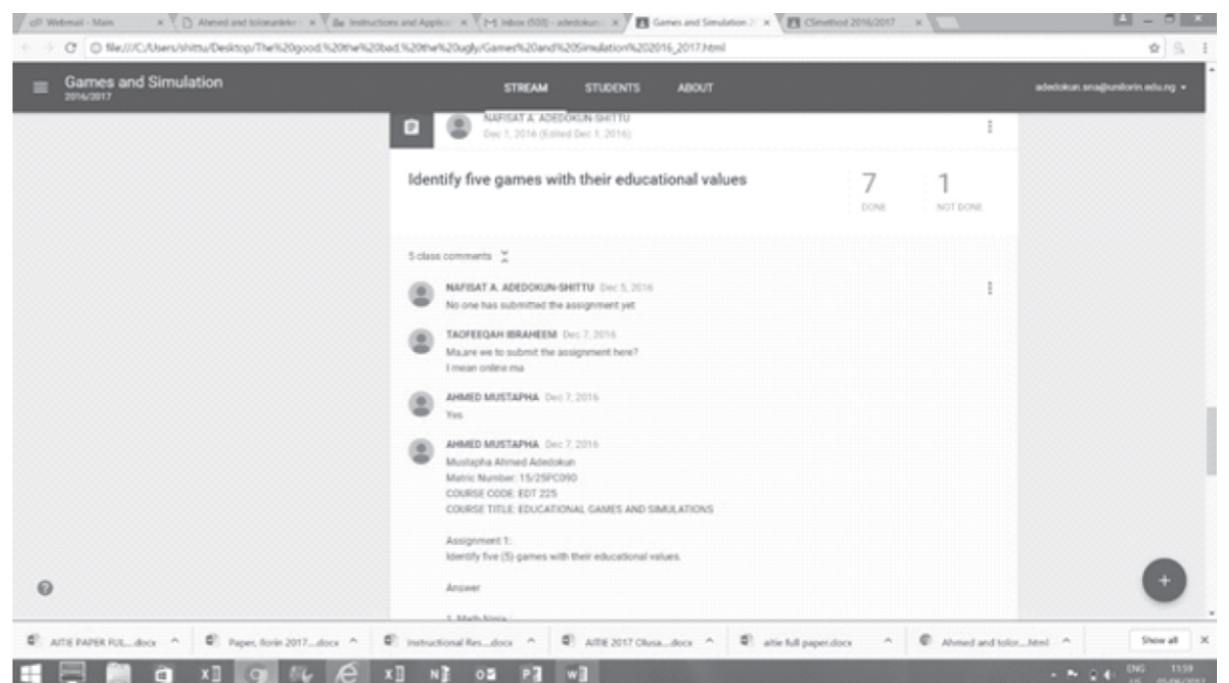
Figure 4: Assignment 1
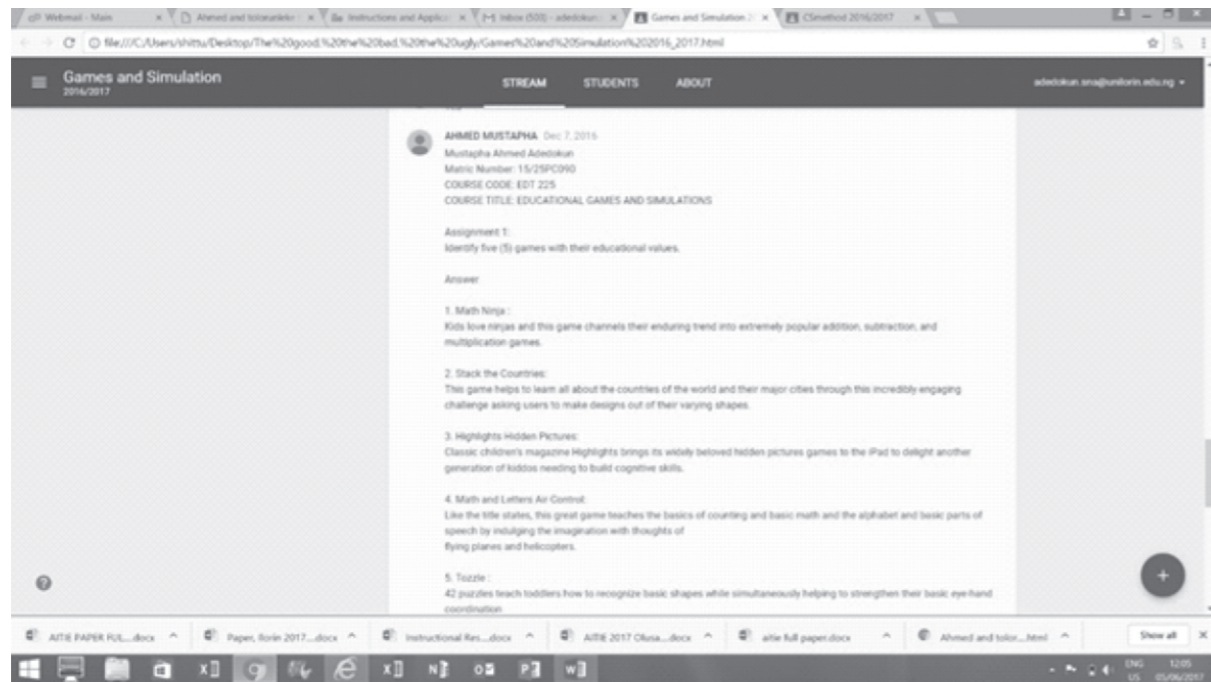
Figure 5: submission of assignment 1 by one of the students
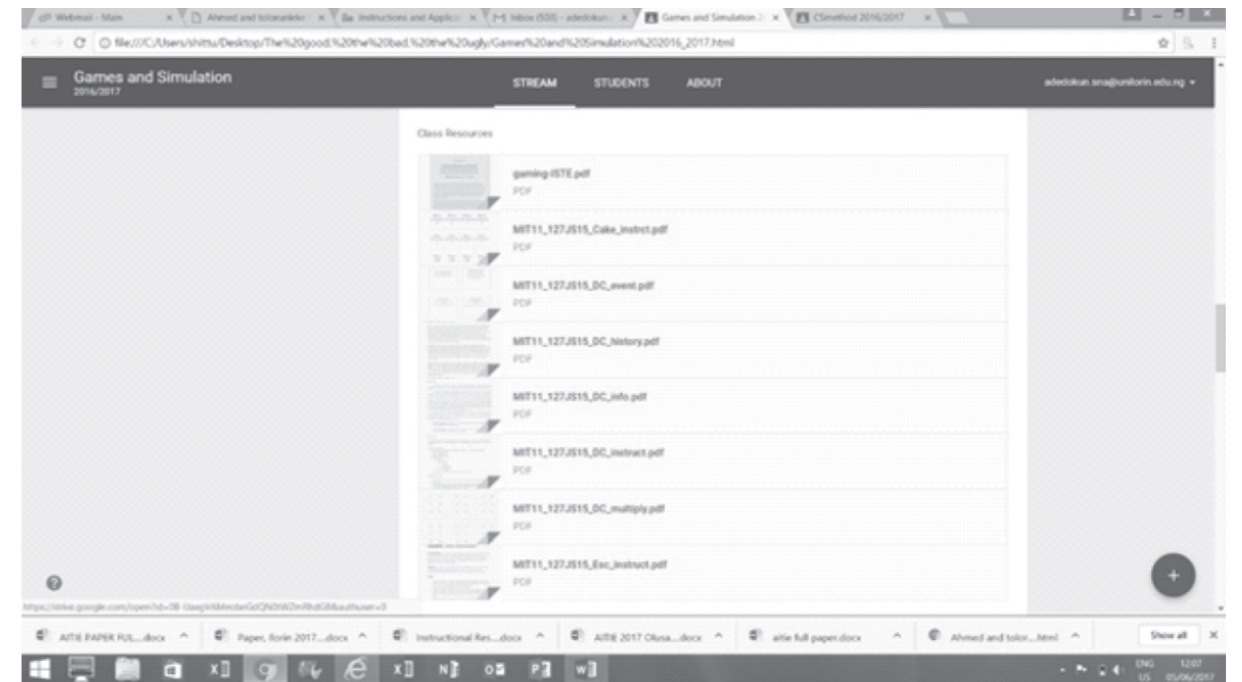
Figure 7: Class resources
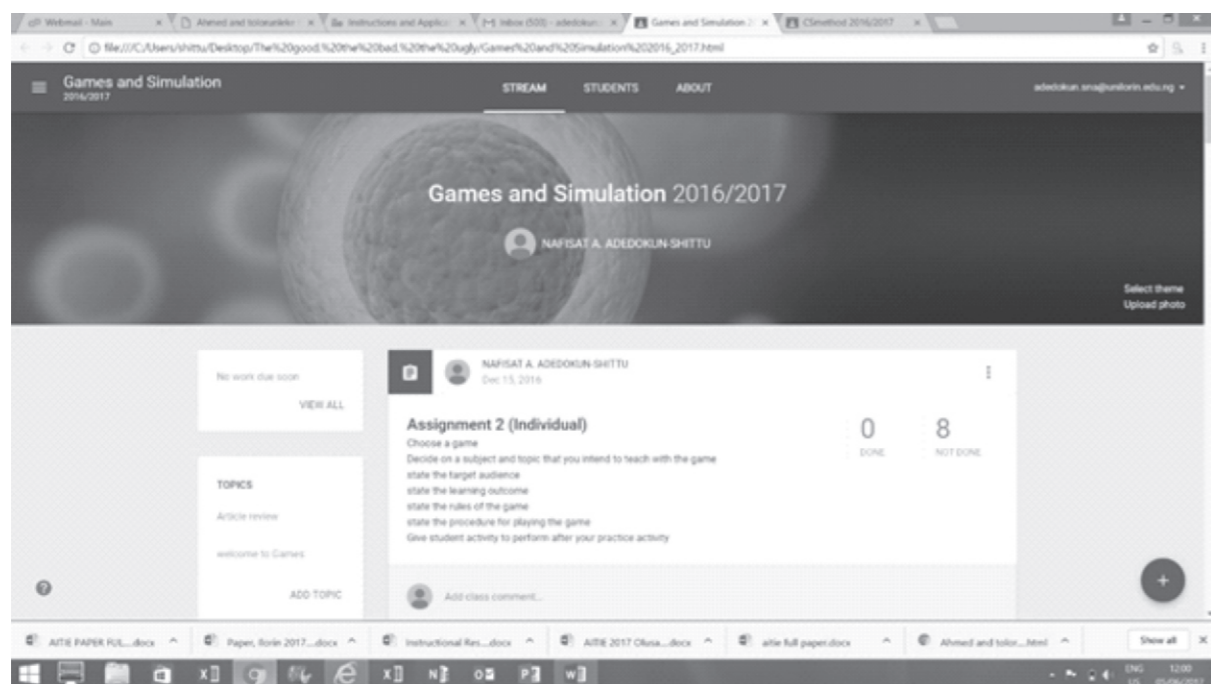
Figure 6: Assignment 2
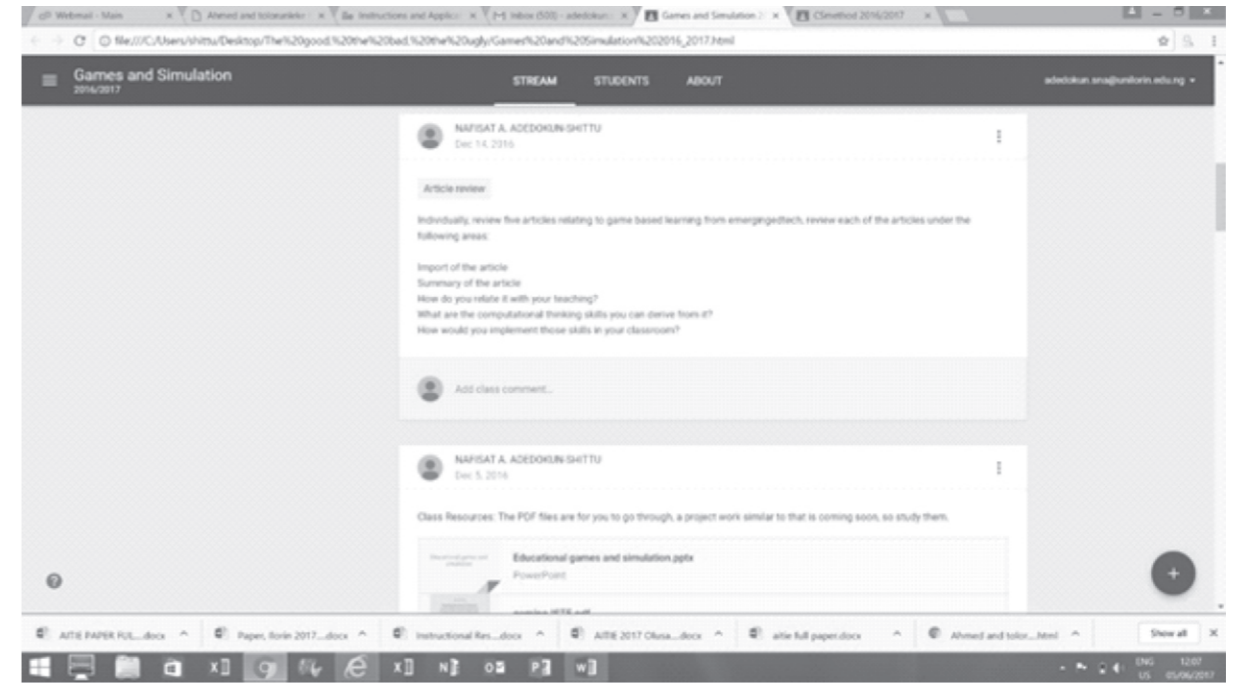
Figure 8: Article review

Class resources were also uploaded for students' access (figure 7) to help them gain a broader insight into the concept of educational games and simulation. They all accessed the files but did not download them, complaining that they use mobile data to access the google classroom but it will be economically draining to download the files with mobile data since the university wi-fi was epileptic. The students eventually copied the files through their drives from the lecturer's laptop. They were also given some articles to review through which they expressed their own understanding of the concept of games and simulation (figure 8). They submitted the articles offline but accessed the google classroom to get the review instructions.

For the second course - computer science methodology, article review, individual and group assignments were given. Figure 9 displays the announcement given regarding the group assignment with an attachment of the class lecture audio file.
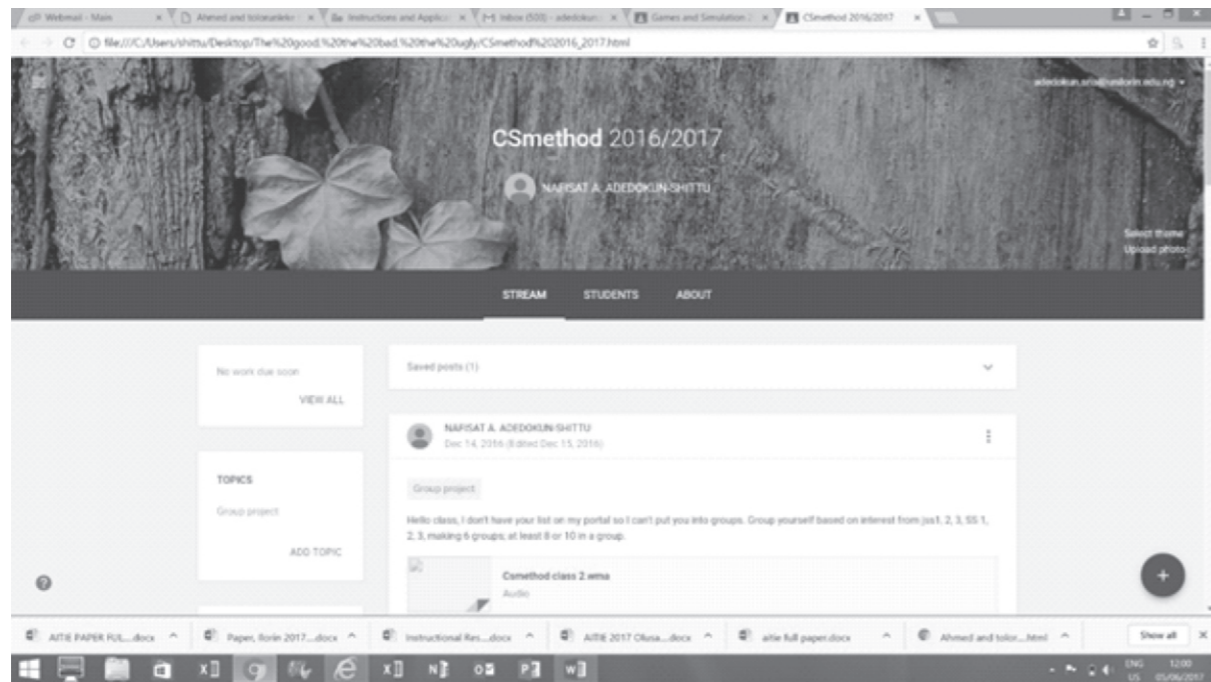
Figure 9: Announcement on Group Assignment

For the article review, just two students attempted the online submission while 40 others who joined the google classroom did not attempt. Though all the 53 students registered for the course submitted their article review offline (figure 10). Likewise for the individual assignment, eight students responded on the google classroom while 38 did not (figure 11). Resources for the course were also uploaded for students' access (figure 12), but just the few students who accessed the google classroom shared with other students who could not access it because of excuses of internet access.
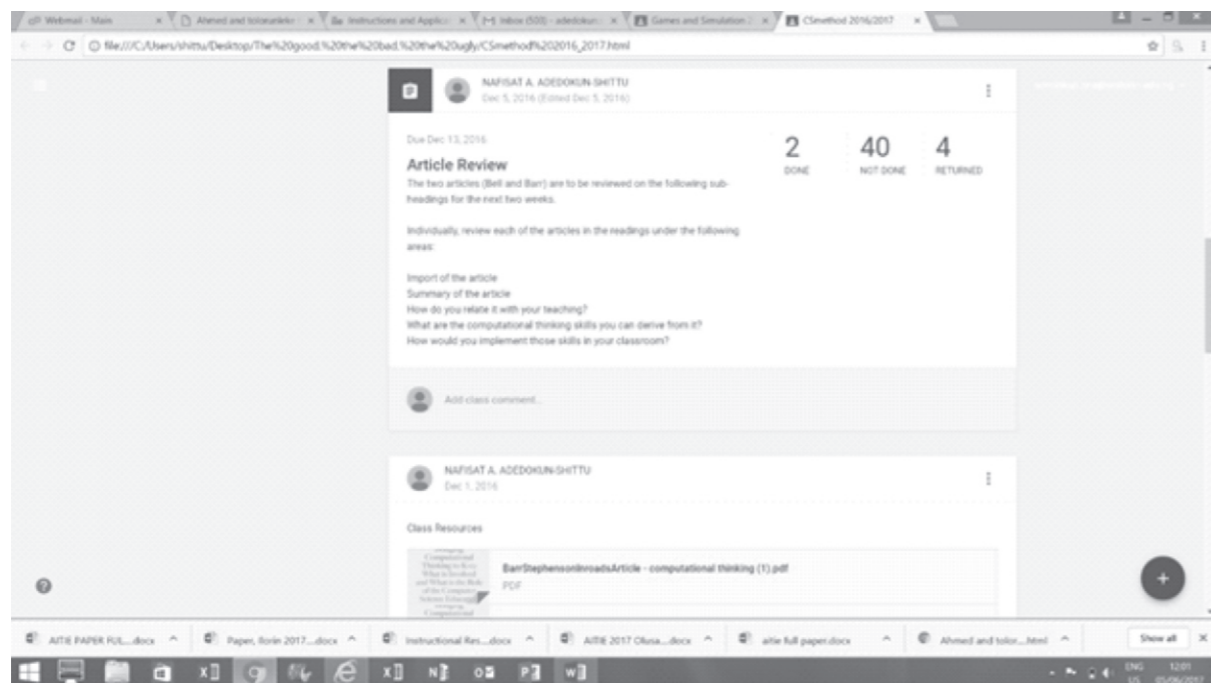
Figure 10: Article review (Csmethod)
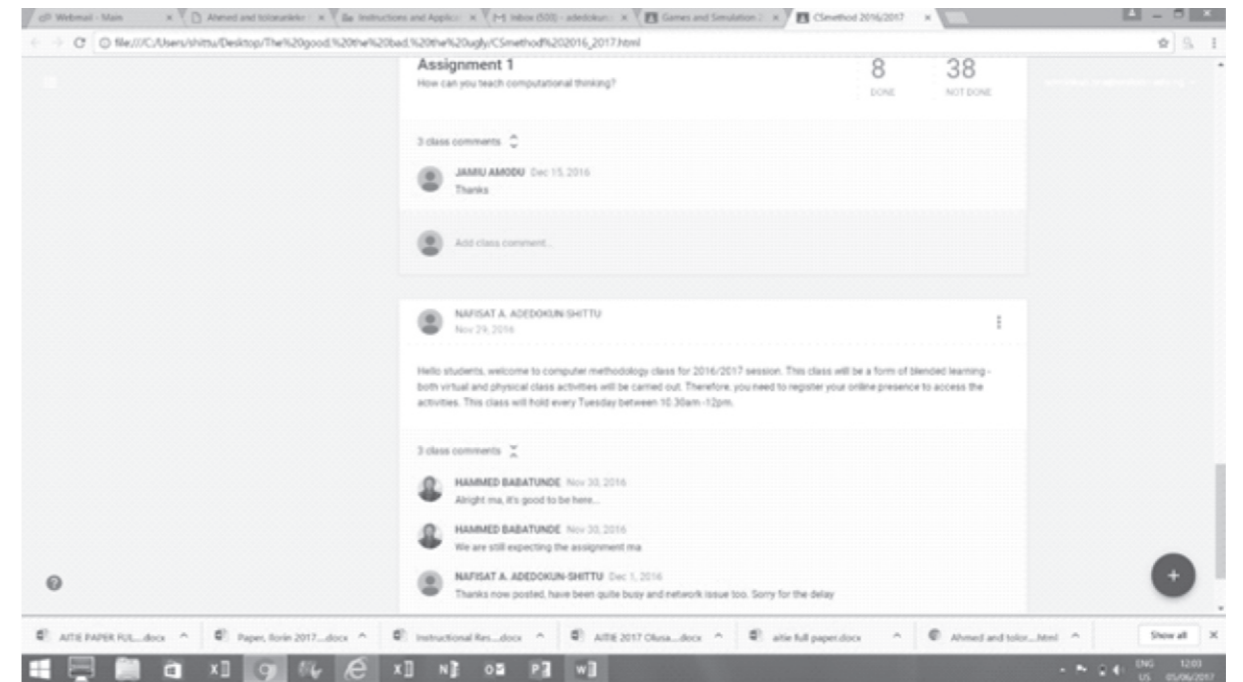
Figure 11: Individual Assignment Csmethod
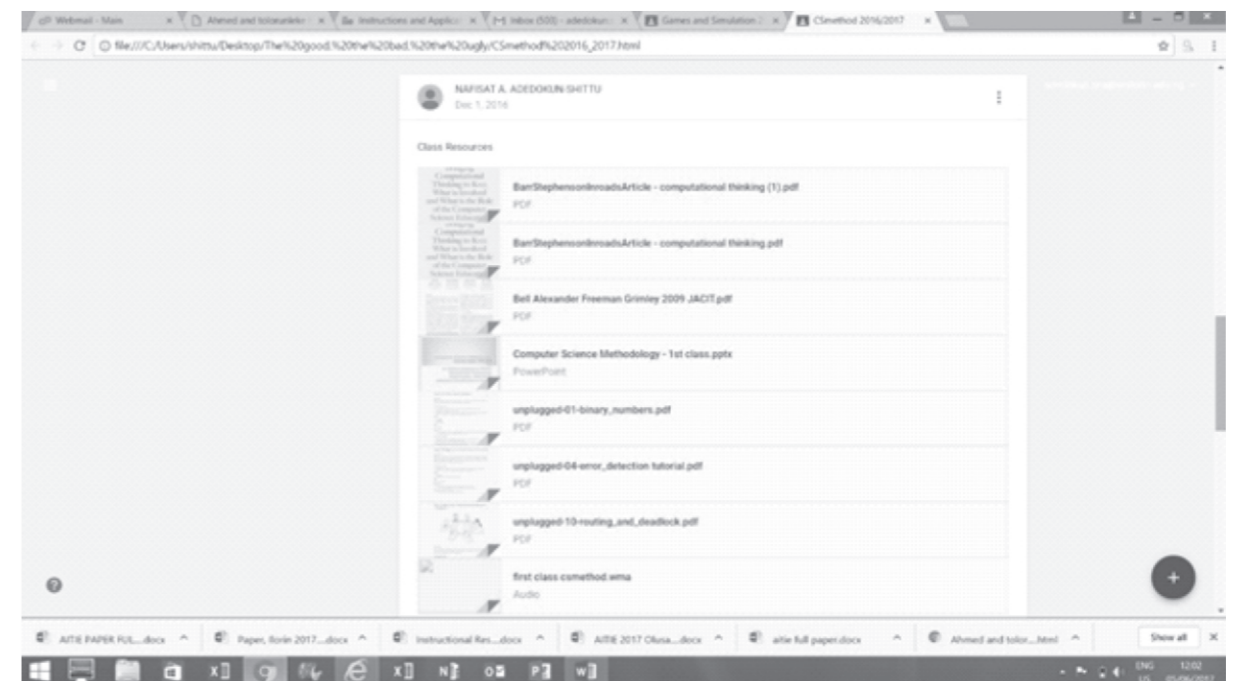
Figure 12: Class Resources Csmethod

Analysis: The Good, The Bad and The Ugly

Students in both classes gave an overview of their experiences with the google classroom under the analysis of the good, the bad and the ugly of their experiences. The exciting experiences they had constitute the GOOD, the bad however is when the good was going and some reality sets in that turns the situation into an intolerable experience and the UGLY shows its face when students and lecturers had to abandon the technology approach to ensure learning takes place within the time frame of the semester. Each student from both classes did a write-up on the good, the bad and the ugly of their class experiences with google classroom, one students' comment each for the two courses are reported. One of the students in Method course, A1 expressed his views regarding the GOOD thus: "*The good I would like to mention in this section about the course is the integration of several technological processes to the class despite the absence of devices for undertaking it but we have been able to improvise to an extent and that has aided my knowledge of improvisation.*" From his submission of the good, he also hinted the bad and further explained what constituted the bad in his later submission that: "*though this course on its own is a wonderful experience for prospective teachers like myself, but I stand at the losing end due to the poor internet connection and my not possessing a personal computer.*"

Sometimes, I have to leave the comfort of my house to sleep at my friend's house in order to see through the materials of the course. An African proverb says 'nothing good is free from having some component which is bad." A1 further dovetailed into the ugly of the experience when he said that: *"EDU 313 is one of the best courses I have ever been engaged in but the ugly in this path is poor electricity supply. To an extent, this poor electricity has limited us to late fulfilment of some objectives of the course. As we have been taught in every class that as teachers we should give no excuse but just find a way out to get it done. These materials are key to fulfilment of this course yet, because I do not have them, it is at a level difficult for me to fulfil these requirements.' The course 'Method course' is very important for every prospective teacher as it opens them to opportunities even on how to integrate ICTs, improvise and deliver the objectives of the course to the learners."*

Another student B1 from the other course "Games and simulation" expresses his excitement (the good) thus: *"the class opened up the actual way of how educational technology facilitates learning and improves performance, it gave me an insight on how to prepare several educational games, cartoons, videos, musics, it helps to know about learners of the present age their characteristics and of course how they learn best, there was a good classroom management and communication between the lecturer and students, the class is always fun and students' opinion is allowed.* The bad experience he had was captured thus: *"we were not able to practice some of the software mentioned earlier in class properly, course requirements and activities scared a lot of students away".* He recounted the ugly part as: *"project work can be technical for students that know less about software, limited time for class activities, internet and electricity needed for the course which are not always available."*

Conclusion and Implication

From the content analysis and the students' report of the good, the bad and the ugly, the most recurring challenge identified is the issue of insufficient Internet access. The Internet and technological resource dearth make it difficult for students to access and attempt assessment given on the google classroom platform. Lecturers would also be unfair to assess the students based on their online presence and participation in the google classroom because of the ugly realities. The good of the opportunity provided by the university for staff and student to enjoy elearning experience is quite impressive and rewarding. However, the bad and the ugly overshadow the good. Despite the university's effort at ensuring a technology-rich institution, this effort is slowly manifesting with efforts of few staff and students tapping the opportunities and benefitting therefrom. Though, if further motivation in terms of facility upgrade is not provided, frustration through the bad and the ugly may mare the good.

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ASSESSMENT OF TEACHERS' SELF-EFFICACY EFFICACY AND GENDER INFLUENCE ON THE UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN 21ST CENTURY

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Abstract

This study examines secondary school teachers' self-efficacy and gender influence on the Utilization of Information and Communication Technologies (ICTs).This study investigates science teachers' self-efficacy and influence of Gender on the utilization of ICT in the use of ICT for teaching and learning. The population for the study involved all the science teachers. The sample for the study consisted of 575 science teachers from Government owned secondary schools in two selected states in the North-central Nigeria. The Instrument used for the study was an adapted questionnaire and the data were collected personally with the help of research assistants. The data collected was analyzed using mean scores and T-test .The outcome of the study showed that science teachers self-efficacy on the use of ICT was highly positive. There was a significance difference between male and female teachers in the use of ICT for teaching. The male had high self-efficacy than the females' counterparts. Thus, female teachers reported less use of ICT in their instruction than male teachers. It was recommended among others that teachers should develop more interest to maintain and improve their skills to make ICT more easier to use for teaching –learning processes. The female teachers need to be given more support , encouragement and be trained to integrate ICT in their instruction to meet demand of 21st century.

Key words – *Information and communication technology (ICT), Self-efficacy, gender*

Introduction

The Nigerian Educational system is failing to adequately equip students with the essential 21st century knowledge and skills necessary to succeed in their academic career. Contemporary knowledge society calls for the 21st century skills for learning, creativity, critical thinking and collaboration in the Information and Communication Technology (ICT).These skills are also crucial for teachers in terms of developing new teaching pedagogy and assessment tools, so as to prepare the citizens to be able to function in this knowledge-driven society (Krokfors & Myllari, 2010).

The level of technological development of a nation measures the level of scientific literacy obtained in that society (Ogunleye, 2001). Hence, science is defined as a body of knowledge, a way or method of investigating, and a way of making judgement in the pursuit of the understanding of nature (Abimbola & Omosewo, 2006). Science is a great enterprise which nations depend on in order to advance technologically. Therefore, it receives much emphasis in education due to its significance and relevance to life and society (Nwagbo, 2008). The basic science subjects comprise Biology, Chemistry, and Physics (National policy on Education (FRN), 2012). Thus, science continues to contribute to human well-being, especially in the areas of medicine, shelter, leisure, security, education, transportation, telecommunications, agriculture and so on (Obianke, 2009 & Oyedeji, 2010).

ICT can be defined as a means of accessing or receiving, storing, transferring, processing, sending ideas, perception or manipulating and transmitting of information through electronic based tools (Fabunmi, 2012). These tools are classified as hardware and software. The hardware includes central processing unit (CPU), monitor, keyboards, and printers, radio,

telephones while the software comprises Microsoft word, excel, Corel draw, Social Sciences Statistical Package (SPSS), Opera Mini and Google chrome among others. These are very essential in the educational development programme hence they are referred to as ICT in education. ICT in education is defined as a comprehensive approach to innovate education systems, methods, and management with the aid of new technology (Abubakar, 2010).

The importance of ICT cannot be overemphasized in our society. It plays a vital role in the development of any nation and it has been an instrument for achieving social, economic, educational, scientific and technological development (Adedeji, 2010). ICT provides innumerable benefits in enriching the quality and quantity of instructional materials accessible to both teachers and learners (Onasanya, 2009).This versatile instrument has the capability not only of engaging students in instructional activities to increase their learning, but helping them to solve complex problems to enhance their cognitive skills.

In spite of the enormous role of ICT in Education, there exist attendant barriers to it usage. Some of these barriers as stated by Peralta and Costa (2007) include poor maintenance and repair culture in which spare parts and technical experts from the manufacturers are imported whenever the technologies breakdown leading to waste of resources, incessant electricity supply, poor infrastructural support base, and time constraints. The revised National Policy on Education (FRN 2009) gave prominence to computer education especially, in the 2004 edition; computer education was made one of the pre-vocational subjects at the basic level of education and a vocational elective at the senior secondary level. This shows the Government's recognition of the pervasive influence of computer technologies in this contemporary age and its commitment to the integration of technology in all its schools.

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Learning process is based on both the structural condition derived from the learning infrastructures and the personal characteristics of the users involved. This invariably means that for effective use of technologies, the users require positive attitudes or a strong sense of efficacy, (personal) belief to grasp the new technology and use it as a means of achieving objectives (Prompt ,1996).

Self-efficacy has to do with a person's belief of his or her capabilities to successfully accomplish a particular task (Delcourt & Powers 1994). In order for teachers to use computers successfully for teaching, they need to have self-confidence in computer related tasks (Compeau & Higgins 1995). The greater people perceived their self-efficacy to be, the more active and longer they persist, the more task that are executed. Self-efficacy affects every facet of human endeavour by determining the beliefs a person hold regarding the ability to affect situations which invariably influence both the power a person actively has to face challenges. **Therefore, an** important construct of self-efficacy has been a parameter for individual's ability to successfully complete a task. It is an individual expression of what one is capable of doing. Self-efficacy is not a static concept, it is continually being actualized in an individual's mind, which Bandura called "mastery experience". For example, if teachers value their interpersonal skills and believe that they are capable of pursuing a goal to its logical conclusion, their self- efficacy in that area will likely contribute to positive goal attainment. In the utilization of ICT, variables such as gender, are important determinants of the rate ICT is used in learning (Schaumburg, Babetos & Antomous, 2008). Thus, gender is defined as social attributes and opportunities associated with being male or female (Daramola, 2011). There is a 'technological gender gap' between males and females, with female subjects falling behind their male peers in ICT utilization (Enochson, 2008; Reimer & Steinmetz, 2007). Studies have shown over the years that males dominate in the use of ICT. Even in a situation where males and females are given equal opportunity, men are more likely to be the main ICT user than women .Similarly, studies concerning teachers' gender and ICT use have rated female teachers' low due to their limited access to computer use, skill and interest .Evidently, male teachers used ICT more in their teaching and learning processes than their female counterparts (Kay, 2009). But other study revealed that gender variable was not a predictor of ICT integration into teaching and learning processes (Peralta & Losta, 2007). Egbert, Paulus and Nakamichi (2002) reported that, teachers gender affects the use of ICT in language teaching and learning while Teo, (2011) found that teachers' gender had no significant effect on ICT integration. Thus, the issue of gender and utilization of ICT is inconclusive.

Statement of the Problem

The 21st century ideas about knowledge and learning demand shifts from the traditional method of teaching to collaborative approach (Bandhana, 2012). Traditional educational environment do not seem to be suitable for science teachers in preparing learners to function or be productive in the work places of today's society .Onasanya, Sheu, Ogunlade and Adefuye (2011) reported that Studies have shown that science teachers' computer literacy level and ICT utilization resources were low. Hence, to achieve effective teaching and learning of science, there should be shift from traditional educational environment to technological advancement that has remain a hope of many decades to come.

The study therefore attempted to examine ICT self-efficacy of teachers in Nigerian secondary schools and to determine the extent to which teachers gender influences ICT self efficacy .The study raised one research question and one hypothesis each.

Research question One

What is teachers' self-efficacy as regards the use of ICT for teaching? And tested the below

Hypothesis One

Ho. There is no significant difference between male and female science teachers in their Self- efficacy on ICT for teaching.

Methodology

The study was a descriptive research type using cross-sectional survey method. Descriptive method describes, finds out and interprets event(s) and idea(s) the way they are without any external manipulation. Descriptive method enables the researcher to describe the situation exactly as they appear. Survey was chosen for this study so as to collect large amount of information about the teachers' beliefs, values, and activities. The study used an adapted questionnaire in collecting data from the respondents.

The total population for this study comprised all the secondary school teachers in government-owned secondary schools in two selected states (Niger and Kogi State). 650 teachers were randomly selected across the state on which questionnaire were administered to out of which 575 were adequately filled and returned analyze the data for the study. Stratified random sampling technique was employed to group the respondents by gender. The instrument employed for this study was a questionnaire adapted online from the previous studies like Bandura, (1997); Cassidy and Eachus (2002) titled Assessment of secondary school teachers' self-efficacy and Gender Influence on the utilization of ICT (ASSTSGIUICT). Items were selected based upon these previous studies as related to Self-efficacy on integration of ICT for teaching.

The instrument consisted of two sections. A and B. Section A was based on Demographic data like the name of the school, gender, age, teaching experience, educational qualification. Section B was made up of 15 items on teachers' self-efficacy. This was to determine teacher's capability in the use of ICT resources for teaching. A 4-point Likert rating scale was employed; Strongly Agree (SA): 4, Agree(A) : 3, Disagree (D) : 2, Strongly Disagree (SD). The respondents were required to respond to items by ticking as applicable.

To ascertain the validity of the research instrument, questionnaire was administered to sample size of 150 teachers in kwara state that was not part of the sample. The reliability of the instrument for this study was carried out using test- re-test method to check the internal consistency of the instrument. The Cronbach's Alpha value yielded 0.83. These values were considered reliable and appropriate for the study. Copies of the questionnaire were administered personally with the help of Research Assistants. Also, the research assistants helped to retrieve some of the questionnaire that could not be completed immediately. In all, 650 copies of questionnaire were administered of which 570 were returned and used for data analysis in the study. Thus, given a 74.8% return rate.

The analysis and interpretation of data obtained through the questionnaire was subjected to both the descriptive and inferential statistics. Percentage was used for the demographic data of the respondents while mean was used to answer research questions 1 using a bench mark of 2.50 was acceptable and below 2.50 was rejected while the Hypothesis was tested using T-test at 0.05 levels of significance.

Results and Discussions

Research Question 1: What is the teachers' Self-efficacy as regards use of ICT for teaching?
The research question was raised to find teachers' Self-efficacy as regards use of ICT in instruction. The researcher analyzed the responses from the items on the questionnaire and the results are as shown in Table 1

Table 1:
Teachers'S elf fficacy as regards the use of ICT

S/N	Basic ICT Operation	Mean(x)	Decision
1.	Successively start the computer.	3.54	
2.	Easily save to a compact disc.	3.33	
3.	Easily switch from sentence case to upper case.	3.24	
4.	Easily operate basic keyboard operations.	3.34	
5.	Successfully print both from offline and online	3.18	
	Grand Mean	3.31	Accept
	Computer Software Application		
6.	Successfully type and edit lesson note in word packages e.g (MS- word).	3.38	
7.	Effectively use formula in spreadsheet for l result computation.	2.96	
8.	Effectively change font style and size while typing on word package e.g. MS-word.	3.24	
9.	Document information of my students using spreadsheet.	2.98	
10.	Save in different typesof MS documents e.g. 97-2003.	3.14	
	Grand Mean	3.27	Accept
	Internet		
11.	Type into tool address bar to surf the web for new instructional resources.	3.20	

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12.	Download useful scientific educational materials from the web for teaching my students.	3.39	
13.	Access my e-mail for up-to-date information.	3.37	
14.	Download important instructional videos for teaching/learning purposes.	3.43	
15.	Send educational resources to my colleagues through e-mail	3.31	
	Grand Mean	3.34	Accept
	Average Mean	3.31	Accept

The result in Table 1 reveals a grand mean of 3.31 was accepted for teachers self-efficacy as regards use of ICT on basic ICT operation, a grand mean of 3.27 was also accepted for science teachers Self-efficacy as regards use of ICT for computer software application and a grand mean score of 3.34 was accepted for teachers Self-efficacy as regards use of ICT based on internet use. This indicates that teachers' Self-efficacy as regards use of ICT for teaching is high with a grand mean of 3.31 which is greater than 2.50 is accepted for teachers' self-efficacy. It is clearly understood from table 1 that with the mean score of 3.5 teachers' Self-efficacy on basic computer operation is very high as they claimed they could successfully start the computer with ease. They also claimed they could easily save to a compact disc, easily switch from sentence case to upper; as well as easily operate some basic keyboard operations with mean scores of 3.33, 3.24, and 3.34, respectively. Meanwhile, print online and offline- pictures, drawing and diagrams had the lowest mean score of 3.18. Furthermore, teachers' computer software application self-efficacy, the average mean score of teachers' Self-efficacy on the use of ICT on table 1 was 3.27. This also translated to 81.75%. With this result, it is postulated that teachers' Self-efficacy on the use of ICT for teaching is highly positive.

Ho1: There is no significant difference between male and female science teachers on their Self-efficacy on ICT for teaching.
To find out whether significant difference exist between male and female teachers on their Self-efficacy on ICT for teaching, Independent sample t-test analysis was employed as shown in Table 2.

Table 2.
Table 2: t-test of Male and Female Teachers' Self-Efficacy on ICT

Gender	No	$\overline{X}$	SD	df	T	Sig.(2-tailed)
Male	325.00	49.92	7.50			
				1239.00	4.68	0.00
Female	250.00	47.56	9.10			

Table 2 reveals that t (1239) = 4.68, p <0.05. The significant value 0.00 on the table is lesser than the 0.05 alpha levels. This means that the null hypothesis was rejected. By implication, the stated null hypothesis was established that there was a significant difference between male and female teachers' Self-efficacy on the use of ICT for teaching. The mean score of male (49.92) teacher is greater than that of the female (47.56) teachers. This showed that the ICT Self-efficacy is in favour of the male teachers.

CONCLUSIONS
The current study has revealed the teachers' level and skill possessed in successful integration of ICT to the instruction in secondary schools. To live effectively in this technological age, some understanding of the basic concepts, principles and application of ICT has become inevitable for everyone. Thus, science teachers are enjoined to show more interest in the Integration of ICT to achieve effective learning outcome. Also, the female science teachers should not be Gender biased or technophobia so as to bridge Gender gap in the integration of ICT for instruction

Recommendations
In view of the enviable role of ICT in teaching and learning of science, it is recommended that:
1. Secondary school science teachers should develop more interest to maintain and improve their skills so as to find the ICT resources more easier to use for instruction
2. Government and policy makers in education should Endeavour to introduce the use of ICT into teacher education curriculum in secondary schools to be used by both teachers and students for instructional purposes.
3. Government and NGOs should organize conferences, trainings, and capacity building Workshops to educate science teachers on the benefits as well as up-date their knowledge on integrating ICT to teaching. This would enhance the teaching of abstract topics that are difficult to teach and comprehend by the students.
4. Further still, science teachers should help themselves and be encouraged by the school authority to make use of ICT resources for instructional purposes .This will enable them to achieve the ICT usefulness, improve and maintain their ICT skills.
5. Female science teachers need to be more encouraged to integrate ICT to instruction so as to bridge the gender gap that exists in the utilization of ICT for instruction.

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SECONDARY SCHOOL FEMALE TEACHERS' SELF-EFFICACY AND INTENTION TOWARDS THE USE OF SOCIAL MEDIA FOR INSTRUCTION

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Abstract

Social media technology has appeared as a fairly recent tool that offers new educational possibilities. This study examined secondary school female teachers' self-efficacy and intention towards the use of social media for instruction. 255 female teachers from the Western Senatorial District of Kogi State participated as samples for the study. Questionnaire was used to gather the data for the study. Research questions were answered using mean scores and percentages while the hypotheses were tested using t-test statistical analysis. The findings of the study showed that: the intention of female teachers towards the use of social media was positive. The hypothesis tested showed there was no significant difference between qualified and unqualified female teachers in their self-efficacy and intention to use social media for instruction. Also, there was no significant difference between experienced and less experienced female teachers' in their self-efficacy and intention to use social media for instruction

Introduction

Social media as an interaction among people in which they create, share and/or exchange information or ideas (Tony, Asta, Minna, and Sirkka, 2008). It introduces substantial and persuasive changes to communication between organizations, communities and individual (Kietzmann & Kristopher, 2011). Social media is a Web-based and mobile applications that allow individuals and organizations to create, engage and share new user-generated or existing content in digital environments through multi-way communication (Deil-Amen, Rios-Aguilar, Davies & Gonzales, n.d). Social media as defined by Bryer and Zavatarro (2011) are technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders. These technologies include blogs, wikis, media (audio, photo, video, text) sharing tools, networking platforms (including Facebook), and virtual worlds (Bryer & Zavatarro, 2011). Social media are classified into six categories by Kaplan and Haenlein (2010) as: Collaborative projects like Wikipedia; Blogs and micro-blogs like Twitter; Content communities e.g. YouTube and Daily Motion; Social networking sites e.g. Facebook; Virtual game-world like World of War-Craft; Virtual social worlds e.g. Second-life.

ICT is thus a powerful tool for providing educational services for both males and females and, most especially, meeting the gender equality goal . Hence, gender gap has reduced over the past years, presently, a greater number of females than males have used internet and Web 2.0 technologies (Yukselturk & Bulut, 2009). Mainstreaming a gender perspective is essential in assessing the implication of any development program, project or policy on men and women as this holds true of the modern ICT (Panth, 2011). Gender is a factor in every aspect of formal, non-formal and informal education and has an impact on all participants: learners, teachers and administrators (Green, 2009).

Statement of the problem

The most popular social networks like Facebook, Twitter and YouTube are adapted by some teachers for educational purposes. Although, these social platforms are known worldwide, they still carry a degree of mistrust for some parents and educational institutions (Laura, 2013). Female participation in social media sites is on the increase though not for educational purposes, but to socialize. Douglas (2011) stated that, social Web is now ruled by oestrogen where women make up over half of all social media users.

Purpose of the Study
1.determine the female teachers' self-efficacy in the use of social media,
2.determine female teachers' intention to use social media,
3.examine the influence of female teachers' qualification on their self-efficacy in the use of social media,
4.determine the influence of female teachers qualification on their intention to use social media,
5.examine the influence of female teachers experience on their self-efficacy in the use of social media
6.examine the influence of female teachers experience on their intention to use social media

Research Questions
1. How competent are female teachers in their use of social media for instructional purpose?
2. What is the intention of female teachers' on the use of social media?
3. Does female teachers' qualification influence their intention to use social media for instruction?
4. Does female teachers' qualification influence their self-efficacy in use social media for instruction?
5. Does female teachers' experience influence their self-efficacy in use social media for instruction?
6. Does female teachers' experience influence their intention to use social media for instruction?

Research hypotheses

Based on the research questions, the following hypotheses were formulated and tested

Ho$_1$ There is no significant difference between qualified and non-qualified female teachers in their self-efficacy in the use of social media for instruction;

Ho$_2$ There is no significant difference between qualified and non-qualified female teachers' on their intention to use of social media for instruction;

Ho$_3$ There is no significant difference between experienced and less experienced female teachers in their self-efficacy to use of social media for instruction;

Ho$_4$ There is no significant difference between experienced and less experienced female teachers on their intention to use of social media for instruction.

Literature Review

Social media is a component of the web 2.0 which was officially coined in 2004 by Dale Dougherty. However, no individual has been credited as the founder of Web 2.0. By the time it was coined, Web 2.0 was already being used without any name (Anderson, 2007). Web 2.0 also referred to as new media technologies – encompass a wide variety of web-related communication technologies, such as blogs, wikis, online social networking, virtual worlds and other social media forms. Olashina (2011) described Web 2.0 as a perceived second generation of web development and design that facilitates communication, secure information sharing, interoperability, and collaboration on the World Wide Web. Social media technology has appeared as a fairly recent tool that offers new educational possibilities, many of them still to be discovered, but it also generates new perils (Olga, 2013).

At this digital age, teaching, learning and various educational activities should revolve around social media. In this vein, a teacher or lecturer as the case may be, can create a Facebook page, which he regularly updates and post assignments, tutorial questions, suggestions for further reading and also receive feedback from the students (Adeyanju, 2012). The Apestaartjaren study showed mainly girls are using social media applications for communicating with friends, uploading photos and editing their own profile on a social networking site, on the contrary, boys are uploading more movies and music and posting more messages on blogs and fora (Apestaartjaren, 2010).

Self-efficacy has a great effect on teacher's use of ICT. Self-efficacy is defined as a belief in one's own abilities to perform an action or activity necessary to achieve a goal or task (Bandura, 1997). In real meaning, self-efficacy is the confidence that an individual has in his/her ability to do the things that he/she strives to do. Thus, teachers' confidence refers both to the teachers' perceived likelihood of success on using ICT for educational purposes and on how far the teacher perceives success as being under his or her control (Peralta & Costa, 2007).

Self-efficacy theory has been used in research concerned with individuals' intentions to use information technology. An individual's perception of their ability to competently use computers is defined as computer self-efficacy, which is concerned with the judgement of what can be done in the future (Player-koro, 2012). It refers to judgements of ability to apply skills to broader tasks, such as promoting education. Thus, computer self-efficacy does not refer to component skills such as using a specific software feature or booting up a computer, but to judgements of the ability to apply one's skills when using technology for broader tasks (Compeau & Higgins, 1995). According to Embi (2007), computer self-efficacy is the measure of a user's confidence to use, understand and apply their computer knowledge and skills. Users with a low level of confidence are less likely to use technology and will typically believe that technology is difficult to use (Cazares, 2010).

Studies have revealed that users self-efficacy in respect to computing technology plays a vital role on acceptance of ICT gadgets as a learning tools (Beas & Salanova, 2006). Usher and Parajes (2008) opined that self-efficacy is a way an individual determines the choices they make regarding the effort, perseverance and anxiety they experience when engaged in a particular task while using ICT gadgets.

Rice (2003) found five broad categories of teacher attributes that appear to contribute to teacher quality. These attributes are;
1.Experience
2.Preparation programs and degree
3.Type of certification
4.Coursework taken in preparation for the profession
5.Teachers own test scores.

Methodology

This study is a descriptive research of the cross-sectional survey type. A researcher-designed questionnaire was used to collect information from female teachers' on their self-efficacy and intention towards use social media for instruction.

Sample and sampling technique

The total population for this study was all Secondary School female Teachers in Kogi State. The target population for this study was all 928 female teachers in senior secondary schools in Western Senatorial District of Kogi State. Three hundred female teachers were sampled using random sampling method. The sample was stratified based on qualification and experience. A total of 146 qualified female teachers were sampled and 109 unqualified female teachers. Also, 153 had teaching experience of five years and above, while 102 had teaching experience of below five years.

Validity and Reliability

To achieve the reliability of the research instrument, the questionnaire was administered on 20 Senior Secondary School Teachers which are not part of the sample. After an interval of two weeks, it was re-administered to the same respondents. The two scores were correlated using Pearson Product Moment Correlation Coefficient, the value obtained was 0.88.

Data Analysis
Research Question 1
How competent are female teachers in their use of social media for instructional purpose?

Table 1:
Teachers' Competence on the Use of Social media

S/N	Self-efficacy	Mean ( ) $\overline{X}$
1.	I can create a social media account	1.83
2.	I can log into my social media account.	1.99
3.	I can identify common icons on social media.	1.99
4.	I can send e-mails to my students using my social media	1.98
5.	I can upload course content using social media	1.98
6.	I can update my course content for my students using social media	1.92
7.	I can sign out of my social media account when not using it.	2.00
8.	I can use common icons on social media.	1.96
9.	I can create wiki where students can contribute thought and experience.	1.73
10.	I can proffer solution, in case of any challenge faced by the students during usage.	1.80
11.	I can create short instructional videos and share with my students.	1.85
	Grand Mean ($\overline{X}$)	1.91

Table 1 shows that item 7 which sought to know if female teachers can sign out of their social media account when not in use has the highest mean score of 2.00. The lowest mean score was 1.73 where respondents were asked if they could create wiki for students to contribute their thoughts. The resulting mean score established that female teachers are less proficient in carrying out these activities. Necessary efforts should be made on the training and retraining of female teacher to become vast and highly proficient in the use of social media. Moreover, resources needed for smooth diffusion and adoption should be made available.

Research Question 2

What is the intention of female teachers' on the use of social media?

S/N	Intention to use Social media	Mean ($\overline{X}$)
1.	I intend to use social media for administrative purposes	2.45
2.	Social media are only meant for making friends therefore, I did not have the intention to use it for educational purposes	1.96
3.	I can learn to use the social media if motivated	2.61
4.	I intend to use social media in my teaching as often as possible.	2.50
5.	I intend to use social media to enhance my students' cooperation.	2.50
6.	I intend using social media for teaching so as to increase my career prospect	2.50
7.	I intend to use social media for teaching to increase my awareness of its uses	2.55
8.	I intend to use social media to enhance my students' collaboration.	2.44
	Grand mean ($\overline{X}$)	2.11

Findings clearly showed that if respondents are motivated to use social media for instruction, they will use it. Items 4, 5 and 6 has a mean score of 2.50 showing that female teachers intend to use social media for their teaching as often as possible to increase their career prospects and also to enhance students cooperation. The result of the mean score showed that the female teachers have good intention to use social media for instruction and if introduced into education, it will be a welcomed innovation by the teachers.

In support of this finding, Adeyanju (2012) reported that the use of technologies had in a large number of cases enhanced either individual or institutional productivity because of inadequate training in new skills and unwillingness by lecturers to learn new skills.

Hypotheses Testing

H_{01} *There is no significant difference between qualified and non-qualified female teachers' in their self-efficacy in the use of social media for instruction*

In determining whether there is any relationship between qualified and non-qualified female teachers in their self-efficacy in the use social media for instruction, data was analysed using t- test as shown in Table 3.

Table 1: Teachers' Self-efficacy based on Qualification

Qualification	No	$\overline{X}$	SD	df	T	Sig. (2-tailed)
Qualified	146	20.93	7.32			
				253	-.307	0.498
Non-qualified	109	21.21	6.99			
Total	225					

Table 3 indicates that t (225) = -0.307, p = 0.498. That is, the result of the t- value of -0.307 resulting in 0.498 significance value was greater than 0.05 alpha level. This means that the stated null hypothesis, there is no significant difference between qualified and non-qualified female teachers on their self-efficacy in the use of social media for instruction was accepted.

H_{02} *There is no significant difference between qualified and non-qualified female teachers' on their intention to use social media for instruction.*

In an attempt to determine whether there is any significant difference between qualified and non-qualified female teachers on their intention to use social media for instruction, t-test was used to test the null hypothesis as shown in Table 4.

Table 4**: Teachers' Intention to use Social Media based on Qualification**

Qualification	No	$\overline{X}$	SD	Df	T	Sig. (2-tailed)
Qualified	146	19.66	3.46			
				253	1.430	0.752
Non-qualified	109	19.06	3.23			
Total	225					

Table 4 indicates that t (225) = 1.430, p = 0.752. That is, the result of the t-value of 1.430 resulting in 0.752 significant value was greater than 0.05 alpha value. This means that the null hypothesis, there is no significant difference between qualified and non-qualified female teachers on their intention to use social media for instruction was accepted.

These findings are in agreement with Oldfield (2010) that reported the reasons why ICT is either adopted or not in schools are complex. There appears to be an interplay between individual factors (e.g., teachers' lack of skills, insufficient training) and wider, system-level factors such as school and national policies and the complexity of integrating ICT into the curriculum.

H_{03}: *There is no significant difference between experienced and less experienced female teachers' in their self-efficacy to use social media for instruction.*

In determining whether there is any significant difference between experienced and less experienced female teachers on their self-efficacy in the use of social media for instruction, the null hypothesis was tested using t-test as shown in Table 5

Table 5: Teachers' Self -efficacy based on Experience

Experience	No	$\overline{X}$	SD	df	T	Sig. (2-tailed)
5 years and above	153	19.35	7.04			
				253	-4.85	0.095
Below 5 years	102	23.61	6.61			
Total	225					

Table 5 indicates that t (225) = -4.85, p = 0.095. This was as a result of the t- value of -4.85 resulting in 0.095. The hypothesis, there was no significant difference in female teachers' teaching experience on their self-efficacy in the use of social media for instruction was accepted.

H_{04} *There is no significant difference between experienced and less experienced female teachers' on their intention to use social media for instruction.*

In an attempt to determine whether there is any significant difference between experience and less experienced female teachers' on their intention to use social media for instruction, t-test was used to test the null hypothesis as shown in Table 6

Table 6: Teachers' Intention to Use Social Media based on Experience

Experience	No	$\overline{X}$	SD	df	T	Sig. (2-tailed)
5 years and above	153	19.32	3.25			
				253	-0.484	0.915
Below 5 years	102	19.53	3.56			
Total	225					

Table 6 indicates that t (225) = -0.484, p = 0.915. That is, the result of the t-value of -0.484 resulting in 0.915 significance value was greater than 0.05 alpha value. This means that the stated null hypothesis, There is no significance difference between experienced and less experienced female teachers on their intention to use social media for instruction was accepted. These findings on qualification agree with the earlier findings of Rice (2003) that the idea of experience gained over time enhances the knowledge, skills, and productivity of workers

Recommendations

Female teachers' should be trained on the use of social media for instruction to enhance their competency; the Government, NGOs and individuals should also make available facilities needed to access social media, either by reducing

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LECTURERS' READINESS TOWARDS THE INTEGRATION OF SOCIAL MEDIA FOR TEACHING IN A NIGERIAN UNIVERSITY

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Abstract
The indispensable presence of social media in the lives students of higher institutions prompted educators to source for mechanism to incorporate social media in education. One of such mechanism is the integration of social media for teaching and learning. As lecturers hold the locus-control over integration of social media for teaching, this study investigated university lecturers' readiness towards the integration of social media for teaching in a Nigerian university. The study adopted a descriptive type of survey and used researchers' designed questionnaire to elicit information from 99 randomly sampled lecturers from 3 faculties of university of Ilorin. The questionnaire consisted of 30 likert scale items with a content validity and 0.83 reliability index after a test re-test pilot was conducted. Weighted mean score was used to answer the three raised research questions. Findings of the study revealed that majority of lecturers are ready to use social media for teaching but not all lecturers are skilled in the use of social media for its integration in teaching. In this vein, the study recommended among others that university management should organize workshops to train lecturers on the use of social media for its integration in teaching.
Keywords: Social Media, Nigerian University, Lecturers, Teaching, Readiness, Integration

Introduction

In recent years, the online world has evolved remarkably, due largely to the innovation of social media, referred to as the reborn of dot.com, the second coming of world wide web (www), and creation of web2.0. Social media presents users astonishing forms to create, share and exchange contents, ideas, feelings, personal information through texts, images, audio and videos on platforms such as facebook, twitter, Instagram, vine, linkedin, whataspp, and so on. Social media started out as a form of fun and leisure tool for youths but its usage has metamorphosed into the realm of political campaign and participation, health awareness and epidemic control, news coverage and reporting, citizen journalism, entertainment promotion, accountability and transparency in governance, brand exposure, small medium enterprise development, humanitarian activities, community development, security operation and intelligence services and so on.

There is no gainsaying that majority of students are predominant users of social media who spend countless hours immersed in social media which some studies revealed causes addiction, procrastination, distraction, destroys learners' spellings and grammatical construction of sentences and poor academic grades (Schill, 2011; Ajewole & Fasola, 2012; Singh & Dwivedi, 2013; Yeboah & Ewur, 2014). In contrast, some other studies revealed that social media build positive relationship among students, facilitate collaborative learning, engage learners and network for learning activities (Echeverría, Nussbaum, Calderón, Bravo, & Infante, 2011). It should be noted that whether social media is used positively or negatively among students, the bottom-line is that it is a platform highly favored for use among students at all levels of education. As it seems, educators are gradually waking up to the reality of social media as an indispensable part of the lives of learners.

This development has piqued the interest of educators who are interested in the integration of social media in education. It placed social media under scrutiny in the field of education to see if it makes provision that would blend pedagogy and technology (Valetsianos & Navarrete, 2012). Studies of Grosseck and Holotescu (2009), Ebner, Lienhardt, Rohs and Meyer (2010), Schroeder, Minocha and Schneider (2010) and Junco, Helbergert, and Loken (2010) recommended the use of social media in education and canvassed for the integration of various social media tools such as blogs, microblogs, video-sharing and social networking sites, and so on, into the teaching and learning process.

In recent times, social media is used as web-based learning at universities and higher educational institutions to enhance online interactions through discussions and to share knowledge between lecturers and learners (Echeverría, et al., 2011).

Lederer (2012) asserted that social media as an educational tool enriches the learning experience by allowing learners and lecturers to exchange ideas, foster collaboration and discussion, and engage and interact using such emerging social platforms. While highlighting the advantages of social media for teaching and learning, Lederer (2012) argued that social media is an effective way to increase student engagement and build communication skills by allowing students to feel more comfortable expressing themselves in a less intimidating environment. Social media can improve communication between students and instructors, while the latter can answer students' questions, post homework assignments and lesson plans, send messages and updates, schedule or announce upcoming events, and share Web sites and multimedia content.

In meeting with contemporary realities in pedagogical, technological developments, and integrative learning needs of students, there is a growing demand to incorporate social media in education to facilitate teaching and learning. In a bid to align with the emerging needs of the 21st century, some departments have taken the bull by the horn and risen to the clarion call. One of such is the Department of Educational Technology, Faculty of Education in University of Ilorin.

University of Ilorin is an institution established in 1975 in Ilorin, Kwara State. The institution presently has 14 faculties and scores of departments offering various programmes to meet the yearnings of undergraduate and postgraduate candidates. The department of educational technology introduced social media as a course at the 3rd and 4th year of Educational Technology programme.

According to the academic programme of University of Ilorin (2016), at the 3rd year of the educational technology programme, students offer Social Media in Education (EDT 326) as a course in the second (rain) semester. This course is of 2 credit unit and elective for the students. The outline of the course is use of social media in education, nature and purpose of social media, types of social media, social media promotion, social media disclosure guidelines, and ethics in educational use of social media. Social Media in Learning (EDT 416) is the title of the course at the 4th year of educational technology programme and it is of 2 credit unit and elective for the students. This course is also offered in the second (rain) semester and students are expected to learn collaborative and emergent pedagogies, tools and theory related to the use of social media in learning environments, hand-on experience with a variety of social media tools, create community of practice for learning, create a community-based resource and have an opportunity to develop a global professional network for educational technologists.

There are numerous examples of the introduction of social media in higher education across the globe (Davis III, Deil-Amen, Rios-Aguilar, Gonzalez Canche, 2012; Lupton, 2014), particularly, in open distance learning (Brady, Holcomb & Smith, 2010; Manan, Alias, & Pandian, 2012). The aforementioned stimulated the need among educators to incorporate social media in education. Most studies on social media and lecturers are either theoretical (Guy, 2012; Lederer, 2012) or centred on lecturers' awareness (Daniels, 2013). Studies have proven that the successful implementation of any educational activity depends largely with the teacher (Kankam, 2013). Thus, this study seeks to fill the gap of university lecturers' readiness towards the integration of social media for teaching, particularly, for an institution that has introduced courses on social media. In this vein, this study examined university lecturers' readiness towards the integration of social media for teaching in a Nigerian university. In order to realise the purpose of this study, the following questions were raised to guide this study:
I. Do lecturers perceive social media to be useful for teaching?
ii. Are lecturers ready to use social media for teaching?
iii. Are lecturers skilled in social media use for its integration in teaching?

Methodology
Descriptive type of survey was employed for this study. All lecturers in University of Ilorin constituted the population, 99 lecturers were randomly sampled across 3 randomised faculties. Two departments each were purposively selected from the randomized faculties of Communication and Information Sciences (Mass Communication and Library and Information Sciences), Education (Educational Technology and Social Sciences Education), Social Sciences (Sociology and Social Work). The instrument used to elicit the needed data from respondents was a 30 Likert-Scale items researchers' designed questionnaire with content validity as well as 0.83 reliability index after a test re-test pilot was conducted. Research Question 1 (*Do lecturers perceive social media to be useful for teaching*?) was answered with the information gathered from the respondents on 10 items of the questionnaire on lecturers' perceived usefulness of social media for teaching. The data gathered was analysed with weighted mean score and the result of the analysis was presented in Table 1.

Table 1.
Lecturers' Perceived Usefulness of Social Media for Teaching

S/N	ITEMS	No	MEAN	Rank
1.	The use of social media would enhance my teaching effectiveness	99	3.33	1st
2.	Social media use would make my teaching more interesting	99	3.33	1st
3.	I would find social media useful for my teaching	99	3.30	3rd
4.	The use of social media would improve my performance as a lecturer	99	3.21	4th
5.	I would find social media easy to use for my teaching	99	3.15	5th
6.	I would find social media flexible to actualize my teaching objectives	99	3.15	5th
7.	Social media would enable my teaching to be dynamic and methodical	99	3.09	7th
8.	Using social media would enable me to accomplish my teaching task	99	3.06	8th
9.	Social media use would make my teaching more fun	99	3.00	9th
10.	My interaction with students via social media will make my teaching clear and understandable	99	3.00	10th
	Weighted Mean Score		**31.62**	

Table 1 illustrates that 99 respondents participated in this study. The benchmark weighted mean score stood at 25.00 and the mean score for the responses on lecturers' perceived usefulness of social media for teaching is 31.62 which gives a positive indication. This implies that majority of lecturers' perceived social media to be useful for teaching.

Research Question 2 (*Are lecturers ready to use social media for teaching*?) was answered with weighted mean score on the basis of the information gathered from the respondents on 10 items of the questionnaire on lecturers' readiness to use social media for teaching. The output of the analysis was revealed in Table 2.

Table 2.
Lecturers' Readiness to Use Social Media for Teaching

S/N	ITEMS	No	MEAN	Rank
1.	I will like to learn about social media use for teaching and learning	99	3.30	1st
2.	Social media will help my students to catch up and revise the topics we learn	99	3.24	2nd
3.	I am prepared to know more about what I can use social media for	99	3.24	2nd
4.	Use of social media will enhance my teaching	99	3.18	4th
5.	I see myself using social media for my teaching	99	3.18	4th
6.	I will like to use social media to teach when I have the opportunity	99	3.18	4th
7.	I am interested in using social media for teaching	99	3.15	7th
8.	I am eager to give assignments to my student on social media	99	3.09	8th
9.	All my students will learn through social media	99	2.52	9th
10.	I am not willing to use social media to support my teaching	99	2.00	10th
	Weighted Mean Score		**30.08**	

Table 2 indicates that 99 respondents participated in this study. Responses to items that sought information on the lecturers' readiness to use social media for teaching was positive because the weighted mean score was 30.08 which is higher than the benchmark weighted mean score of 25. This implies that majority of lecturers are ready to use social media for teaching.

Respondents provided information on 10 items of the questionnaire on lecturers' skilled in social media use for its integration in teaching to answer research question 3 (*Are lecturers skilled in social media use for its integration in teaching?*). The result of the analysis was revealed in Table 3.

Table 3:
Lecturers' Skilled in Social Media Use for its Integration in Teaching

S/N	ITEMS	No	MEAN	Rank
1.	I can communicate effectively with my students via Facebook/Whatsapp/Twitter	99	3.27	1st
2.	I have enough competency in the use of mobile phone for teaching	99	3.03	2nd
3.	I can send and download students' assignments from my email	99	3.03	2nd
4.	I can interact with my students via Skype	99	2.94	4th
5.	I can upload my lecture tutorial to Youtube	99	2.88	5th
6.	I can upload assignment to my students using various social media platforms	99	2.85	6th
7.	I can have group discussion with my students using blogs/whatsapp	99	2.82	7th
8.	I can upload and share my lecture presentations using SlideShare	99	2.79	8th
9.	I can create a podcast for teaching my course(s)	99	2.67	9th
10.	I know how to use several social media platforms to teach	99	2.36	10th
	Weighted Mean Score		**28.29**	

99 participants responded to these 10 items to answer research question 3 as revealed in Table 3. The weighted mean score was 28.29 for responses on lecturers' skilled in social media use for its integration in teaching which was higher than the benchmark weighted mean score of 25.00, hence, the responses can be adjudged to be positive. However, unlike the previous Tables 1 and 2 which weighted mean score were 31.62 and 30.08 respectively, the less than 30.00 weighted mean score in Table 3 shows that substantial number of lecturers are not skilled in social media use for its integration in teaching. This implies that not all lecturers are skilled in social media use for its integration in teaching.

Summary of the Findings
1. Majority of lecturers are ready to use social media for teaching.
2. Majority of lecturers perceive social media to be useful for teaching.
3. Not all lecturers are skilled in social media use for its integration in teaching.

Discussion of Findings
Finding of this study revealed that majority of lecturers perceive social media as useful for teaching. This is in consonance with Hamid, et al. (2011), Manan, et al. (2012), Seaman and Tinti-Kane (2013) who found that faculty are using social media to facilitate teaching and learning, a participatory culture, engagement and interaction among students. Carrigan (2014) and Miah (2014) found benefits and possibilities of using social media as part of academic work. Lederer (2012) asserted that social media improves communication between students and lecturers while the latter can answer students' questions, post assignments and lesson plans, send messages and updates, and share multimedia contents. Velestsianos and Navarrete (2012) added that social media for teaching provides opportunities for students' self-expression, self-reflection, and social interaction.

Another finding of this study indicated that majority of lecturers are ready to use social media for teaching. This aligns with the findings of Hamid, Waycott, Chang and Kurnia (2011) and Lutpton (2014) that majority of academic staff of higher institutions were very positive about using social media for teaching. Seaman and Tinti-Kane (2013) found a substantial percentage of academics who use social media for teaching purposes. Basically, there is a growing interest and readiness among lecturers to use social media for teaching. According to Lupton (2014), Twitter, Academia.edu, Personal blog, Facebook, Linkedin, Online referencing tools, Youtube, Multi-authored blog, Google+ and Slideshare are the top 10 social media platforms lecturers found comfortable to use for teaching.

The last finding of this study revealed that not all lecturers are skilled in social media use for its integration in teaching. This finding was in line with Fransman (2013) who discovered in a British study that majority of academics do not use twitter for teaching because they lack its proficiency, hence, did not venture to try it. This explains the reason few lecturers have taken up the use of social media in teaching and the slow integration of social media in teaching. As there exists a substantial number of lecturers who are not adequately skilled in social media use for teaching, it presents a setback for the integration of social media in teaching. By so doing, Grosseck (2013) observed that there is a need for training of educational actors in the use of social media for its integration in teaching.

Implication
The undeniable presence of social media in the lives of learners has led educators to examine its use for teaching and learning. This study has shown that lecturers find social media useful for teaching and are interested in using social media for teaching. The readiness to use social media for teaching as expressed by lecturers of University of Ilorin justifies the introduction of social media courses at the 3rd and 4th year of educational technology programme of the Department of Educational Technology, Faculty of Education, University of Ilorin. The promise social media holds for education cannot be overstated despite the never-ending debate on its positive and negative influence. In this vein, social media is now regarded as an educational medium to blend informal learning into the formal environment of learning. This study has contributed to an emerging knowledge on the integration of social media in education and it has added empirical evidence on the demands and direction of higher education.

This study concluded that the lack of requisite skills in social media use for teaching among some lecturers underscored its fragile and lukewarm integration for teaching and learning. This probably explains the reason some undergraduate programmes such as social studies education, social work, mass communication, sociology, and so on, in various departments in University of Ilorin and other universities in Nigeria are reluctant to introduce social media as a course to be offered by the students. In this vein, this study recommends the following:

1. Adequate training of lecturers in the use of social media for teaching to facilitate collaborative and social learning.

2. The readiness of lecturers to use social media should be stimulated with the review of undergraduate programmes in the Faculties of Communication and Information Sciences, Education and Social Sciences such as social studies education, mass communication, sociology, political science, social work, sociology, and so on, for the possibility of introducing social media as a course to advance pedagogy of this technological phenomenon.

3. Universities should promote academic research on other suitable social media platforms for academic practice such as submission of assignments, term papers, review sessions, tutorials and collaborative learning.

4. Researchers should see this study as an avenue to further studies on the relationship between social media and education

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PERCEPTION OF ECONOMICS UNDERGRADUATE ON NON-USAGE OF UNIVERSITY'S ICT PLATFORM IN TEACHING ECONOMICS IN UNIVERSITY OF ILORIN

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Abstract
This study investigated the perception of economics undergraduate on non-usage of university's ICT platform in teaching economics at the University of Ilorin. Descriptive research of survey type was adopted in this study. The population of this study consists of all Economics undergraduate in the departments of Economic and Economics Education (of the social sciences education department) which is estimated at 937 students. A sample of 278 respondents was drawn randomly in this study. A Researcher's Designed questionnaire with psychometric properties of content validity and 0.71r was used to elicit the needed. Data collected were analysed with descriptive statistics of frequency counts, percentages, means and standard deviation while the hypotheses formulated were tested using inferential statistics of t-test and ANOVA at 0.05 alpha level. The study revealed that lecturer's philosophy, lack of appropriate skills, incompatible classroom environment, limited lecture hours and non-satisfaction with ICT results, among others are perceived as reasons for non-usage of ICT platforms for teaching economics. The study, therefore, recommended that the use of visual Google classroom at all levels of the teaching by the university administration should be encouraged.
Keywords: *Perception, Reasons, ICT Platforms and Non-Usage.*

Introduction

The emergence of technologies for learning, conversation media and smart interface, Open Educational Resources (or Massively Open Online Courses) and increased awareness of "New Generation" have been demanding traditional education and learning systems to be more open, flexible, and customised to what students want to expect. Using ICT in education has been widely accepted as an effective way of challenging such changes attributed to technological advances, societal paradigm shift, and internationalisation. It is based on the strong belief that the potential of ICT would bring positive impacts to teaching and learning by providing students and teachers with flexibility, accessibility, more opportunities for participation and collaboration, and more outcomes.

Now is the right time to respond to a simple but a critically important question, "what should be done to fully exploit valuable resources for better education in the future?" It would be to use all resources in a smart way to maximise their potentials to meet the different perspectives on ICT from stakeholders: teachers, students, and academic institutions. It is in response to this that the University of Ilorin under the leadership of Professor Abdulganiyu Ambali, decided to make available to all students of the instruction for four years a tablet. This is considered to be very portable, internet access and also subscribe to Google Apps platform where both lecturers and students are accommodated to effectively carry out their teaching and learning the process. But one question anybody will ask today is how well are lecturers exploring this platform to teach their students?

This is because changes in technology, demography, and internationalisation are driving education system to evolve to an open flexible education (or learning) environment which provides learners with quality services encompassing formal, informal, and non-formal education. To this regard the "Learning for the Future (LFF)" project recently initiated by UNESCO IITE is a comprehensive approach to integrate ICT in education, renew pedagogy, and enhance learning now and the future, which ensures teachers and students effective use of technologies and resources in strengthening the four pillars of learning for the 21st century: learning to know, learning to do, learning to be, and learning to live together.

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Perception of Economics Undergraduate on Non-usage of University's ICT Platform in Teaching Economics un University of Ilorin

ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005). In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability must find include ICTs in the global village.

Conventional teaching has emphasised content. For many years the course has been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favouring curricula that promote competency and performance. Curricula are starting to emphasise capabilities and to be concerned more with how the information will be used than with what the information is. Contemporary ICTs are able to provide strong support for all these requirements and there are now many outstanding examples of world class settings for competency and performance-based curricula that make sound use of the affordances of these technologies (Oliver, 2000). The use of information and communication technologies can help revitalise teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a tool. According to Zhao and Cziko (2001), three conditions are necessary for teachers to introduce and use ICT into their classrooms or teaching: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology. However, research studies show that most teachers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potential quite significantly (Smeets, 2005). Harris (2002) conducted case studies in three primary and three secondary schools, which focused on innovative pedagogical practices involving ICT. Harris (2002) concludes that the benefits of ICT will be gained "…when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT. As a consequence, the use of ICT will not only enhance learning environments but also prepare next generation for future lives and careers (Wheeler, 2001). The changed pool of teachers will come changed responsibilities and skill sets for future teaching involving high levels of ICT and the need for more facilitative than didactic teaching roles (Littlejohn et al., 2002).

According to Cabero (2001), "the flexibilization time-space accounted for by the use of ICT in teaching and learning processes contributes to increasing the interaction and reception of information. Such possibilities suggest changes in the communication models and the teaching and learning methods used by teachers, giving way to new scenarios which favour both individual and collaborative learning". The use of ICT in educational settings, by itself, acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (Reeves & Jonassen, 1996), the influence of the technology on supporting how students learn will continue to increase.

In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve the desired learning outcome. Typically these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of knowledge transmission (Duffy & Cunningham, 1996). In this domain, learning is viewed as the construction of meaning rather than as the memorization of facts (Lebow, 1993; Jonassen & Reeves, 1996). Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student-centered settings and by enabling learning to be related to context and to practice (Berge, 1998; Barron, 1998). Students enjoy learning, and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important of 21st-century skills which they will need in their future lives.

Many variables may account for reason lecturers find it difficult to adopt the use of ICT for their lecturers in higher institutions, some which are: government, environmental, lecturers, students and lastly parents various (Zhao & Cziko, 2001). In the work of Susman (1998) it was revealed that Lecturers' variable factors influence their attitude and use of ICT in teaching negatively. Tedla (2012) and Tay, Lim, Lim and Ling-Koh (2012) confirm that lecturers use ICT tools in order to make the lessons more interesting and engage learners according to learners' potentials. Also in the study conducted by Flecknoe (2002), the finding revealed 67.5% of respondents' perceptive teachers level of teaching experience determines the extent to which lecturer uses modern technologies in delivering instructions in the classroom.

For instance, it was an acclaimed number of years of classroom experience reduces certain teachers' beliefs because experienced lecturers were more likely to believe that classrooms should be lecturers' centred and that learning did not always need to be fun". Teachers' age, their level of computer experience and they are lent of years spent at pre-service was and perceived as having serious influence ICT integration (Teo, 2008).

If students are asked to comment on the state or quality of teaching they received without the use of ITC platform provided by the school to them despite their assess to Tablet Portable Computer and Wi-fi, they are likely to differ in their reasons for non –usage of ICT by their lecturers. This is because the *International Encyclopaedia of Social Sciences*, (1992) defines perception as the process by which one comes to know and think about others and their work, characteristics, qualities, roles and functions in the society. It adds that when several individuals confront an object or a thing in their environment, the input of information that impinges on their respective sense organs (e.g. eyes and ears) is the same for every individual, though they may perceive it differently. In Hornby's (1991) view, perception is believed to be the ability to show understanding and insight, to be able to notice and have discernment about a situation. Similarly, Miller and McCracken (1988) posit that perception is the ability of a person to know about his environment through the use of his sense organs which must be very active. Various explanations can be offered as to why the individuals perceive the same thing differently, even when they are confronted with the same stimulus. *The Encyclopedia Britannica* (1997) identifies some variables as responsible for differences in the perceptual functioning of an individual, age, status, gender, among others.

The gender of an individual is considered an important factor that influence perception in not–usage of University ICT platform in the teaching of economics in the University of Ilorin, due to the differences which male and female members of these areas experienced. The positions an individual occupies in the society also influence their perception of issues and situation (status). Perception is the mental function of giving significance to stimuli such as shapes, colour, movement, taste, sounds, touch, smells, pains, pressures and feeling. Perceptions give rise to individual behavioural responses to particular situations.

Statement of the Problems

Study has shown that an estimated percentage of University lecturers do not explore the ICT platforms available for them, in order to make teaching and learning more meaningful. This cut across all the faculties and departments, with exception of few departments. This became a source of concern to the school administration which calls for a meeting held with the academic staff of the university trying to create awareness of facilities available to on the university ICTs platform for effective teaching and learning process. Thus, series of workshops, training and re-training of academic staff of the university by the Centre for Research Development and In-House (*Credit*) on the use of some of the facilities made available for lecturers on the internet such as Google App classroom. Also the Institute of Education organized a Training workshop titled "*Migration of M.Ed. Sandwich programme to E-learning Platform.*" All these aimed at exposing lecturers to the integrate ICTs platform available for them to use in class. But up till now students portable tablets have not been put into proper use, since lecturers are not taking them up on how best to use it for learning possess. Report of economics undergraduate affirm that out of many courses undergraduate under takes in department only two has ever explore ICT to teach STATA software and sharing of software textbooks for two micro economics courses briefly. A cursory look at the table of performance of economics undergraduate revealed thus:

Table 1:
Performance of Economics Undergraduates over three Academic Sessions

Academic Session	% Passed	% Failed
2013/2014	84.95	15.05
2014/2015	88.27	11.73
2015/2016	92. 86	7.14

Source: Data Base of University of Ilorin 2017

Bello, M.B., Yusuf, A., Amali, I.O.O., Daramola, D.S. & Adegoke, A. K.

Perception of Economics Undergraduate on Non-usage of University's ICT Platform in Teaching Economics un University of Ilorin

The above table shows a positive trend of the performance of students over the three academic sessions of the introduction of Portable Tablet Pc for students. This shows that despite non-usage of University ICTs platform economics undergraduates have been performing very well. But in order to compete favourably with global best practices, there is the need for a paradigm shift. Not only to better performance but also to make learning more flexible. In the lieu of this, the paper seeks the perception of Undergraduate Economics students on non-usage of University ICT platforms for teaching Economics courses.

Purpose of the Study

The main purpose of this study was to investigate the perception of undergraduate Economics of non-usage of university's ICT platform in teaching economics at the University of Ilorin. Specifically the study:

1. examine the perception of undergraduate economics on non-usage of university's ICT platform in teaching economics at the University of Ilorin.
2. ascertain whether there is the difference in the perception of undergraduate economics on non-usage of university's ICT platform in teaching economics at the University of Ilorin on the basis of gender.
3. ascertain whether there is the difference in the perception of undergraduate economics on non-usage of university's ICT platform in teaching economics at the University of Ilorin on the basis of the level of their education.

Research Questions

The following questions were raised to guide the study.

1. What is the perception of undergraduate economics on non-usage of university's ICT platform in teaching economics at the University of Ilorin?

2. Is there the difference in the perception of undergraduate economics on non-usage of university's ICT platform in teaching economics at the University of Ilorin on the basis of gender?

3. Is there a difference in the perception of undergraduate economics on non-usage of university's ICT platform in teaching economics at the University of Ilorin on the basis of level?

Research Hypotheses

The following formulated hypotheses were tested in this study.

Ho_1 There is no significant difference in the perception of male and female undergraduate economics on non-usage of university's ICT platform in teaching economics at the University of Ilorin.

Ho_2 There is no significant difference in the perception of undergraduate economics on non-usage of university's ICT platform in teaching economics in University of Ilorin on the basis of the level of their education.

Methodology

Descriptive research of a survey method was employed in the study. The choice of the descriptive survey was in line with Akuezuilo and Agu (2003), who maintained that it is concerned with a gathering of information on peoples' opinion. The population for the study consists of all Undergraduates' of Business and Social Sciences faculty while the target population were the Economics Department, Faculty of Business and Social Sciences, University of Ilorin. Purposive sampling technique was used to select Economics Department which comprises of 937 students. Proportionate sampling technique was used to draw 278 respondents based on required sample size as stipulated in The Research Advisors (2006) table for sample selection. See table below:

Table 2:
Sample Size Selection of Economic and Economics Education Students

Level	Population	Sample Selected
100	283	84
200	194	58
300	203	60
400	257	76
Total	937	278

Source: (Faculty of Education and Faculty of Social Sciences' IT Office, 2017)

The instrument used for the collection of data was a researcher-designed questionnaire, which was tagged "Perception of Undergraduate on Non-usage of ICT Platform in Teaching Economics Questionnaire (PUNIPTEQ) with psychometric properties of contents validity and reliability index of 0.71. The questionnaire was divided into two sections 'A' and 'B'. Section 'A' contains demographic information of the respondents like Gender and Educational Level while section B consists of items that elicit information on perception of economics undergraduates on non-usage of ICT in Teaching Economics. The questionnaire was structured on four points Likert-type scale as thus: SA- Strongly Agree; A- Agree; D- Disagree; SD- Strongly Disagree. The coding of the questionnaire was SA = 4; A = 3; D = 2; and SD = 1. The data collected were analysed with the use of descriptive statistics of frequency count, percentage, mean and frequency count answer the only research question, while the two hypotheses formulated, was tested using t-test (t) and ANOVA (F) inferential statistics at 0.05 level of significance.

Results

Research Question One: What is the perception of economics undergraduate on non-usage of university's ICT platform in teaching economics in University of Ilorin?

Table 3:
Responses on perception of non usage of ICT platform in teaching economics

Items	SA (%)	A (%)	D (%)	SD (%)	Std.	Mean
The irregular power supply is considered as one of the reasons why some economics lecturers do not use ICT platform for teaching.	71 (25.5%)	112 (40.3%)	52 (18.7%)	43 (15.5%)	1.00	2.76
Lack of awareness of economic lecturers about available ICT platforms in the university cont ributes to non -usage of ICT platform for teaching.	24 (8.6%)	79 (28.4%)	129 (46.4%)	46 (16.5%)	0.84	2.29
The process of setting up ICT platform for lectures is time -consuming to some senior lecturers.	49 (17.6%)	147 (52.9%)	70 (25.2%)	12 (4.3%)	0.76	2.84
Fluctuation in the university's WiFi's connection jeopardises lecturers' interest in using ICT platform for teaching.	81 (29.1%)	127 (45.7%)	51 (18.3%)	19 (6.8%)	0.87	2.97
Incompatible classroom environments to cater for needs of instructors contribut e to non -usage of ICT platform for teaching.	72 (25.9%)	147 (52.9%)	44 (15.8%)	15 (5.4%)	0.80	2.99
Insufficient equipment also hampers usage of ICT platform for teaching among economics lecturers.	90 (32.4%)	136 (48.9%)	40 (14.4%)	12 (4.3%)	0.80	3.09
Lack of appropriate skills and knowledge in using computers hindered integration of ICT platforms for teachings among lecturers.	71 (25.5%)	131 (47.1%)	58 (20.9%)	18 (6.5%)	0.85	2.92
Lecturers' philosophy regarding appropriate teaching methods determined whether and how they used ICT platforms for teaching.	85 (30.6%)	136 (48.9%)	47 (16.9%)	10 (3.6%)	0.79	3.07
Inadequate staff development opportunities hinder some lecturers from using ICT platforms for teaching and learning purpose.	54 (19.4%)	139 (50.0%)	74 (26.6%)	11 (4.0%)	0.77	2.85
Some economics lecturers are not satisfied with the result of the usage ICT platform in teaching economics.	50 (18.0%)	120 (43.2%)	87 (31.2%)	21 (7.6%)	1.39	2.78
Students attitude towards plagiarising answers through th e internet may	49 (17.6%)	147 (52.9%)	61 (21.9%)	21 (7.6%)	0.81	2.81

Source: Field Survey, 2017. *Mean ≥2.5 = Agreed, Mean< 2.5 = Disagreed*

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Responses from table 3 showed that the mean of all the items is 2.5, which means that the respondents perceptive all the items as reasons for non-usage of University ICT platform by lecturers on Economics Department.

Hypotheses One: There is no significant difference between the perception of male and female economics undergraduate on non-usage of university's ICT platform in teaching economics in University of Ilorin.

Table 4
t-test of Respondents

Gender	N	Mean	Std. D	t- cal	df	p-value	Decision
Male	148	39.69	4.82				
				0.468	276	0.640	Do Not Reject
Female	130	39.42	4.87				

P>0.05

Table 4 reveals that t-value is 0.46 with significant probability value (P-value) of 0.64. Since the probability value, P-value = 0.64 > 0.05 alpha level, the null hypothesis is therefore not rejected. This implies that no significant difference existed in the perception of economics undergraduate on the basis of their gender.

Hypothesis Two

H_{o2}: There is no significant difference in perception of undergraduate economics students on non-usage of university's ICT platform in teaching economics in University of Ilorin based on level

Table 5 :
ANOVA table respondents perception based on level

	Sum of Squares	df	Mean Square	F	Sig.	Decision
Between Groups	495.628	3	165.209			
Within Groups	5992.574	274	21.871	7.554	.000	Significant
Total	6488.201	277				

P<0.05 level

Table 5 shows that F-value is 7.55 with significant probability value (P-value) of 0.00. Since the probability value, P-value = 0.00 < 0.05 alpha level, the null hypothesis is rejected. This implies that significant difference existed in the perception of undergraduate economics students on non-usage of university's ICT platform in teaching economics in University of Ilorin across all levels. This was evident in the Post- Hoc Test where variance existed in the different groups of respondents that are, the Economic undergraduate of 100, 200, 300 and 400 levels respectively.

Discussion of Findings

This study has investigated the perception of undergraduate economics students on non-usage of ICT platform for teaching economic in the University of Ilorin. This study has revealed the perception of the student about non-usage of ICT platforms for teaching among which is inadequate power supply as perceived by the majority of students. Also, students believed that process of setting up ICT platform for lectures is time-consuming to some senior lecturers. Furthermore, the opinion of students signifies the fact that fluctuation in the university's Wi-Fi connection jeopardises lecturers' interest in using ICT platform for teaching and those incompatible classroom environments make it impossible for utilisation of ICT in some situations by lecturers. This finding corroborates that of Lewis and Smith (2002) which revealed the barriers for ICT adoption as follows: limited equipment in the school/ classroom, inadequate skills, minimal support from the school administration, time constraints and the teacher's own lack of interest and belief in the effectiveness of ICT.

Lack of appropriate skills and knowledge in using computers is another factor that was found out to be the hindering integration of ICT platforms for teachings among lecturers, students also perceived lecturers' philosophy regarding appropriate teaching methods determined whether and how they integrate ICT platforms into their teaching. This is in line with Agbamu (2004) whose study revealed that lack of appropriate skills in the use of ICT is one of the determinants of lecturer failure to integrate ICT into their teaching. Also, Ololube, Umunadi and Kpolovie (2014); Kpolovie and Obilor (2013) study's shared the same result by revealed that in Nigeria today, lecturers non-usage ICT services for reasons such as lack of interest, lack of awareness, outrageous rate of service, poor quality of internet service and epileptic power supply. The study also revealed that students' attitude towards plagiarising answers through the internet may discourage frequent integration of ICT into lecturing while in the same vein, it was brought to a height that increases the level of absence in the classroom by sharing courseware on Google drive hamper usage of ICT platform for teaching.

The finding of the study also found that there was no significant difference in the perception of economic undergraduates on non-usage of university ICT platform by their lecturers on the basis of gender. This means that the respondents perceived reasons for non-usage the same way. This could be because all the respondents were exposed to the same teaching and learning situation which could influence them to believe, behave, or feel the same way about issues and challenges. This is confirming the findings of Hall and Langton (2006) who found out that the situation which an individual is exposed to can determine or influence his/her level of perception either positively or otherwise. Thus, this could account for why there was no significant difference in their perception.

While significant difference existed in the economic undergraduate's perception on the basis of their educational level. This difference could be as a result of the grouping which respondents belong (100, 200, 300 and 400 level) as well as the characteristics of each group of respondents. This finding is in agreement with the finding of Samar, Azimi and Dadvand (2007) on socioeconomic status and class perception. Their study reveals that differences existed in the perception of people in the society on the basis of their socioeconomic status, even if they are exposed to the same condition.

Conclusion and Recommendations

In conclusion, how economics undergraduates perceived the non-usage of University ICTs platform for effective teaching do not differ on the basis of their gender but differ on the basis of their educational level (100,200,300 and 400 level). The following recommendations were drawn:
1. Lecturers should try as much as possible to integrate every relevant university ICTs to maximum use to teach.
2.The university administration should entry into Memorandum of Understanding (MoU) with software package producers for have access to more software for lecturers to use.
3. There should be adequate provision of facilities and equipment that will enhance using of ICT for teaching economics in University of Ilorin.
4. Encourage the use of visual Google classroom at all levels of the teaching by the university administration.

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INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN THE OPEN DISTANCE LEARNING IN THE 21ST CENTURY NIGERIA

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Abstract
Open and distance education (ODE) is the teaching and learning process in which students are separated from the teachers by a physical distance which is often bridged by communication technologies. It incorporates a variety of media and technologies to ensure that quality education is given to a larger number of learners irrespective of their age, sex, tribe and location. The integration of information and communication technology (ICT) in ODE is all about transforming the methods, means and technique by which education is provided and accessed by learners. The integration of ICT in ODE entails the use of media with high interactivity, that is media which can promote both teacher-student and student-student interactions. The nature of ODE and the need to provide opportunity for a learner to interact with instructors and other learners makes it necessary for the integration of ICT which can help foster effective delivery. This paper examines the concepts of ODE and ICT. The different ways ICT can be utilized in ODE and the challenges of using ICT application are discussed. Finally, some suggestions on how to improve the integration of ICT in ODE are made.

Introduction

Open and distance education is not new in Nigeria, its origin could be traced back to the colonial era. Comet Newspaper (2002) asserts that, banished Emirs from Northern States used distance education techniques to keep regular contacts with their respective subjects at home. Tait (2003), also agreed with Bell and Tight (1999) that the University of London was the first Open University, which made students all over the world to look for tutorial support to supplement the bare syllabus which they received on registration. Omolewa (2003) noted that Nigerians enrolled for the first time in the University of London Matriculation Examination as external candidates as far back as 1887.

Many other institutions served the Nigerian populace that was eager to get quality education until 1976 when the department for correspondence courses was established in University of Lagos as a follow up to the Ashby report on higher education in 1960. However, the emergence of National Teachers' Institute (NTI) distance learning in 1976 marks a turn around to distance education.

As noted by Onuorah (2007), the coming on board of NTI, distance learning program made correspondence education in Nigeria to stop. But the interest of the federal government in open and distance education was brought back to light in 1983 when the national open university of Nigeria (NOUN) was establishedand rekindled in 2002 by Obasanjo administration

Open and distance education is a major way of providing quality access to basic and tertiary education for millions of citizens. The objectives of open and distance education in Nigeria as stated in the National Policy on Education (2009) include:
- Providing access to quality education and equity in educational opportunity for those who otherwise would have been denied.
- Meeting special needs of employers by mounting special certificate courses for their employers at their workplace.
- Encouraging internationalization especially of tertiary education curricular.
- Ameliorating the effect of internal and external brain drains in tertiary institution by utilizing Nigerian experts as teachers regardless of their location or workplace.

If Nigeria will realize these objectives, there is great need for continuous use of modern technologies, especially information and communication technology in open and distance education. According to Yusuf (2006), distance education program is dependent on good information and communication for successful learning.

He also maintained that this is because interaction is essential to students' learning and to the overall success and effectiveness of distance learning. In the words of Akpan (2008), the traditional method of managing distance education and transmitting knowledge and skills through print materials that were self-instructional is gradually giving way to internet-based materials. He maintained that Nigeria cannot achieve quality in open and distance learning without sound knowledge of information and communication technology. ICT is viewed as a factor that can enhance quality in the operation of open and distance education. According to Johnson (2007), without effective communication, the education process is hampered. Hence in order to ensure quality in the education delivery via open and distance learning, the issue of integration of ICT must be adequately addressed.

Meaning and Nature of Open and Distance Education

Scholars have defined open and distance education in different ways. Dhanayaran (2001) defines it as the means by which the teacher is taken away literally from the student. Perraton (2001) sees it as an educational process in which a significant proportion of the teaching is conducted by "someone" and the learner is therefore necessarily provided for by different means of communication and instruction. Also, Glen (2005) identifies open learning as policies and practices that permit entry tolerating with little or no minimum barriers with respect to age, gender or time constraints and with recognition of prior learning. According to Yusuf (2006), distance education means the delivery of useful learning opportunities at convenient place and time for learners irrespective of the institution providing the learning opportunity.

One can therefore sum up that ODL is a very flexible and accessible means where by one irrespective of age, sex or work type can confidently acquire education. It is characteristically different from the conventional mode of education. Open and distance education is therefore a departure from the traditional method of education. Though distance education shares the goals of conventional education, it also aims at providing access to historically under-served, place-bound and highly-motivated population. Contacts between the students and institutions are provided through interactive and non-interactive media (Yusuf, 2006). Akpan (2008) maintained that though distance education emphasizes independent study as a way of liberating the learners from the fetters of school routine, it does not imply self-study because of the two way communication. This suggests that the separation of the teacher from learner in time and space does not mean complete communication cut-off. As such, open and distance education is a formalized teaching and learning system specifically designed to be carried out remotely by using a variety of media and technology for instructional delivery (Akpan, 2008).

The Concept of Information and Communication Technology

Information and communication technology which has completely revolutionized the entire world started as information technology (IT) which deals with the aspect of managing and processing information through the use of electronic computers and computer software to convert, store, protect, process and transmit and receive information (Akpan, 2008). According to Onuma (2007) in Akpan (2008), information technology is focusing on electronic generation, storage, retrieval, utilization and protection of information for future use. The national policy on information technology (NPFI) (2010) describes information technology as computer, auxiliary equipment, software and firm way and procedures, services and related resources. The knowledge of ICT is now widely incorporated into many areas including education.

Information and communication technology is a process of creating, processing, storing, retrieving and disseminating information and data using computers and telecommunications. It allows electronic communication through facsimile, e-mail, voice mail, and video conferencing and has led to the widespread use of networking technologies such as internet, World Wide Web, intranets and extranets, online data-bases, integration of information system and modeled communication (Olonikawu, 2016 in Akpan, 2008). Accordingly, it is in line with this multi-function nature of ICT that Obanya (2003) describes ICT as the sole creation of humankind that has thrown off balance the conventional perceptions of time and information.

The integration of ICT knowledge in all spheres of human endeavor is no longer news including education. In education, ICT can be viewed as the application of digital equipment to all aspects of teaching and learning. It involves a combination of technologies for collecting, storing, processing, communicating and delivering information related to teaching and learning process (Johnson, 2007). The integration of ICT knowledge has brought to an end the age long barriers to quality education such as time, space, location, convenience etc. Information and communication technology comprises of three key terms; information, communication and technology.

Johnson (2007) defines these lead terms thus:

Information: This is data that have been processed, analyzed, interpreted and meaningful to the receiver of the message; it is very useful in problem solving and decision making.

Communication: This is the process of transferring information from one source to another or from one person to another or group or persons (audience). Information is closely related to communication.

Technology: This is the process of using information to have meaningful control over nature in order to survive the challenges and changes in the environment so that a civilized life of higher standard of living can be achieved.

Many ICT tools that can be used by students to learn via the open and distance education as identified by Yusuf (2006) and Akpan (2008) include among others;

- Computer
- Radio
- Television
- Tele conferencing
- Networking and
- Interactive video

Challenges of Integrating ICT in Open and Distance Education

Despite the numerous prospects of the use of ICT in open and distance education to ensure quality education delivery, several factors have continued to militate against its proper integration. Among such factors include the problem of resistance to change, the attitude of both learners and teachers towards ICT, work ethics, competence and training in ICT and financial constraints (Kidombo, 2009).

Similarly, Yusuf (2006) has identified other factors as problem of electricity, poor economic situations and poor ICT penetration.

Furthermore, Akpan (2008) has reiterated other militating factors to include those of lack of skills in designing course wares, poor internet connectivity and low teledensity.

Integration of ICT in Open and Distance Education

Information and communication technology can be used in any of the following areas in order to ensure quality in education delivery via the open and distance education.

-**Admission of students:** the admission of students could be done on-line to check some foul practices by students.

-**Students' registrations and fees payment:** Online registration and fees payment will help reduce incidences of fraud and reduce the hassles students' god through during such processes, since it will allow students to register at their convenience.

-**New students' Orientation:** Orientation programs are designed to acquaint new students about their courses, criteria etc. Due to the scattered nature of ODE students, the use of e-mails could alleviate the stress of students gathering in one location for orientation courses.

-**Students' Records:** If students' records are digitized, storage and retrieval will be made a lot easier. The stress of checking files will be alleviated making documentation easy for all.

-**Instructional Delivery:** The nature of distance education makes it mandatory for the use of multimedia internet based technologies for effective teaching and learning. Gbadamosi (2006) opines that e-teaching encourages the participation of a large number of students and resolves the problem of inadequate teaching personnel. Proper use of ICT facilities enhances quality instructional delivery.

-**Students' Assessment:** Since instructional delivery can be done on-line, similarly, with effective use of ICT and appropriate media supervision of students' learning activities and assessment of same can be done on-line. In the words of Akpan (2008), the process of e-teaching allows for e-valuation and this helps to curb examination malpractice which has posed a threat to Nigerian education system. This will help ensure quality in students' assessment.

Conclusions

Education worldwide is largely influence by ICT as the world has become a global village. Teaching and learning has become more interactive and interesting with the introduction of ICT into the classroom. This has made ODL to be more accessible to learners irrespective of their location within the country. ICT is being used in many imaginative ways to teach higher order reasoning skills. Evidence abound that computer assisted instruction improves on traditional mode of teaching.

Recommendations

To enhance proper integration of ICT in open and distance education, the following are recommended:

1. Tutors in open and distance learning programs must have a compulsory good training in ICT programs. They must be ICT compliant.

2. High quality and reliable ICT facilities should be provided together with skilled personnel to ensure smooth system runs.

3. The Federal government should ensure adequate funding of distance education programs in Nigeria.
4. The government should improve on the state of power supply in Nigeria.
5. Orientation programmes should be conducted for all teachers and students of distance learning programme on the importance of ICT.

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TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK) AS A FRAMEWORK FOR THE INTEGRATION OF TECHNOLOGY WITHIN TEACHING

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ABSTRACT

*A key factor determining whether new technologies are adopted in teaching is the extent to which teachers know how to use them to support students' learning. The deep knowledge of how technologies can support students' learning of subject area content is known as technological pedagogical content knowledge. In this paper, Technological Pedagogical Content Knowledge (TPACK) as a framework for the integration of technology within teaching is presented. Three main bodies of knowledge – technological knowledge, content knowledge, and pedagogical knowledge – inform the design of this theoretical framework. The framework stems from the notion that technology integration in a specific educational context benefits from a careful alignment of content, pedagogy and the potential of technology, and that teachers who want to integrate technology in their teaching practice therefore need to be competent in all three domains. **Effective teaching requires not only mastery of the subject content, pedagogical techniques, and technological affordances, but also how to achieve a successful dynamic interaction between those three factors.** There is no single technological solution that applies for every teacher, every course, or every view of teaching. Rather, solutions lie in the ability of a teacher to flexibly navigate the spaces defined by these key elements. Accordingly, the characteristics of these three bodies of knowledge, along with the bodies of knowledge that emerge from the interactions between and among them, have been explored.*

Key words; Technology, pedagogy, integration, interactions

Introduction

The advent of digital technology has dramatically changed routines and practices in most arena of human work. Advocates of technology in education often envisage similar dramatic changes in the process of teaching and learning. It has become clear, however, that in education the reality has lagged far behind the vision. However, part of the problem has been that there is a tendency to look at the technology alone as the saviour and not on how the technology is currently used in teaching and learning. Merely introducing technology to the educational process is not enough. The question of what teachers need to know in order to appropriately incorporate technology into their teaching has received a great deal of attention recently (International Society for Technology in Education, 2000; National Council for Accreditation of Teacher Education, 1997; U.S. Congress Office of Technology Assessment, 1995; U.S. Department of Education, 2000; Zhao, 2003).

By extending pedagogical content knowledge to include technology into the Technology Pedagogy and Content Knowledge (TPACK) framework, Mishra and Koehler (2006) enabled new ways of thinking about technology integration and emphasised the intersection of these three domains of knowledge. The literature suggests that there is a steady increase of accumulative knowledge on the development of teachers' TPACK (Harris & Hofer, 2009; Dawson, 2007; Pierson, 2008; Harris, 2008); and this enables new ways of thinking about technology integration. This actually means that TPACK is the basis of good teaching because it promotes the use of "pedagogical techniques that use technologies in constructive ways to teach content" (Mishra & Kohler, 2006, p. 1029).

The well-established framework of pedagogical-content-knowledge was developed by Shulman (1986) who recognised the importance of integrating these two, pedagogy and content knowledge, to help students learn content-specific materials. In recent years when new technologies were introduced into teaching, the technological domain was added to the other two domains (Mishra & Koehler, 2006; Koehler & Mishra, 2009). There is a big shift from viewing the technology as a separate and independent domain into an integrated domain in which good teaching depends on the integration of the three domains (Mishra & Koehler, 2006). Good teaching requires an understanding of how technology relates to the pedagogy and the content (Mishra & Kohler, 2006; Zhao, 2003).

According to Harris, Mishra and Koehler (2009), pedagogical practice and content knowledge are critical in deciding how to introduce and integrate new technologies into teaching, and in particular how to utilise technological knowledge with the other domains. The intersections of the different domains, on the other hand, should not be constrained by the technology. Technological Pedagogical Content Knowledge (TPACK) has been introduced as a conceptual framework for the knowledge base teachers need to effectively teach with technology. The framework stems from the notion that technology integration in a specific educational context benefits from a careful alignment of content, pedagogy and the potential of technology, and that teachers who want to integrate technology in their teaching practice therefore need to be competent in all the three domains.

Technological Pedagogical Content Knowledge (TPACK)

Considerable interest has surfaced recently in using the notion of technological pedagogical content knowledge (Mishra & Koehler, 2006; Koehler & Mishra, 2009) as a framework to understand teachers' knowledge required for effective technology integration. TPACK emphasizes the connections among technologies, curriculum content, and specific pedagogical approaches, demonstrating how teachers' understandings of technology, pedagogy, and content can interact with one another to produce effective discipline-based teaching with educational technologies. In this framework (see Figure 1), there are three interdependent components of teachers' knowledge—content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK)—all framed within and influenced by contextual knowledge.

Equally important to this framework, and particularly relevant to the argument put forth in this article, are the interactions among these bodies of knowledge, represented as pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK). In the following sections, explore will be made of each of these types of knowledge, with particular emphasis on the intersections among technology, pedagogy, and content knowledge as basic insight for effective teaching delivery.
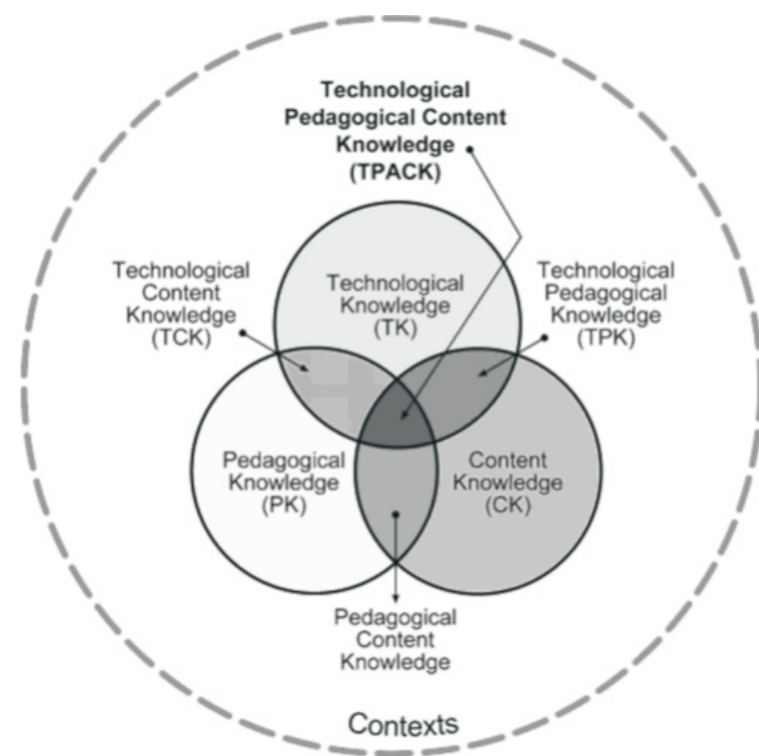
Figure 1: The TPACK Framework and Its Knowledge Components (Adapted from Koehler & Mishra, 2008)

Content Knowledge (CK)

Content knowledge is knowledge about the subject matter that is to be learned or taught, including, for example, middle school science, high school history, undergraduate art history, or graduate-level astrophysics. Knowledge and the nature of inquiry differ greatly among content areas, and it is critically important that teachers understand the disciplinary "habits of mind" appropriate to the subject matter that they teach. As Shulman (1986) noted, content includes knowledge of concepts, theories, ideas, organizational frameworks, methods of evidence and proof, as well as established practices and approaches toward developing such knowledge in a particular discipline. The cost of teachers having an inadequate content-related knowledge base can be quite prohibitive; students can develop and retain epistemologically incorrect conceptions about and within the content area (Bransford, Brown, & Cocking, 1999; Pfundt, & Duit, 2000).

Pedagogical Knowledge (PK)

Pedagogical knowledge is deep knowledge about the processes and practices of teaching and learning, encompassing educational purposes, goals, values, strategies, and more. This is a generic form of knowledge that applies to student learning, classroom management, instructional planning and implementation, and student assessment. It includes knowledge about techniques or methods used in the classroom, the nature of the learners' needs and preferences, and strategies for assessing student understanding. A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills in differentiated ways, as well as how they develop habits of mind and dispositions toward learning. As such, pedagogical knowledge requires an understanding of cognitive, social, and developmental theories of learning and how they apply to students in the classroom.

Technological Knowledge (TK)

Technological knowledge is always in a state of flux—more so than content and pedagogical knowledge. This makes defining and acquiring it notoriously difficult. Keeping up to date with technological developments can easily become overwhelming to time-starved teachers. This also means that any definition of technology knowledge is in danger of becoming outdated by the time this text has been published. There are, however, ways of thinking about and working with technology that can apply to all technological tools, regardless of when they emerged. In that sense, the definition of TK is similar to the notion of Fluency of Information Technology ("FITness") as proposed by the Committee on Information Technology Literacy of the National Research Council (NRC, 1999). The committee argues that FITness goes beyond traditional notions of computer literacy to require that people understand information technology broadly enough to apply it productively at work and in their everyday lives. FITness therefore requires a deeper, more essential understanding and mastery of technology for information processing, communication, and problem solving than does the traditional definition of computer literacy.

Pedagogical Content Knowledge (PCK)

Pedagogical content knowledge is the intersection and interaction of pedagogy and content knowledge. PCK is consistent with and similar to Shulman's (1986) conceptualization of teaching knowledge applicable to a specific content area. It covers essential knowledge of teaching and learning content-based curricula, as well as assessment and reporting of that learning. An awareness of students' prior knowledge, alternative teaching strategies in a particular discipline, common content-related misconceptions, how to forge links and connections among different content-based ideas, and the flexibility that comes from exploring alternative ways of looking at the same idea or problem, and more, are all expressions of pedagogical content knowledge and are essential to effective teaching.

Technological Pedagogical Knowledge (TPK)

Technological pedagogical knowledge is an understanding of how teaching and learning change when particular technologies are used. This includes knowing the pedagogical affordances and constraints of a range of technological tools and resources as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies. Developing TPK requires building an understanding of the potential benefits and limitations of particular technologies as they can be applied within particular types of learning activities, as well as the educational contexts within which these technologically supported activities function best.

An important aspect of TPK is the creative flexibility with available tools necessary in planning to use them for specific pedagogical purposes. The flexible use of tools becomes particularly important because most popular software programs are not designed for educational purposes. Software such as the Microsoft Office Suite (Word, PowerPoint, Excel, Entourage, and MSN Messenger) is designed for use in business environments. Web-based technologies such as blogs and podcasts are designed for purposes of entertainment, communication, and social networking. Teachers, therefore, must have the knowledge and skills that allow them to appropriate technologies for pedagogical purposes, so that they can use Excel, for example, to help children organize and analyze data, and they can create podcasts as ways to share constructed knowledge with others. Thus, TPK must include a forward-looking, creative, and open-minded seeking of technological application, not for its own sake, but for the sake of advancing student learning and understanding.

A large proportion of technology-based learning activities that have been developed in the past to illustrate technology integration, through their lack of emphasis upon content and pedagogy, illustrate an incomplete and comparatively superficial form of TPK. Examples include recommendations for use of generic strategies—such as keypads, telefieldtrips (Rogers, Andres, Jack, & Clausen, 1990), blogging/journaling, preparing PowerPoint presentations, building Web sites, and podcasting—without incorporating acknowledged PCK and PK. Such generic (and techno centric) strategies are described typically in content- and context-neutral terms, assuming that each would work just as well within any content area, at any grade level, and in any classroom.

Technological Content Knowledge (TCK)

Technological content knowledge (TCK) includes an understanding of the manner in which technology and content influence and constrains one another. In planning for instruction, content and technology are often considered separately. It is assumed that developing content is what content experts do (i.e., historians develop history and physicists develop physics), whereas technologist develop technologies (e.g., hypertexts or overhead projectors) and technology integration strategies. When we think of subject matter that students study in school, we often do not think of curriculum content's relationships to the digital and no digital technologies that learners and teachers use. Historically, however, technology and knowledge have been deeply connected. New understandings in medicine, history, archeology, and physics have emerged, in part, from the development of new technologies that afford the representation and manipulation of information and ideas in novel and fruitful ways. Using new technologies (or existing technologies in new ways) can prompt fundamental changes in the nature of the disciplines themselves. Roentgen's discovery of x-rays, for example, changed both diagnostic processes and the nature of knowledge in medicine. The carbon-14 dating technique similarly revolutionized the field of archeology. Consider also how the advent of the digital computer changed the nature of physics and mathematics work, placing a greater emphasis upon the role of simulation in understanding phenomena.

Effective teaching requires developing an understanding of the manner in which subject matter specifically, the types of content-based representations that can be constructed within and across disciplines—can be changed by the use of different technologies. Teachers must understand which technologies are best suited for addressing which types of subject-matter, and how content dictates or shapes specific educational technological uses, and vice versa.

The advent of new technology has often changed fundamentally what we consider to be disciplinary content. Content (be it physics or engineering or sociology) shapes new technologies and offers new uses for existing technologies, while at the same time the affordances and constraints of technologies shape how this content is represented, manipulated, and applied.

Technology is not neutral with regard to its effects upon cognition. Different technologies (or media) engender different mindsets or ways of thinking (Koehler, Yadav, Phillips, & Cavazos-Kottke, 2005; Mishra, Spiro, & Feltovich, 1996). Many of the effects of the invention and diffusion of print can be traced to certain specific properties of print media. Print created texts that were mobile, immutable, presentable, and readable, and these properties led to fundamental changes in human cognition (Latour, 1990). They helped to ensure that discussions could be carried beyond the conversational arena that predominated in the oral cultures of the time. These print objects allowed ideas to be transported and shared without change, so that they could be encountered in consistent ways that mutable, oral retellings would typically disallow.

Developing the Interacting Components of TPACK

How are teachers to acquire an operational understanding of the complex relationships among content, pedagogy, technology, and context? As noted earlier, typical approaches to technology-related professional development are based upon assumptions that it may be enough to just expose teachers to particular educational technologies and possible curriculum-based uses of those tools and resources. Approaches that teach only skills (technology or otherwise) are insufficient. Learning about technology is different than learning what to do with it instructionally. Teaching technology skills (the T in the model above) in isolation does little to help teachers develop knowledge about how to use technology to teach more effectively (TPK), its relationship to disciplinary content (TCK), or how to help students meet particular curriculum content standards while using technologies appropriately (TPACK) in their learning.

Underlying truly effective and highly skilled teaching with technology, is technological pedagogical content knowledge. TPACK is different from knowledge of its individual component concepts and their intersections. It arises instead from multiple interactions among content, pedagogical, technological, and contextual knowledge. TPACK encompasses understanding and communicating representations of concepts using technologies; pedagogical techniques that apply technologies appropriately to teach content in differentiated ways according to students' learning needs; knowledge of what makes concepts difficult or easy to learn and how technology can help redress conceptual challenges; knowledge of students' prior content-related understanding and epistemological assumptions, along with related technological expertise or lack thereof; and knowledge of how technologies can be used to build on existing understanding to help students develop new epistemologies or strengthen old ones. TPACK is a form of professional knowledge that technologically and pedagogically adept, curriculum-oriented teachers use when they teach.

Many aspects of these ideas are not new. As Shulman (1986) and others have argued, teachers' knowledge for effective practice requires the transformation of content into pedagogical forms. What has been overlooked in most cases, are the critical roles that technology can play. For example, Shulman writes that developing PCK requires teachers to find "the most useful forms of representation of [the subject area's] ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations—in a word, the ways of representing and formulating the subject that make it comprehensible to others." (p. 9)

It is interesting to note here that each of the components described by Shulman—representations, analogies, examples, explanations, and demonstrations are constrained, constructed, and defined in critical ways by the affordances and constraints of the digital and no digital technologies used to formulate and represent curriculum-based content. In one sense, there is no such thing as pure content, pure pedagogy, or pure technology. It is important for teachers to understand the complex manner in which all three of these domains—and the contexts in which they are continually formed—co-exist, co-constrain and co-create each other.

Each instructional situation in which teachers find themselves is unique; it is the result of an interweaving of these interdependent factors. Accordingly, there is no single technological solution that will function equally well for every teacher, every course, or every pedagogical approach. Rather, a solution's success lies in a teacher's ability to flexibly navigate the spaces delimited by content, pedagogy, and technology, and the complex interactions among these elements as they play out in specific instructional situations and contexts. Ignoring the complexity inherent in each knowledge component—or the complexities of the relationships among the components—can lead to oversimplified solutions or even failure. Teachers need to develop fluency and cognitive flexibility not just in each of these key domains—content, technology, and pedagogy—but also in the manners in which these domains interrelate, so that they can affect maximally successful, differentiated, contextually sensitive learning.

CONCLUSION

Because teachers' TPACK is not limited to a particular approach to teaching, learning, or even technology integration, it is important that TPACK-based professional development for teachers be flexible and inclusive enough to accommodate the full range of teaching philosophies, styles, and approaches. One way to ensure that flexibility is to share the full range of curriculum-based activity types within each discipline area, encouraging teachers to select among them based on perceived appropriateness and advantage with reference to students' learning needs and preferences, and to engage in this selection/combination process each time they plan a new lesson, project, or unit.

The continual evolution of technology, pedagogy, and content often brings new learning activity types to light. This means that activity-type taxonomies are not static entities, but rather continually evolving as we develop new technologies, new ways of representing content, and new ways of helping different students learn it. Given the ever evolving nature of educational research and practice, and of TPACK's defining elements, it is clear that what we face is at once a tall order and an appealing opportunity: to continue to invent, revise, expand, update, test, and otherwise explore the ways in which we understand and help teachers to develop TPACK. Due to the emergent and interdependent nature of this particular type of professional, applied knowledge, this can be best accomplished as a collaborative endeavor among content experts, educational technology developers, educational researchers, and pedagogical practitioners.

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Undergraduates Readiness to Use Tablet-PCs for Learning in Kwara State

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Abstract
Historically, strong connections exist between education delivery and the technological tools of the era; thus, as technology evolves, so do delivery methods. Tablet computer utilization is driven by undergraduate students' readiness. Hence, the need for this study to determine readiness of undergraduate students' towards utilization of tablet computers for learning in universities in Kwara State. The research was a descriptive research of the survey type. Respondents comprised 274 students drawn from three universities in Kwara state, Nigeria. A structured researcher-designed questionnaire was used for data collection on their readiness towards utilization of tablet computers for learning. The study revealed that undergraduate students were ready to use tablet computers for learning in universities in Kwara State with grand mean score of 3.41. Thus, it was concluded that undergraduates possessed strong level of readiness to use tablet computers for learning. This implies that if tablet computers are integrated into students' learning, there will be improvement in their academic performance as stemmed from Thorndike's law of readiness. It was recommended that undergraduate students should be encouraged to explore the full benefits incorporated in the tablet computers in order to improve on their learning.
Keywords: Readiness, Tablet-PC, M-Learning, Mobile Learning, Law of Readiness, Principles of Learning

Introduction
Tablet-PCs also known as Tablet computers is more like a laptop computer that enables users, through pen technology, to annotate or write on the screen. They have a screen and with their touch screen, any operations can be done on it (Enriquez, 2010). Tablet computers assist users to write or draw on their screen using digital ink. Also, they give opportunities to change and organize slides composed with Power point on it for presentations in classroom (McCabe, 2011). Tablet computers have benefits such as being light, long battery life span, it can also be used for general purposes and not being very expensive. Tablet-PCs are one of the most important technological devices which were invented that experienced series of change and have been used in every field of life. It has been discovered in recent years that tablet computers are being canvassed by scholars in the field of education as being effective in improving teaching and learning process. In the contemporary information age, the issue of students' use of tablet computers and other mobile devices is of crucial importance for their learning (Fabunmi, 2012). Tablet computers are not reserved for personal use alone, but somewhat for communication among individuals, it bridge the gap of communication among student and with their teachers as well, it also offers unlimited means of achieving learning goals. Researchers such as Teo (2008), and Weinberger (2011) stated that the use of computers like tablet computer, smartphones, among other technological devices in learning environments has positive effects on learning and teaching process. They are beneficial for individual learning and learner centered education, it helps to study fast and effectively, help to decrease the human mistakes in work fields and help the students to learn easily, increases students' motivation.

Enriquez (2010) noted that tablet computers provided many benefits for students such as making significant and immediate feedback available to the students about their learning capabilities, also helping them make the most of their learning activities. Fister and McCarty (2008) pointed out that students feel excited, happy and motivated to be in class because of tablet computers and that tablet computers encourage individualized learning among students. The use of tablet computers helps both students and teachers to analyze problems, collect data, take notes, and connect electronic class materials and their hand-written notes. Hussein, Manap, Amir and Krish, (2012), noted that students welcomed the idea of integrating mobile learning devices like tablet computers, smartphones among others into future courses as they were ready to use computing and communication devices for class activities. Pollara (2011), revealed that students would be more engaged in class discussions inside the classroom if they could use tablet computer and would be more engaged both inside and outside the classroom if students could use it to post responses and get immediate feedback from their teachers. Students also indicated that use of tablet computers would allow them to spend more time on classwork and they would be more likely to ask for help if they could communicate with their teachers and share ideas with colleague as well.

The expansion of mobile technology has opened up a myriad of learning opportunities for students in higher learning Institutions who need to cope with a complex and demanding learning environment. For this opportunity to be wholly optimized in learning environment student must be ready to use technology tools for learning activities. Student readiness is the ability of student to use a new technology for learning, it is the preference of the student to use a new technology to achieve educational and non-educational related tasks. The extent to which individuals desire to use new technology is commonly influenced by factors such as the level of technology anxiety demonstrated by individuals and an individual's capacity and willingness to use the new technology (Walker, Lees, Hecker, & Francis, 2002). Research has also shown that individuals who are ready to use technology are more likely to try it and use it in their day to day activities (Parasuraman, 2000).

Also, Parasuraman (2000) proposed a Technology Readiness Index (TRI), which measures readiness to use a technology, it's the its the tendency of undergraduate students to embrace and use new technological tools for accomplishing educational goals and other personal activities. The TRI identifies four dimensions of technology belief that impact an individual's level of techno- readiness. Two of the dimensions are contributors and two are inhibitors of technology acceptance. They are; Optimism: the degree to which individuals believe that technology can benefit their lives and give them more flexibility over their learning life, and Innovativeness; a natural craving of an individual to experiment with new technologies, as well as to be a thought leader. The inhibitors are; Discomfort: a feeling of lacking both control over technology and the confidence in making the technology work, and Insecurity: a need for assurance that a technology-based tools, product, service or process will operate reliably and accurately. The four dimensions are relatively independent of each other; therefore, an individual could harbour both contributor and inhibitor feelings towards technology.

Smith (2004) noted that when a new technology like Tablet- PC is about to be integrated into student learning environment, the external quality of such gadget, its internal characteristics in terms of specifications and features such as the Tablet-PC's functionality, portability, maintainability, reliability and quality could contribute or influence overall readiness. Wagner (2005) stated that the use of technology alone is insufficient to ensure success in learning. Further important factors to be considered include the technological readiness of the students. Also training, seminars, preparation, and learning environments also play a major role in student readiness to use tablet computers for learning. When new technology is born, it is important to find out if students are ready to accept the technology. If mobile learning devices like tablet computers is to be integrated in Universities in Kwara state, then readiness of Undergraduate students should be determined.

Statement of the Problem

The use of tablet computer and smart phones has improved vastly over the years with a staggering figure of over 7.2 billion active mobile devices subscriptions across the globe and 108 million new subscriptions (Ericsson Mobility, 2015), but its major value has not been fully explored by most students in higher institutions of learning as most users of Tablet-PCs use it for social communication, gaming and media viewing purposes. There is a pressing need not to just make tablet computers available in Nigeria higher institutions but also to make them easily affordable, in term of price, good internet connectivity among others. Although universities like University of Ilorin and Federal University of Technology Akure issued tablet computers to their students, there is need to determine the level of readiness of the students to use these devices for learning purpose.

Methodology

This study is a descriptive research of the survey type. A researcher designed questionnaire was used to gather data from 297 respondents selected from three universities in Kwara State, Nigeria. The sample was drawn from the population using multi-stage sampling techniques. This involves using purposively selecting the three most pronounced universities in Kwara state which were, University of Ilorin, Ilorin; Kwara State University, Malete; and Al-Hikmah University. The sample size of 297 from Research Advisor model (2006) was calculated using 95% confidence level and 0.5 level of significance. Then, proportional sampling technique was used to determined the number of respondents expected in each of the institutions based on the total population of students in the schools. Table 1 shows the number of respondents sampled from the institutions visited for this study.

Table 1:
Sampling Frame of Undergraduate Students of Universities in Kwara using Research Advisor

Name of Universities	Estimated Population	Percentage (%)	Sample Size
University of Ilorin	35,354	58	159
Kwara State University	5,947	19	51
Al-Hikmah University	7,408	23	64
Total	48,709	100	274

As indicated in table 1, the total number of respondents that took part in the study was 274. 159 (58.0%) respondents from the university of Ilorin, 51 (18.6%) from Kwara state university and 64 (23.4) from Al-Hikmah university

Data Analysis and Results

Table 2 indicates the demographic distribution of the respondents. The table shows that 130 respondents (57.4%) were males and the remaining 144 respondents (52.6%) were females.

Table 1:
Gender distribution of Respondents

Gender	Frequency	Percentage
Male	130	47.4
Female	144	52.6
Total	274	100

Table 1:
Undergraduate Student Readiness towards Utilization of Tablet Computer for Learning

S/N	Readiness in the use of tablet computers for learning	Mean	Standard Deviation
1	I am prepared to use tablet computer for my learning activities	3.54	.66
2.	I will like to use tablet computer for my educational research	3.52	.67
3.	I want to be able to learn whatever I want anywhere and anytime with the use of tablet computer	3.57	.57
4.	I am prepared to know more about Tablet Computers	3.46	.72
5	I see myself using Tablet computers for educational purposes in future	3.50	.73
6	I am willing to use tablet computers for education activities due to its effectiveness to learning	3.48	.69
7	I am ready to use tablet computer for learning activities provided there is a stable Internet facilities on campus	3.56	.73
8	I would like to learn more about tablet computers, so that I can incorporate it in my education pursuits	3.32	.75
9	I can be taught how to appropriately use tablet computers for learning	3.25	.70
10	I should be able to use tablet computers as learning tools in the classroom	3.39	.72
11	I believe using learning application on tablet computer would benefit me	3.50	.72
12	I would be more motivated to learn if I use tablet computers for educational activities in my classroom	3.24	.87
13	It would be fun to use tablet computers for Learning	3.37	.80
14	I would like to learn how to write using tablet computer writing applications for collaborative learning in class	3.11	.94

Table 3 revealed that students' need to be able to learn whatever they want anywhere and anytime with the use of tablet computer has the highest mean score of 3.57 and its closely followed by students' readiness to use tablet computer for learning activities provided there is a stable Internet facility on campus with a mean score of 3.56. This was followed by I am prepared to use tablet computer for my learning activities which garnered a mean score of 3.54.

I see myself using Tablet computers for educational purposes in future and I believe using learning application on tablet computer would benefit me where both ranked with mean score of 3.50. I am willing to use tablet computers for education activities due to its effectiveness to learning was ranked 3.48. I am prepared to know more about Tablet computers was rated 3.46. I should be able to use tablet computers as learning tools in the classroom with mean score 3.39. It would be fun to use tablet computers for learning with mean score 3.37. I would like to learn more about tablet computers, so that I can incorporate it in my education pursuits was ranked with mean score 3.32. I can be taught how to appropriately use tablet computers for learning 3.25, I would be more motivated to learn if I use tablet computers for educational activities in my classroom and I will like my lecturer to integrate tablet computer in my class in addition to face-to-face mode of teaching because it safe my learning time were both ranked 3.24.

The grand mean score for readiness is 3.41 out of 4. Using a benchmark of 2.5, it can be deduced that undergraduates have high level of readiness towards utilization of tablet computer for learning.

Undergraduate Students Readiness towards Utilization of Tablet Computers for Learning.

The level of readiness among undergraduate students to use tablet computers for learning was examined in research question 1. Based on the mean value of the result on undergraduate students' readiness to use tablet computers for learning, it was determined that great percentage of the undergraduates in Kwara state are highly ready to use tablet computer for learning. The resulting mean score established that undergraduate students' are generally ready to use tablet computer for learning with grand mean above the benchmark of 2.0. The successful integration of any technological tools in learning environments depends on how students are ready to use such devices for learning purposes.

This study postulates that learners are prepared to take greater control of their own learning through the use of tablet computers, hence confirming the finding of Tubaishat and Lansari (2011), which views the promotion of independent learning as one of the important pedagogical attributes of using ICT tools like tablet computers and other mobile devices for educational activities. Findings from the study also revealed that student are ready to learn whatever they want anywhere and anytime with the use of tablet computer, as this will make learning more flexible and easily assessable. From the above findings, it was deduced that the use of tablet computer is important in improving students' performance to learn and so provisions need to be made to ensure that tablet computers are available to learners.

Implication of the Finding

Established on the finding of the study, it could be established that there is an indication that there would be a great improvement in the teaching and learning process at higher learning institutions if undergraduate students' are equipped with technological devices like tablet computer which will enable them succeed in the current technological advance world at large. Therefore, the use of tablet computers for learning could be integrated into universities in Kwara state. The finding of this study may as well establish the "Law of Readiness" which is one of the main principles of learning. The law states that individuals learn best when they are physically, mentally, and emotionally ready to learn, and they do not learn well if they see no reason for learning (Nursing Planet, 2011). This principle further states that motivation is needed for a learner to develop an association or display changed behavior. Getting students ready to learn, creating interest by showing the value of the subject matter, and providing continuous mental or physical challenge, is usually the instructor's responsibility. If students have a strong purpose, a clear objective, and a definite reason for learning something, they make more progress than if they lack motivation. In other words, when students are ready to learn, they meet the instructor at least halfway, simplifying the instructor's job.

Since learning is an active process, students must have adequate rest, health, and physical ability. Likewise, students need to be equipped with the resources needed for learning such as good internet facility and a good tablet-PC for mobile learning. Basic needs of students must be satisfied before they are ready or capable of learning. Students who are exhausted or in ill health cannot learn much. If they are distracted by outside responsibilities, interests, or worries, have overcrowded schedules, or other unresolved issues, students may have little interest in learning.

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THE USE OF WEB 2.0 TECHNOLOGIES FOR DELIVERING LIBRARY USER EDUCATION AND INSTRUCTIONS

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Abstract

This paper examined the use of available Web 2.0 technologies for delivering library user education and instructions in academic libraries. The described the concept of user education and library instruction, identified the traditional methods of delivering user education in the library, identified and explained the Web 2.0 technologies available to facilitate user education delivery, explained the features, application and the benefits Web 2.0 to the delivery of user education and library instruction to the library users. With these discussions, it is evident that Web 2.0 tools support and enhance the innovative and efficient delivery of library user education/instruction. Some of these technologies are assumed to successfully attract new patrons to the library, others may help to retain existing users or make libraries become more important as centres of learning and information resources that is indispensable in academic institutions. The study recommended among others that instructional librarians should be ready to adopt Web 2.0 tools for effective delivery of library education or instruction to the users so as to open a way to interact/share information with users.

Keywords: Web 2.0 technologies, Library education, Library user education, Library instruction, Library programme, Information literacy

introduction

Libraries the world over, in particular, academic libraries support the teaching and research needs of institutions they serve. It is the libraries' responsibility to ensure that the use of its information sources, resources and services are maximized to benefit its users, hence the necessity for user education programmes. User education can be defined as "as various programmes of instruction, education and exploration provided by libraries to users to enable them to make more effective, efficient and independent use of information sources and services to which these libraries provide access" (Gichora & Kwanya, 2015). Some specific components of user education are: Librarians introducing new students, some of whom come from school systems where there are generally no school librarians or well established libraries, to the complexities of university library facilities; Librarians familiarizing users, who have little or no information seeking skills at all with a broad range of library resources in order to develop library skills; and that librarians educating users on how to find materials manually or electronically using on-line public access catalogues and CD-ROMs.

The revolution brought by information and communication technology has resulted to change in the way libraries activities and operations are carried out. The use education is conducted has also been changed. Formerly, before the adoption and integration of ICTs by academic libraries, user education is been conducted manually through face to face interaction in the library halls. In line with the integration of technologies education generally, the delivery of user education in academic libraries now involve the use of one of two technologies especially Web 2.0 technologies.

Web 2.0 is the network or platform, spanning all connected devices. Web 2.0 technologies have "blurred the line between producers and consumers of content and has shifted attention from access to information toward access to other people" (Brown & Adler, 2008, p. 18). Emphasizing a participatory culture, Web 2.0 technologies encourage and enable teachers and learners to share ideas and collaborate in innovative ways. They also force educators to rethink the way we teach and learn and to transform our education practices so that we can support more active and meaningful learning that involves "learning to be" as well as "learning about."

Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an 'architecture of participation' and going beyond the page metaphor of Web 1.0 to deliver rich user experiences" (O'Reilly, 2005) as cited in (Kehinde & Tella, 2012; Tella & Oyegunle, 2016) . Applications of Web 2.0 tools are playing a significant role to enhance the best practices of library activities as well as on-line digital reference services.   Web 2.0 tools are dominating the personal and professional lives of millions of users. The popularity of the tools draws the attention of all the people and it has changed the ways that libraries, museums, archives and other cultural heritage organizations work. As librarianship changes and adapts to the needs of the internet generation, use of these tools has become an essential feature in the work areas of the professionals (Baro, Idiodi, & Godfrey, 2012). Web 2.0 tools and plans have provided innovative practices to the normal way of working in the library profession. Web 2.0 facilities presently offered by libraries include Blogs, Wikis, RSS, Podcasts, Video Casts, Instant Messaging, SNS and Twitter, and others (Baro, Idiodi, & Godfrey, 2012).   The use of Web 2.0 tools and applications brought substantive change in library collection and services. The library collection is changed, becoming more interactive and fully accessible. The library's services are changed, focusing more on facilitating information dissemination and the information retrieval rather than providing controlled access to it (Arora, 2012).

Despite all that have been said above, the fact still remain that many libraries be it academic libraries, special, public, school, and research still do not make use of the opportunities provided by Web 2.0 technology for promote and facilitate the delivery of user education and instruction. In the light of this, there is need to explore what new and wonderful kinds of user education and instructional environments in the library make possible by Web 2.0 technologies (Bower, 2015). The discussion in this paper therefore focuses on what user education or library instruction is all about, the traditional methods of delivering user education in the library, the Web 2.0 technologies available to facilitate user education delivery, their features and application to the delivery user education or library instruction, conclusions and recommendations.

User Education

User education is an attempt to change the behaviour of an individual who will be (or is) developing a search strategy to retrieve useful information. In an ideal world everyone would learn the skills of information retrieval in their formative years at school. In fact, most people can remember being taught how to use the catalogue or the Dewey Decimal System in primary school. However, there's a difference between learning skills specific to the task at hand, and learning skills which will enable you to adapt to a future learning situation (Widodo, 2009). Generally, the skills learned in primary school were specific to that library or even to the subject being researched at the time. There was often no change of behaviour on the part of the student, rather an acceptance that information was (or wasn't) found to suit the assignment. Shinga and Sharma (2015) defined user education "as various programmes of instruction, education and exploration provided by libraries to users to enable them to make more effective, efficient and independent use of information sources and services to which these libraries provide access". User education means, to educate the user or introduce them to how they can make the best use of the library. When a user comes to the library for the first time, he does not know about various activities of the particular library. In user education library staff introduces the user to their services, operations, rule-regulations etc. Lectures, library tour, printed booklet, guides, seminars and workshops, orientation week, display and audio-visual method etc are the techniques of user education.

The objectives of user education can be summarised as follows:
- ➢ Introduce students to facilities and sources in the library to meet their needs and make students independent users and learners in the library.
- ➢ Develop library skills of users. To develop self-sufficient users. To establish the library as the centre of academic activity.
- ➢ Provide basic understanding of the library so that users can make efficient use of library material and services.
- ➢ Introduce library to first year students.
- ➢ Educate users about information sources and resources and how to exploit such resources effectively and efficiently.

Aside of the objectives listed above, it should also be noted that people talk about the belief that to know how to use the library is an essential part of education-for-life; which is to prepare students for the continuing process of self education once the formal process has been completed. In fact the American Library Association issued a policy statement making it clear that *all* types of libraries, not just university and high school libraries, needed to be responsible for user education; in part, it says, "It is essential that libraries of all types accept the responsibility of providing people with opportunities to understand the organization of information. The responsibility of educating users in successful information location demands the same administrative, funding and staffing support as do more traditional programs."

Another importance and objectives of user education was made by Otis Robinson who asserted that "a librarian should be more than a keeper of books; he should be an educator... No such librarian is fit for his place unless he holds himself responsible for the library education of his students. All that is taught in college amounts to very little; but if we can send students out self-reliant in their investigations, we have accomplished very much".   Harold Tuckett defined the self-reliant user as a successful bibliographic problem-solver who learns through information use. This seems to fit Robinson's meaning- they are users who don't bypass the librarian, thinking they know how to use the library without assistance; instead, self-reliant library users know and use the reference librarian as one of the resources that can aid them.

As mentioned in the background, the integration of ICTs into library activities and operations has changed the way and technique in which library user education is being conducted. Apart from the traditional methods and techniques, Web 2.0 technologies are now being used. In order to capitalize on Web 2.0 technologies, librarians and educators need to first understand the sorts of Web 2.0 technologies that are available for library user education and their various features (Redecker, Ala---Mutka, Bacigalupo, Ferrari, & Punie, 2009). Therefore, the next section focuses discussion on Web 2.0 technologies being use by libraries to facilitate teaching and learning.

Web 2.0 Technologies and Library User Education

The term Web2.0 refers to the development of online services that encourage collaboration, communication and information sharing. It represents a shift from the passive experience of static "read only" web pages to the participatory experience of dynamic and interactive web pages. In other words, Web2.0 reflects changes in how we use the web rather than describing any technical or structural change (CILIP,   nd*). The service types of Web 2.0 and their examples are: Social networking (Facebook, Bebo), Video and photo sharing (YouTube, Flickr), Blogging (Blogger, Wordpress), Micro-blogging (Twitter, Tumblr), Social bookmarking (del.icio.us, Digg), Wikis (Peanut Butter, TikiWiki), Resource organising (Pageflakes, Netvibes) (CILIP, nd^). Many Web 2.0 services, such as the examples provided here are often referred to as "social media" due to their role in supporting communication and building online communities.

Web2.0 services are increasingly becoming embedded in many areas of life as more people, from teenagers to national governments, recognize and harness these powerful communication tools (Exeter et al., 2012). Similarly, libraries and librarians all over the world are using Web2.0 technologies to promote library users' education services, share information, and engage with users and network with colleagues, on a global scale. It is believe that social media websites have great potential to enhance the delivery of library services and to contribute to the professional development of library staff. As service users increasingly come to expect interactive online services in all spheres of life, libraries must keep pace with developments elsewhere in order ensuring a responsive service for the future.

Features of Web 2.0
There are features that make Web 2.0 features compatible with the delivery of library user education and instruction. Web 2.0 websites typically include some of the following features/techniques that (McAfee, 2006) used the acronym SLATES to refer to them:
Search: the ease of finding information through keyword search which makes the platform valuable.
Links: guides to important pieces of information. The best pages are the most frequently linked to.
Authoring: the ability to create constantly updating content over a platform that is shifted from being the creation of a few to being the constantly updated, interlinked work. In Wikis, the content is iterative in the sense that the people undo and redo each other's work. In blogs, content is cumulative in that posts and comments of individuals are accumulated over time.
Tags: categorization of content by creating tags that are simple, one-word descriptions to facilitate searching and avoid rigid, pre-made categories.
Extensions: automation of some of the work and pattern matching by using algorithms e.g. amazon.com recommendations.
Signals: the use of RSS (Really Simple Syndication) technology to notify users with any changes of the content by sending e-mails to them."

Mohmed (2009) also identified other characteristics of Web 2.0 technologies that make them compatible with the delivery of library user education as follows:

Participation: Every aspect of Web 2.0 is driven by participation. The transition to Web 2.0 was enabled by the emergence of platforms such as blogging, social networks, and free image and video uploading, that collectively allowed extremely easy content creation and sharing by anyone. Participatory architecture is an architecture where user can add or edit value to the application according to their requirement.
Contrary to the traditional web which was somewhat one-sided, with a flow of content from the provider to viewer, Web2.0 allows the users to actively participate online.
Standards: Standards provide an essential platform for Web 2.0. Common interfaces for accessing content and applications are the glue that allows integration across the many elements of the emergent web.

Decentralization: Web 2.0 is decentralized in its architecture, participation, and usage. Power and flexibility emerges from distributing applications and content over many computers and systems, rather than maintaining them on centralized systems. It is about communication and facilitating community.
Openness: The world of Web 2.0 has only become possible through a spirit of openness whereby developers and companies provide open, transparent access to their applications and content.

Modularity: Web 2.0 is the antithesis of the monolithic. It emerges from many, many components or modules that are designed to link and integrate with others, together building a whole that is greater than the sum of its parts. Users are able to pick and choose from a set of interoperating components in order to build something that meets their needs.

User Control: A primary direction of Web 2.0 is for users to control the content they create, the data captured about their web activities, and their identity. This powerful trend is driven by the clear desires of participants.
Identity: Identity is a critical element of both Web 2.0 and the future direction of the internet. We can increasingly choose to represent our identities however we please, across interactions, virtual worlds, and social networks. We can also own and verify our real identities in transactions if we choose.

Available Web 2.0 Technologies and Their Implementation for the Library User Education
Web 2.0 encompasses several technologies and services which are useful to provide and facilitate the delivery of library user education. Some of them are discuss here along with how they can be applied.

Blogs: A blog is a website where library users can enter their thoughts, ideas, suggestions, and comments (Singha & Sharma, 2015).

Blog can be used to promote library services providing links to recommended sources, listing book reviews, promoting entertainment, providing news for LIS professionals, initiating book discussions, facilitating communication amongst library users and encouraging the development of a community (Mohmed, 2009). Blog entry might contain text, images or links to other blogs and web pages. Any library user can publish a blog post easily and cheaply through a web interface, and any reader can place a comment on a blog post.

Applications of Blog in Library User Education
➢ Blogs serve as a platform where the users can file their concerns, queries and suggestions regarding the services and activities of the library,
➢ Blogs can also be used for the collection development where the users request the resources,
➢ Blogs can be used tools for marketing of the information as well as the library,
➢ Can be used as tool for posting Minutes of the Meetings for necessary actions,
➢ Blogs can serve as discussion forum.

SNSs (social networking sites) encourage a variety of library user education services such as library user education announcements, posting news, updating resources, communicating with users, providing reference service, collaborating on projects, for user services, sending alerts about requested materials, as a way to share information about professional/educational development opportunities, for cataloging, for internal updates, and for networking with other staff, libraries, and library-relevant organizations (Singha and Sharma, 2015).

Application of SNSs in Library User Education
➢ It can serve as platform to share user education resources,
➢ It can serve as announcement tool for user education programme,
➢ It can be used to give back to the users on user education assignments.
➢ Libraries can create a page to reach to new users
➢ Social networking could enable librarians and patrons not only to interact, but to share and change resources dynamically in an electronic medium.
➢ For building network among the interested group of users in discussing the common interest
➢ User content can be added to the library catalogue, including users book reviews or other comments

Really Simple Syndication (RSS): RSS feed through library can offer a variety of services such as workshops/classes, to market ideas, activities, event announcement, new acquisitions, exhibitions, to share library news and content, as well as to gather and distribute related information from other web sources (Mohmed, 2009). LIS professionals can use RSS feeds for Current Awareness Service and SDI (Selective Dissemination of Information) services. This resembles the traditional library services namely CAS and SDI.

Applications of RSS in Library User Education
➢ Announcement of the availability of new books and other resources in a given subject area.
➢ Librarians can subscribe to RSS from the sources for compiling their customized alerts.
➢ Promote events organized in the library for Library Users.
➢ Enhance Library Instruction for different Web 2.0, Library 2.0, Blogs, Wikis, RSS, Tagging, Podcasting, IM programs/courses by integrating appropriate resources.
➢ Announce availability of new research and learning opportunities in various academic/ research departments.
➢ Integrating library services through RSS feeds.

Podcasting: A podcast is a series of audio or video digital-media files which is distributed over the Internet by syndicated download, through Web feeds, to portable media players and personal computers (Mohmed, 2009). Though the same content may also be made available by direct download or streaming, a podcast is distinguished from other digital-media formats by its ability to be syndicated, subscribed to, and downloaded automatically when new content is added.

As Singha and Sharma (2015) postulated, podcasts can be facilitated through a variety of library services like provision of weekly updates new arrival book, lectures, tutorials, events, conferences, in information literacy instruction, library marketing, library instruction, keeping patrons up to date with library information, library guides and tours. Libraries can distribute iPods to their users to intensify their podcasting services and resources.

Applications of Podcast in Library User Education
- Podcasts promotional recordings about the library's services and programs.
- Podcast highlights about new resources
- Podcasts enable librarians to share information with anyone at any time.
- Podcasting can be a publishing tool for users and librarians' oral presentations.

Instant Messaging (IM): IM is a form of real-time communication between two or more people based on typed text, images etc. IM has become increasingly popular due to its quick response time, its ease of use, and possibility of multitasking. It is estimated that there are several millions of IM users, using for various purposes viz: simple requests and responses, scheduling face to face meetings, or just to check the availability of colleagues and friends.

Application of Instant Messaging in Library User Education
- Instant clarifications for the Questions from users and vice versa.
- Online meetings
- For providing virtual reference services.

Tagging: A tag is a keyword that is added to a digital object (e.g. a website, picture or video clip) to describe it, but not as part of a formal classification system. The concept of tagging has been widened far beyond website bookmarking, and services like Flickr (Photos), YouTube (video) and Audio (podcasts) allow a variety of digital artifacts to be socially tagged.

Applications of Tagging in Library User Education
- Tagging can be applied to the LMS for editing the subject headings from the user point of view and thereby enhancing the indexing and relevancy of the searches, making the collection more dynamic.
- Tagging would greatly facilitate the lateral searching.

Benefits of Web 2.0 Technologies in Library User Education

Reaching your audience: The global nature of web based services means that libraries can reach a vast audience, serving more people in the virtual sphere than would be possible at a physical location (CILIP, nd*). For example, by establishing a presence on social media websites, libraries can reach beyond the 'walled garden' to interact with users in online spaces that they are already visiting, rather than passively waiting for users to seek us out. A strong web presence, including representation on social media sites, improves awareness of library services and contributes to a progressive and modern image, which may in turn lead to increased physical visits.

Faster time to Advertise Library User Education- The information environment within which libraries are functioning today is changing faster than ever before. Library 2.0 is a concept of a library service intended towards meeting the needs and expectations of library users faster through its tools such as RSS, Blogs, Social networks etc. Libraries are required to go beyond the needs, wants, and demands of their users and should try to fulfill them by anticipating them as far as possible.

Increased responsiveness- Increased responses are because publishing is easy; so you can focus on content delivery. You can create, update, and publish information on a blog from any computer that's connected to the Internet. Weblog encourages readers to comment. The content can be entered in plain text –and design templates are available. There is no need to have special servers or software installed on your computer.

Closer relationship with customers- Library 2.0 is a user-centered virtual community. Users interact with one another and with the instructional librarians and create more content in less time. User participation in the library user education activities builds a relationship with the users of the library. Relationship is built during the information flow from the user back to the library like comments and questions on library blogs, users uploading their own historical photos to Flickr to create community photo archives and allowing users to review and rate books in the library's catalogue.

Raising awareness and promotion Web2.0 services can be updated quickly and published instantly. This means that time delays associated with traditional web publishing, where IT departments often retain control over website content, can be ignored. For example, by using blogs or microblogs, librarians can go straight to the user with news and up to date information related to new services, materials or service developments.

Professional development
Librarians have been using the internet to communicate, share ideas and offer support for a long time, mainly by using the email network. The advent of Web2.0 technologies presents new opportunities for large scale professional collaboration and cooperation. Many librarians now use Twitter, for example, to get information about activities and initiatives going on elsewhere; and to share ideas or ask colleagues for support. This rapidly expanding network draws on the experience of colleagues at an international level, allowing for the widespread sharing of information and expertise, which then feeds into service developments at a local level.

Conclusion
This paper has examined the use of available Web 2.0 technologies for delivering library user education and instructions in academic libraries. The paper has been able to describe the concept of user education and library instruction, identified the traditional methods of delivering user education in the library, identified and explained the Web 2.0 technologies available to facilitate user education delivery, their features and application together with their benefits to the delivery user education or library instruction. With these discussions, it is evident that Web 2.0 tools support and enhance the innovative and efficient delivery of library user education/instruction to the library users. Some of these technologies are assumed to successfully attract new patrons to the library, others may help to retain existing users or make libraries become more important as centres learning and information resources that is indispensable in academic institutions.

Recommendations
Web 2.0 is not just a technology or a thing but a new paradigm and innovative ways provided by technologies to promote library user education and instruction and makes it more effective. The heart of Library 2.0 is user-centered change. Therefore, there is need for implantation of Web 2.0 technologies in all academic libraries.

Many Web 2.0 tools are freely available in the web and students are already taking advantage of them. They can participate, contribute and collaborate in the creation of a new content over the web. Moreover, there is no financial constraint in using these tools. Thus, University Authority should support the use of these existing technologies rather than developing new technologies from scratch.

The Web 2.0 tools are good in supporting and enhancing the excellent as well as innovative and more efficient library instruction to the users and will also help in reaching out to new potential users. Instructional librarians should therefore be ready to adopt Web 2.0 tools for effective delivery of library education or instruction to the users so as to opens a way to interact/share information with users.

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ASSESSMENT LECTURERS' ATTITUDE TOWARD MOBILE TECHNOLOGY USAGE FOR INSTRUCTION IN COLLEGE OF EDUCATION IN NORTH CENTRAL, NIGERIA

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Abstract

Mobile learning has become a new educational paradigm, gaining popularity especially at institutions of higher learning. Using the latest technology in M-learning, lecturers are able to choose when and where they wish to instruct anything. This study assessed lecturers' attitude toward mobile technology usage for instruction in college of education in North Central, Nigeria. The study is descriptive research of the cross sectional survey. The sample consists of lecturers of the colleges of education in North Central, Nigeria. 468 lecturers were randomly selected and used for the study. A validated questionnaire comprising of 50 items was used to collect data for the study. The result showed that lecturers had positive attitude towards mobile technology usage for instruction, gender had influence on lecturers' attitude towards mobile technology usage in instruction while area of specialization had no influence. The study therefore recommended among others that mobile technology literacy should be spread in colleges of education because of the positive attitudes of the lecturers.

Key words: Attitude, Lecturers, Mobile technologies, Instruction, Colleges of education

Introduction

As mobile technology has matured sufficiently in recent years to support advanced learning activities, its adaptation for this purpose has spread globally. This is natural since lecturers and students are surrounded by mobile technology in their daily lives. Additionally, the proliferation of advanced wireless technologies has facilitated learning on the go, whereby individuals can access educational content regardless of their location. Mobile technology also offers various opportunities for timely and active knowledge acquisition through the exchange of learning materials (Woodill, 2011; Jones, Scanlon, & Clough, 2013).

Due to its wide range of benefits (e.g., cost effectiveness, ubiquity, location-based services, and potential as a study aid), mobile learning is expected to play a significant role in a multitude of educational settings (Cheon, Lee, Crooks, & Song, 2012). Most importantly, mobile technology possesses great potential in offering rich multimedia experiences and resources of a varied nature while enabling students to learn without being restricted by time or location in both formal and informal educational settings (Lam, Yau, & Cheung, 2010; Milrad, Wong, Sharples, Hwang, Looi, Ogata, 2013). Consequently, educational institutions specializing have attempted to develop applications such as mobile learning management systems (LMSs) for students enrolled in e-learning courses. Indeed, the swift deployment of such systems by educational institutions should be a priority given continuously increasing student demand.

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Assessment Lecturers' Attitude Toward Mobile Technology Usage for Instruction in College of Education in North Central, Nigeria

As technology has become more powerful and pervasive it has provided educators with a valuable tool to support learning. Mobile technology, which has advanced considerably over the last decade, has enabled learning to be more accessible. This accessibility has provided educators with a way to support learning inside and outside the classroom. Mobile technology integrates a wide set of tools and applications that enable learning to be dynamic so that students are no longer tied to their desks to experience and interact with learning objects.

Mobile learning is a new concept of learning via mobile technology. In Mobile learning environment, knowledge, skills and attitude can be transmitted through the mobile phones, laptops, tablet PCs and PDAs and so on. Mobile learning places emphasis on the fact that teaching and learning process can take place without being constrained by time and location (Kukulska-Hulme & Traxler, 2005). In other words, teaching and learning can be carried out at anytime and anywhere. There is greater learner mobility. Using mobile technology, lecturers and students can receive and share ideas and materials. They do not need a computer to download any information because the mobile technology devices with internet access can carry out this function anywhere and at anytime. Information also can be relayed by lecturers to their students using either blogs or SMS. Furthermore, there are companies which provide services for sending bulk SMS to registered users. Such services would help lecturers send instructional materials to their students at reasonable rates.

Mobile technology use in learning is considered a new form of distance learning which began to develop since the eighties of the twentieth century from learning by correspondence to the use of the latest media technology in education (Al-Fahad, 2009). E-learning has provided distance learning with new learning methods based computers and computer network technology. Wireless and network technology can provide important learners opportunities for individual whose areas infrastructure needed for e-learning for all who wish to learn. (Hammamy, 2006).

The availability of mobile technology does not actually guarantee that it will be used in an educational setting (Hwang & Chang, 2011). However, the integration of mobile technology into teaching and learning is expected to have great influence on the experience and performance of learners (Mac Callum, & Jeffrey, 2013). It will be the acceptance by lecturers that has the potential to have the greatest influence on the successful introduction of mobile learning (Mac Callum, 2010). Students are able to utilize mobile technology to support informal learning; however without the support and acceptance of lecturers, it is unlikely to be fully integrated into more formal learning. Substantial research has addressed the factors that influence educators' integration of a range of technologies into the classroom, including; environment, policies, support, beliefs and attitude (Albion, 2001; Hammond, Reynolds, & Ingram, 2011; Sang, Valcke, Braak, & Tondeur, 2010). However, factors that impact lecturers' use of mobile technology, however, has only been addressed in a few studies (Aubusson, Schuck & Burden, 2009; Lefoe, Olney, Wright, & Herrington, 2009; Seppala & Alamaki, 2003).

Empirical research on attitude lecturers' towards use of mobile learning has largely been overlooked, as researchers in the past have tended to focus on student adoption (Uzunboylu & Ozdamli, 2011). Lecturers' attitudes have been shown to have a major influence on the acceptance of new technology (Venkatesh, Morris, Davis, & Davis, 2003). The necessity to use mobile technologies in education seems imperative and inevitable. Therefore, preparedness for using this technology in colleges of education should be based on the concept of conviction and acceptance to use it in the teaching learning process. Positive attitudes towards using this mobile technology in colleges of education should be formed and established.

Positive attitudes towards instructional media lead to more achievement than learning directed to gain only knowledge because students are expected to forget knowledge based on remembering. (Husain, 2011).

Forming positive attitudes towards mobile technology increases the desire of the lecturers to learn and improves their abilities to apply and use technology in instruction. (Mohammad & Alkaraki, 2008). Inability of lecturers to use technology in instruction could lead to low student achievement in education. This could be attributed to lecturers' negative attitudes towards the instructional media and the associated hatred and frustration, and these conclusions apply also to lecturers (Keegan, 2010).

Early literature on teachers' attitude towards technology development, adoption, and implementation define attitudes toward technology as an affective (i.e., experience of feeling or emotion) or evaluative judgment about technology in question (Davis, Bagozzi, & Warshaw, 1989). Thus, it is a degree to which an individual perceives technology with the intention to use it (Barki & Hartwick, 1994). Technology, which is believed to be both important and personally relevant, is more likely to create people's positive attitude towards it (Rogers 2003; Teo 2011). For example, Ferdousi (2009) argues that teachers' attitudes have a significant impact on their decisions "…about if, when, and how they will use e-learning systems"

Many studies emphasize that the positive attitudes towards using the new technologies such as the mobile technology in education is associated with better achievement than negative attitudes. However, successful implementation of mobile technology in education relies much on teachers' attitudes towards it (Avidov-Ungar & Eshet-Alkakay 2011; Salmon 2011; Teo 2011; Teo & Ursavas 2012). Liaw, Huang and Chen, (2007) argue that "no matter how advanced or capable the technology is, its effective implementation depends upon users having a positive attitude toward it."

A study by Al-Fahad (2009) indicated students' preference for using the mobile phone in their learning regardless of time and place; that mobile phone enabled them to communicate easily with each other, and to exchange information and data related to their instructional materials. Maecconath and Lynch (2008) study revealed that the students who studied by using the mobile phone achieved higher than the other group. Tennant (2008) and Dong and Agogino (2004) studies indicated that technology enriches learning dramatically through the exchange of information and experiences among themselves. Kook (2007) study indicated that motivation increased towards learning the more they used the mobile phone in education, and they preferred the mobile phone in education. Pachler (2007) thinks that using the mobile technologies in education supports the innovative education and develops the students' activities and strengthens the spirit of research. However, these studies were on students which call for the present study.

Gender and area of specialization are among the factors that the researcher considered being important as are been tested in researches. Even taking into account the two (2) factors are significant; there is still no clear understanding of how and why these factors may affect teachers' attitudes toward mobile technology usage for instruction. Also, literature also associates attitudes by personal characteristics (mediated factors) such as gender, and area of specialization.

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Assessing attitude of lecturers towards mobile technology for instruction is yet another area in which gender may manifest itself. However, generally it often neglected in technology utilization for instruction studies (Gefen & Straub, 1997). Having that, this study further understands the moderating effect of gender on the relationship between the attitude and use. Over decades, although many studies have investigated the role of gender in computer related attitudes and its use, very few studies have incorporated gender as moderator in assessing the attitude and use of mobile technology in an educational context. Chu (2010) revealed that gender differences in the use of the technology should be carefully examined, rather than merely demonstrating differences. Understanding gender differences in the strength of the path coefficients could bring further insight into stereotypical beliefs regarding gender issues especially in developing countries. Furthermore, the magnitude of gender differences may vary across area of specialization (Gefen & Straub, 1997).

Area of specialization is the discipline an individual lecturers in the universities, polytechnics and colleges of education specialized on (Daramola, 2011). In the colleges of education system, this area of specialization can be classified into five, namely Sciences; Art and Social Sciences; Languages; Vocational Education; and Education (NCCE, 2013). Regardless of the school the lecturers belong to, the use of mobile technology for effective teaching cannot be over-emphasized.

It is generally assumed that lecturers with science background may be positively predisposed to computerized system thereby using it more often. Oludipe (2004) reported that subject discipline has no influence on teachers' level of computer literacy. However, Olumorin (2008) revealed that lecturers in Kwara State, irrespective of their area of specialization, have positive attitude and competence in the use of computer.

Teacher education is the key to educational development in Nigeria. The teachers hold the key to national transformation and development. This implies that whatever the quality of education in Nigeria today, is a manifestation of the quality of its teachers. This is so because according to the Federal Republic of Nigeria (2004) no education system can rise above the quality of its teachers. Nigeria has made several attempts to improve the quality of education to meet international standard. This goal cannot be achieved without adequate preparation of lecturers especially in use of technology for instruction to meet the challenges of our contemporary time.

In Nigeria today, individual may not use ICT service for different reason ranging from lack of interest, illiteracy, lack of awareness, exorbitant rate of service, poor quality of service and low per capita income (Kpolovie & Obilor, 2013; 2014; Kpolovie, Obilor & Ololube, 2015). In Nigerian higher institutions (colleges of education in particular), financial dealings are more or less online but the areas of data assessment such as semester's results, GPAs, lectures timetables, and lectures note are still an important issue that has not been attended to with the use of mobile technology even when fees have been charged for the needed ICT facilities. These issues are posing many questions begging for answers. These questions include 'have the lecturers not known the benefits of the use of mobile technology in the various sphere of life? It is against this background that this present study tends to assess lecturers'attitude towards mobile technology for instruction in colleges of education in North central, Nigeria.

Also, the use of mobile technology as an integrated part of educational technology indicates major changes in education which would free the teacher and the student form the constraints of the traditional education and provide the opportunity for human interaction to take place between them. Hence, the need for the adoption of mobile technology in colleges of education for instruction is urgent and necessary.

Statement of the Problem

Mobile technologies have spread among large numbers of people, especially colleges of education students. The teacher education are competing to adopt e-learning and communication media in education since the traditional learning no longer meets the needs of the contemporary society. The colleges of education have to make advantage of the potential applications of the mobile technologies in instruction. Thus, the colleges of education have to provide special environment to make use of the mobile technologies in developing the lecturers' capabilities in instruction and giving them the opportunity and access to the new innovations to reach a high level of excellence and creativity.

Implementing Mobile technology requires a high level of commitment from both lecturers and students; otherwise it would neither be feasible nor effective. Accessing the internet, sending and replying SMS involve certain expenses. Besides that, it is also important to ascertain lecturers' attitude towards the use of mobile technology for instruction before implementing Mobile learning because lecturers are central in the implementation of the teacher education curriculum at the colleges of education. So it is necessary to examine their attitudes towards mobile technology usage in instruction. Hence, there is the need to assess the attitude of colleges of education lecturers' toward mobile technology usage for Instruction in North central, Nigeria.

Objective of the Study

This study assessed lecturers' attitude toward mobile technology usage for Instruction in college of education in North central, Nigeria. Specifically, the study assessed:
1. Attitudes of colleges of education lecturers towards mobile technology usage in instruction.
2. Influence of gender on the attitudes of colleges of education lecturers towards mobile technology usage in instruction
3. Influence of area of specialization on the attitudes of the colleges of education lecturers towards mobile technology usage in instruction

Research Questions

Therefore, the study answered the following questions:
1. What are the attitudes of the colleges of education lecturers towards mobile technology usage for instruction?
2. Does gender influence the attitudes of the colleges of education lecturers towards mobile technology usage for instruction?
3. Does area of specialization influence the attitudes of the colleges of education lecturers towards mobile technology usage for instruction?

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Hypotheses

1. There is no significant difference in attitudes of the colleges of education lecturers towards mobile technology usage for instruction based on gender.
2. There is no significant difference in attitudes of the colleges of education lecturers towards mobile technology usage for instruction based on area of specialization.

Methodology

This study adopted a descriptive survey design of the cross section type. The population for this study was made up of all lecturers in colleges of education in north central, Nigeria. There are 24 state and federal colleges of education in north central, Nigeria. Random sampling techniques was used to select eight colleges of education in view of the directive from National Commission for Colleges of Education the by 2005, all Lecturers of college of education in Nigeria must be computer literate. A sample of 468 respondents was taken from the population using a stratified random sampling technique.

To collect data from lecturers, a questionnaire tagged "lecturers' attitude toward mobile technology usage for Instruction" (LATMTUI) was used. The questionnaire consisted of two sections. Section A elicited respondents' information on gender and area of specialization while section B solicited for information on lecturers' attitude toward mobile technology usage for Instruction in college of education. The instrument consisted of 50 items with response mode of Likert scale with four degrees of strongly agree, agree, disagree, and strongly disagree (4, 3, 2, 1).

The instrument was validated by an educational technology expert in the Federal University of Technology, Minna and a lecturer from Federal College of Education, Kotongora for face and content validity. They were asked to give their opinions of the appropriateness of the items of the instrument to measure what they have been designed for. In the light of their suggestions and criticisms, some items were modified, some items deleted and others added. The final copy of the instrument consisting of 50 items was administered. A pilot study was carried out to verify the reliability of the instrument. The instrument was administered to 25 lecturers of the Kogi state college of education (Technical), Kabba while Cronbach alpha was applied and the reliability coefficient for the internal consistency was calculated and gave a satisfactory level of 0.83

RESULTS

The results are presented in order of the research questions generated for the study.

Research Question 1

What are the attitudes of the colleges of education lecturers towards mobile technologies usage for instruction?

Table 1:
Mean of Lecturer attitude towards mobile technology usage for instruction in Colleges of Education

S/N	Items	Mean
1	I think it is convenient to use mobile technology for educational purposes.	2.86
2	Mobile technology usage for education al purposes requires good planning and preparation.	3.23
3	I want to use mobile technology for instructional purposes.	2.87
4	I encourage my colleagues to use mobile technology for instructional purposes	2.86
5	I hope that lecturers communicate with their students by using mobile technology for the instructional purposes.	2.51
6	Mobile technology usage in instructional requires more time than the other methods.	2.50
7	I practice well using mobile technology.	3.01
8	I would like to receive more knowle dge, experience and training on mobile technology usage for instructional purposes.	3.04
9	I consider the availability of the modern mobile technology for the lecturers to use for instructional purposes is a must.	1.79
10	I think that mobile technology w ill play an important role in e -learning in the future.	3.20
11	Mobile technology usage in colleges of education is not a priority for me	1.70
12	I need more convincing reasons to use mobile technology in instruction	1.48
13	Many materials will be replaced by mobile technology in the future	2.28
14	It is difficult to develop effective teaching methods by using mobile technology.	1.86
15	Mobile technology will increase my instructional qualifications and my scientific achievement.	2.27

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16	I plan to dev elop my skills in mobile technology for using it for instructional purposes.	2.71
17	I think I can catc h up with the development of mobile technologies for using it in colleges of education.	2.60
18	I hate using mobile technology in instruction because I do not know its use.	1.26
19	Mobile technology usage consumes a lot of time.	2.14
20	The practice of using mobile technology is an easy process.	3.10
21	Benefits of mobile technology usage in instruction do not worth its costs.	1.89
22	I think that using the mobile technology in instruc tion will be expensive financially.	1.43
23	I like to take pictures and record portions of lectures or practical things that I study by using the mobile technology.	2.70
24	It is beneficial to use mobile technology on the personal level.	3.19
25	Using mobile technology provides valuable information.	2.85
26	I like to use the mobile technology because it connects me with any person at any time any where.	3.45
27	I think we will be forced to use mobile technology in colleges of education in the future.	2.46
28	I feel that mobile technology usage for instructional purposes will cause social rupture between lecturers and students.	1.38
29	I am worried about thinking of the wide spread of mobile technologies in colleges of education.	1.76
30	I do not think that mobile technology will provide good instructional opportunities.	1.70
31	I tend to generalize the use of mobile technology in instructional because it makes a revolution in the world of education.	2.35
32	I thin k that mobile technology usage in education reduces depending on textbooks.	2.60
33	I prefer using mobile technology in instructional because it is possible to use it anywhere and any time.	2.70

34	I think that using mobile technology enables students to learn many skills and a lot of knowledge within a short time.	2.70
35	I think that mobile technology usage and its technological development have helped to improve our lives.	2.69
36	I feel comfortable when I use mobile technology for instructional purposes because it saves time and effort.	2.63
37	I like to use mobile technology for its advantages such as: indexing names, calendar, calculator….	3.05
38	I enjoy reading topics or access to information related to mobile technology.	2.62
39	I think that learning by mobile technology will be easier to forget than learning by other ways.	1.50
40	I think the educational evaluation process cannot be carried out by using mobile technology.	1.45
41	I like mobile technology usage in education because it can tr ansfer information wirelessly between devices (Bluetooth).	2.56
42	I think mobile technology usage is destructive to the human values.	1.91
43	I feel that mobile technology use for educational purposes deactivated my curiosity.	1.75
44	I feel that mobil e technology usage for educational purposes does not benefit students and does not attract that their attention.	1.66
45	I think that using mobile technology application enables me to develop my skills in English language.	2.73
46	I feel that mobile technology should not be used for all instructional purposes.	2.62
47	I am afraid from mobile technology usage for educational purposes because of the wrong practices by some students.	2.66
48	I do not encourage using mobile technology for instructional purposes because of some of its applications which pollute values and belief.	1.33
49	Lecturers prefer to use mobile technology for instructional purposes because they are advanced technologies.	2.66
50	I think that mobile technology can help me do a lot of diverse and useful things for me in the field of education.	2.73

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Table 1 indicates that with a mean of 2.5 and above benchmark for positive items and below 2.5 for negative items lecturers' attitudes were positive towards mobile technology usage for instruction in colleges of education.

Hypotheses Testing

Ho₁: There is no significant difference in the attitudes of the colleges of education lecturers towards mobile technologies usage for instruction based on gender.

Table 2:
t-test Result for influence o f Gender in lecturers attitude towards mobile technology for instruction

Gender	N	Mean	SD	df	t	Sig (2tailed)
Male	330	17.52	4.01			
Female	320	14.32	3.15	648	2.01	0 .00

Table 2 shows the mean of male and female lecturers' attitude towards mobile technology usage in instruction. Male lecturers (M =17.52, SD 4.01) and the female lecturers (M =14.32, SD 3.15) are significantly different, t (648) = 2.01, p = 0.00. Hence there was a significant difference among male and female lecturers' attitude towards mobile technology usage in instruction. This necessitated the rejection of the hypothesis. The difference is the direction of the male lecturers.

Ho2: There is no significant difference in the attitudes of the colleges of education lecturers towards mobile technologies usage for instruction based on area of specialization.

Table 3:
ANCOVA Result for influence of Area of specialization on lecturers attitude towards mobile technology for instruction

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2751.007	2	1375.503	26.54	1.1
Within Groups	77909.532	647	51.836		
Total	80660.539	649			

From table 3, it was reveal that F (2, 647) =26.54, P>0.05 for the lecturers attitude towards mobile technology usage for instruction. There was no significant difference among lecturers attitude towards mobile technology usage for instruction based on their areas of specialization. This necessitated the accepting the hypothesis.

Summary of findings
1. Lecturers attitudes were positive towards mobile technology usage for instruction
2. Gender had influence on lecturers attitude towards mobile technology usage for instruction in favour of male
3. Area of specialization had no influence on lecturers attitude towards mobile technology usage for instruction

Discussions

Lecturers' attitudes towards mobile technology usage for instruction

Analysis from the attitude of lecturers towards mobile technology usage for instruction are accepted as an indicator of positive attitudes towards mobile technology usage for instruction in colleges of education in North central, Nigeria. This result can be interpreted that the lecturers realize the benefits of mobile technology usage for instruction in colleges of education and the multi uses and applications due to its great capabilities rendered by mobile technology both in conversation, or SMS, and MMS either in the way of access to information or access to data, and the speed to get it in an interesting way to attract the attention of the lecturers. Lecturers may realize these benefits through the use of mobile technology, both on the smart phones, android phones tablets and I-Phone, etc. This result is consistent with the results of the studies of Al-Fahad, 2009, Tenant, 2008, Waycott and Kuklsca-hulme, 2003 and (Kook, 2007).

Influence of gender on lecturers attitude towards mobile technology usage for instruction

The results show that there was a significant difference among the lecturers' attitudes towards the mobile technology usage for instruction attributed to gender. This result may be attributed to the attitudes of male and female lecturers towards the mobile technology. Besides, the general characteristics of males and females are the different cultural, social and economical contexts in which they live, reflecting divergent views of both males and females towards the mobile technology usage for instruction in colleges of education. This result is inconsistent with the results of the studies of Pascler, 2007, Al-Fahad, 2009, Tenant, 2008, Kook, 2007, and Dang and Agogino, 2004. Hence, the issue of gender and mobile technology remains inconclusive.

Influence of Area of specialization on lecturers attitude towards mobile technology usage for instruction

Area of specialization had no influence on lecturers' attitude towards mobile technology usage for instruction. The findings revealed no differences in the lecturers' area of specialization on lecturers' attitude towards mobile technology usage for instruction. This finding is at variance of Oludipe (2004) but at consistence with the studies of Alcuin (2006), Thomas and Mart (2006), Olumorin (2008), Agbatogun (2010) and Daramola (2011). This indicates that lecturers in colleges of education irrespective of their area of specialization want to take the advantage mobile technology had to offer in the teaching learning process.

Implications of the findings

The results of this study revealed that lecturers in colleges of education manifested positive attitude to mobile technology usage for instruction. This indicates that lecturers had some measure of interest in mobile technology. This implies that the non-usage of mobile technology by colleges of education lecturers might be attributed to the non availability of mobile technology facilities in colleges of education. It could be deduced from this finding that if the facilities are available, lecturers might adopt mobile technology for instruction in colleges of education.

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Gender difference in lecturers' attitude towards mobile technology for instruction in colleges of education in north central, Nigeria, calls for concern while planning to adopt mobile technology tools for instruction. This is very important if female lecturers are to benefit maximally from the current drive to integrate mobile technology into teacher education programmes in Nigeria.

Therefore, there were no significant differences in lecturers' attitude towards mobile technology for instruction with respect to area of specialization. This indicated that lecturers, irrespective of their area of specialization, had the same attitude. This implies that lecturers are aware of the importance of mobile technology in the teaching-learning process and in their professional calling.

Limitations of the Study

While this study bears significant implications for providing information on lecturers attitude towards mobile technology for instruction, the generalizability of its results are limited. Consequently, the study's results reflect a unique context that may not be transferrable to other educational systems, and similar studies should be conducted in different educational contexts. Furthermore, not all variables that could significantly affect the attitude of lecturers towards mobile technology for instruction were examined. Finally, data analysis was based on self-reported information, which can be susceptible to response bias. From a methodological perspective, in-depth lecturers' interviews could reinforce the study's results by strengthening their attitude towards mobile technology usage for instruction.

Conclusion

*Mobile technology coupled with Internet accessibility has increased not only how we communicate but also how we might engage in learning. The ubiquity of mobile technology, such as smart phones and tablet devices, makes it a valuable tool for accessing learning resources on the Internet. This study reveal lecturers' positive attitude towards mobile technology for instruction but gender had influence on th*eir attitude while lectures' area of specialization had no influence on their attitude towards mobile technology for instruction.

Recommendations:

Arising from the findings of the study, the researcher recommended the following:

- Mobile technology literacy should be spread in colleges because of the positive attitudes of the lecturers towards the use of the mobile. Also, Colleges of education authorities should provide an enabling environment for lecturers to encourage the use mobile technology for instruction to sustain the positive attitude.

- Programmes should be designed to educate female lecturers in colleges of education about the role of the mobile technology for instruction so as to have its positive and effective reflection on them; and subsequently train them on how to use the technology for instruction.

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TECHNOSTRESS AND ITS RESULTANT INFLUENCE ON JOB PERFORMANCE OF UNIVERSITY LECTURERS IN KWARA STATE, NIGERIA

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Abstract
Working with computer in this modern time is desired for change that is generally accompanied by newly introduced machines at work, home and leisure situations particularly in the university system. Technostress is the general feeling of anxiety and the negative impact on thoughts, behaviours, attitudes and body when a person is expected to deal with technology especially involving the use of computer. This study therefore examined University lecturer's job performance in relationship with the technostress they experience. 270 lecturers from three universities in Kwara State, Nigeria were surveyed using questionnaire. The study revealed that university lecturers in Kwara State are technostressed and they do not rate themselves highly in job performance. The findings also revealed that age is a key factor to the levels of technostress felt by lecturers in the universities. The study concluded that University lecturers in Kwara State are technostressed and this adversely affects their job performance in support of Yerkes-Dodson law. It is recommended that regular trainings and workshops be conducted on job roles that require the use of any Information and Communications Technology tools.

Keywords:Information and Communication Technology (ICT) tools, Technostress, Job-Performance, Yerkes-Dodson law.

Introduction

The utilisation of Information and Communication Technology (ICT) tools in information and knowledge driven society such as the university environment is a fact of life, as no meaningful professional and economic growth and development can be accomplished without their utilisation. Their applications have found usage in every walk of life, most importantly the education sector. Several benefits such as increased productivity, efficiency, accuracy, space economy and reduction in drudgery and routine are derivable from the utilisation of ICT . The educational sector, most especially the universities, have greatly benefited from the adoption and utilisation of ICT. Rawash and Saydam (2012) reported that use of ICT tools have tremendously enhanced the productivity of academic staff of universities as they use ICT for functions such as information collection, processing, reporting, teaching, administrative functions, organization, storage, dissemination and research to mention a few.

ICT tools like computer, internet, intranet and portal system to mention a few are used in the universities aid, assist, manage and provide support to the academic environment. Faculties of Universities in Kwara State have found important uses of ICT in their day-to-day activities and even in carrying out researches (Triantoro , Ahmad , & Muhammad , 2014). Introduction and integration of ICT into University staff job role has changed the work roles and diversified the required skills needed to perform the roles. In order to live up to expectations, universities staff have to make efforts to cope and adapt with new developments (Ranjna, 2015). Some of the staff struggles to accept the computer technology and ICT development, performing their daily roles wishing the new development was not introduced and in the other extreme, some staff becomes over-attached with the new technology that it becomes an obsession.

These attitudes to technology and ICT integration at workplace is what Brod (1984) describe as technostress in his definition that described technostress as a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner.

Technostress manifests itself in two distinct but related ways: in the struggle to accept computer technology characterised with users' feelings of anxiety, fatigue, scepticism and inefficacy beliefs related to the use of technologies, and in the more specialized form of over-identification with computer technology (Technolust), which is exhibited by those who feel comfortable and really gain from the usage of technology. Those who struggle to accept computer technology often feel pressured to accept and use computers.

The University community dependence on Information Communication Technology (ICT) tools and the organizational quest to incorporate such technologies for business and processes has risen dramatically in the recent years. This surge in ICT for organizational processes is demanding employees to constantly adapt to new applications, functionalities and workflows . As the organizational use of ICT becomes increasingly complex, synchronous, ubiquitous, multi-user, challenging and smarter, the organizational employees are finding it difficult to cope with these technologies, leaving them increasingly frustrated and overwhelmed by continued efforts required to master them .

There has been increasing concerns with regard to how to manage changes in the technological outlook of universities with the automation of many of the processes in the system ranging from admission to instruction, result compilation among others. There is concern of how these technological innovations meet staff enthusiasm and effort and how it commensurate with output in terms of staff performance. Previous research to explain the correlation between how ICT affects users and the influence on output has focused on the attitude and perception of the ICT user as determinant factors (Ogunwale, 2015; Charles, 2014; (Ajayi, Awosusi, Arogundade, & Ekundayo, 2011). These studies assumed that the ICT users can decide whether to use ICT or not, which is rarely the case in organisations. The working environment in different Universities in Nigeria continues to evolve largely due to increasing use of ICT tools by the staff of the Universities.

Organisations including Universities in a bid to move along with global ICT revolution oblige their employees to use ICT tools on the job. Staff of universities that adopts ICT tools have been studied to suffer from physical, physiological and psychological health issues such as joint discomforts and illnesses, eye discomfort and optical ailments, radiation, computer anxiety, and panic (Hobbs, 2002; Juul-Kristensen et al., 2006). The importance of lecturers in determining the effectiveness of the teaching–learning cannot be over-emphasized as they are very key to enduring, sustained, effective educational service in the universities. As such, anything that improves or hinders lecturers' satisfaction and performance should be given due attention. This condition shows that there is a need to assess the job performance of faculty in the light of the work environment and technology induced stress they face to achieve better quality and relevant education.

Tarafdar et al (2007) described technostress as a problem of adaptation as a result of a person's inability to cope with or get used to information and communication technologies (ICT). Kupersmith (2003) defines it as computer related stress. Technostress is the general feeling of anxiety and the negative impact on thoughts, behaviours, attitudes and body when a person is expected to deal with technology. The existing literature identi?es several aspects of technostress, including work overload, individual life invasion, high complexity of technology, and occupational crisis (Brod, 1984; Weil & Rosen, 1997; Ahmad & Amin, 2012; McNamara, 2005).

Tarafdar et al. (2007) further developed and validated a technostress measurement scale based on United States data. The scale de?ned ?ve components of technostress that describe typical situations where the use of computer technology can potentially create technostress. The ?ve components are: a) Techno-overload: the ICTs pushes employees to work faster; b) Techno-invasion: the pervasive ICTs invades personal life; c) Techno-complexity: the complexity of new ICTs makes employees feel incompetent; d) Techno-insecurity: the job security of employees threatened by fast changing ICTs; e) Techno-uncertainty: the constant changes, upgrades and bug ?xes in ICT hardware and software impose stress on the end-users.

Tarafdar, Tu, Ragu-Nathan, and Ragu (2007) studied the relationship between the technostress and productivity and revealed that there are different levels of technostress and each of these factors affects employees productivity differently and when combined cause a drop in performance of staff. Other studies have also shown that technostress negatively affects organizational productivity (Spielberger & Reheiser, 2004; Wheeler & Riding, 2004). However, Hung, Chang, and Lin, (2011)reported a positive correlation between pervasive technostress and job performance which supports Yerkes–Dodson law that states that stress is positively correlated with productivity up to a certain point. Excessive stress levels, however, are negatively correlated. In other words, the level of work stress determines how job performance is affected.

Job performance for university lecturers is indicated as outputs of various tasks the lecturers have to accomplish as their duty. These tasks range from teaching, research and publications, marking of tests and examinations, supervising students' research activities, supporting students through advisory roles, attending conferences, providing community services among others. To be efficient and effective in carrying out these functions, the lecturers employ the versatility of ICT tools. This is necessary in order to meet up with the demands of their job. Yusuf (2005) and Daniel (2007), reported that overwhelming majority of lecturers in developed countries use ICT tools to plan lessons and this makes instruction delivery to be more effectively and efficient. With the use of ICT, faculty members have also been able to communicate and collaborate with one another and this enhances their job performance.

This study therefore examined different technostress levels in university lecturers in Kwara state with the influence on the job-performance. The study also examined the influence of age and gender on the technostress experienced by the lecturers in Universities in Kwara state.

Research Questions

1.What are the technostress levels of the lecturers in Universities in Kwara State?

2.What is the influence of technostress on job performance of lecturers in Kwara State?

Research Hypothesis

1.There is no significant difference in levels of technostress faced by younger and older lecturers of universities in Kwara State.

Methodology

This study was a correlation study of descriptive research. The population for this study was lecturers of Universities in Kwara State. The target population was lecturers of University of Ilorin; Kwara State University and Al-Hikmah University. 270 questionnaires distributed among respondents in each of the university selected was proportionate to the total sample size determined using Research Advisor, 2006. The questionnaire measured lecturers' technostress levels bearing in mind the classifications of Tarafdar et al (2007) that divided technostress into techno-overload, techno-complexity, techno-uncertainty, techno-insecurity and techno-invasion. The questionnaire also measured lecturers job-performance with items structured to cut across major key performance indexes of teaching, research and publications, marking of tests and examinations, supervising students' research activities, supporting students through advisory roles, attending conferences and providing community services.

The instrument was validated by educational technology experts at the University of Ilorin and its pilot testing at the Osun State University gave reliability coefficient for technostress among academics as 0.86 and; reliability coefficient for job performance assessment was calculated to be 0.93. The structured questionnaire could be said to be reliable because Gliem and Gliem, 2003 stated that the closer Cronbach's alpha's coefficient is to 1.0 the greater the internal consistency of the items in the scale.

Findings and Discussions

Table 1 shows the overall level of technostress as well as the level for each five dimensions of technostress among University lecturers in Ilorin. The findings show that the overall technostress level is at a moderate level. This suggests that technostress experienced by the university lecturers in Universities in Kwara State was not quite severe in contrast to the study of Ologunde, Akindele, and Akande (2013) that suggested that lecturers in the South-western part of Nigeria experience very high and extreme technostress levels.

Table 1:
Level of Technostress of University Lecturers in Kwara State

Dimensions	Mean	Decision
Techno- Invasion	2.36	Low
Techno-Overload	2.80	High
Techno- Insecurity	2.56	Moderate
Techno- Uncertainty	2.43	Low
Techno – Complexity	3.07	High
Overall Technostress Level	**2.64**	**Moderate**

Among the five technostress dimensions, it was found that university lecturers in Kwara State experience high levels of Techno-complexity and Techno-Overload with mean scores of 3.07 and 2.80 respectively. The automation of processes in universities in Kwara State may have forced the lecturers to feel inadequate or incompetent at handling their job functions hence the new to upgrade their skills. Likewise, the integration of ICT tools into the university system has added to the job roles of the lecturers forcing them to work more within the usual period they had when there was no ICT tool integration. Similarly, the results indicate moderate level of techno-insecurity experienced and this suggest that the existence of technology is not seen as a threat to the respondents' job security. This finding is consistent with Sahin and Coklar's (2009) finding that their respondents had little fear of being unemployed due to the application of new technology. As majority of the respondents were in age range of 50 years and below, they might have started working with the technology already in place and were more technology skilled compared to older employees.

On the extreme side, the university lecturers believed that the effect of techno-invasion and techno-uncertainty on their lives is minimal with mean scores of 2.36 and 2.43. The techno-invasion result supports the study of Ahmad and Amin (2012) that suggested that university automation systems are mostly accessible onsite, unlike other technologies which allows constant connections, the possibility of working outside office hours is limited. The lecturers' response of low techno-uncertainty suggests that there is minimal or no changes, upgrades and bug ?xes in ICT hardware and software integrated into the operations of the university system. Since the innovation is new, universities administration would give the lecturers enough time to get their hands on the technology before any upgrade can be introduced.

Table 2 shows the influence of technostress on the job-performance of university lecturers in Kwara State. The table reveals that there is a significant relationship between technostress and performance with rho value r = .303, p < .05.

Table 2:
Relationship between University Lecturers Job Performance and Technostress

		Performance	Technostress
Performance	Pearson Correlation	1	.303**
	Sig. (2-tailed)		.000
	N	250	250
Technostress	Pearson Correlation	.303**	1
	Sig. (2-tailed)	.000	
	N	250	270

The result in Table 2 shows that when the lecturers in the universities are exposed to a certain level of pressure in form of techno-overload, or techno-complexity, it motivates the lecturers to do more to attain more skills. This would be regarded to as positive performance as it shows a trend towards personal development in the university lecturers lives and also greater efficiency at their different job functions.

Table 3 shows the result of the hypothesis testing for the statement "There is no significant difference in levels of technostress faced by younger and older lecturers of universities in Kwara State". The table shows that the null hypothesis is rejected.

Table 3
t-test Analysis of Technostress faced by Older and Younger Lecturers of Universities in Kwara State

Age	N	Mean	SD	df	T	Sig	Remark
Younger Lecturers (50 & below)	211	2.68	.46				
				268	-8.102	0.00	Rejected
Older Lecturers (over 50 years)	59	3.07	.28				

Table 3 shows that there is significant difference in the way younger lecturers and older lecturers experience technostress. This is reflected in the result: t (268) = -8.102, p < .05. Thus, the hypothesis is rejected. This means that the null hypothesis which states that "there is no significant difference in levels of technostress faced by younger and older lecturers of Universities in Kwara State" is rejected. Older Lecturers in Kwara State experienced higher level of technostress than younger lecturers with evidence shown from the difference in mean scores. This study supports the studies of Sahin and Coclar (2009); Ahmad and Amin (2012) and Agbo (2015) all of which established significant differences in the technostress levels of lecturers below age 50 and those above age 50.

Conclusions and Recommendation

Technostress refers to the state of mental and physiological arousal, and consequent pressure, observed in employees who are dependent on technology in their work. When technostress is moderate, it is a good booster for performance, however, it is detrimental when not checked. The same can be said for Unviersity lecturers in Kwara State, the lecturers are pushed to perform better with moderate and low technostress, but the performance diminishes when the technostress becomes high. The study recommends that regular trainings and re-trainings be carried out on new developments that the universities wish to integrate into the system and also that the lecturers be provided with adequate ICT tools in good condition to carry out their tasks.

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ASSESSMENT OF ICT LITERACY NEEDS AND COMPETENCY LEVEL OF PRE-SERVICE TEACHERS IN UNIVERSITY OF LAGOS

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Abstract

The National Policy on Education (FRN, 2014) has emphasized the use of Information and Communication Technology (ICT) for effective teaching and learning in schools. ICT which are technological tools and resources are employed to communicate, create, disseminate and manage information and also aid communication processes in the classroom. Therefore, in preparing teachers, there is the need for a certain level of literacy and competency in the use of ICT facilities for teaching and learning, which calls for this study on ICT literacy needs and competency level of pre-service teachers. The study is a descriptive study using the cross-sectional survey method. The study sample was drawn from pre-service teachers of faculty of education, university of Lagos. A total of 375 respondents were randomly selected for the study from a total of 1150 students in 300L who had successfully taken a prerequisite course which is ICT related. Two research questions were raised and answered. Mean was used to answer the research questions one to two. The study concluded that Pre-service teachers are literate and competent in the use of ICT tools to to access, manage, integrate, evaluate, and create information needed in their field of study. More so, Pre-service teachers in University of Lagos have the ability of basic computer operations to startup/boot a computer and ability of making use of the internet to search for relevant information. The study recommends that school authorities should lay more emphases on the use of learning platform supports to learning in higher institutions which will also assist the pre-service teachers to be relevant in their chosen profession. Lecturers should also blend the use of ICT along with their methodology of teaching.

Keywords: Pre-service teachers, ICT, Literacy Needs, Competency

Introduction

Technology-enhanced instructional approaches are gradually taking the center stage in the drive to pervade student-centered instructions within the educational setting. Schools in Nigeria are gradually moving away from the conventional methods of teaching and learning to a more controlled environment that is learner centered and make teachers a facilitator with the integration of technology. In the recent years, emerging technologies are transfusing, enriching and facilitating teaching and learning through the use of Information and Communication Technology (ICT).

Information and communication technology (ICT) refer to technological tools and resources which are employed to communicate, create, disseminate and manage information (Nordin, Hamzah, Yunus & Embi, 2010). It is the range of technologies that are applied in the process of collecting, storing, editing, retrieving, and transfer of information in various forms (Olakulehin, 2007). It is a computer based tools used by people to work with information and communication processing needs of an organization (Yusuf & Balogun, 2011). ICT is often perceived as a catalyst for change, change in teaching styles, and change in learning approaches and in access to information (Watson, 2005).

The Federal Ministry of Education, Nigeria (2010) defines ICT as encompassing all equipment and tools (inclusive of traditional technologies of radio, video, and television to the newer technologies of computers, hardware, firm-ware and others as well as the methods, practices, processes, procedures, concepts, and principles that come into play in the conduct of the information and communication activities.

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2013) stated that ICT can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development, efficient management, governance and administration. ICT as a tool of development affects every aspect of human activities because ICT is concerned with the knowledge, skills, tools and systems for locating facts, developing ideas, receiving and giving information as well as for modifying communication strategies. The use of ICT tools depends on the literacy level of individual.

The International ICT Literacy Panel (2001) defines ICT literacy as using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society. This definition is so important in that it lists five critical components of ICT literacy. The five components represent a set of skills and knowledge presented in a sequence that suggests increasing cognitive complexity. The kinds of tasks represented by each component are defined as access (knowing about and knowing how to collect and/or retrieve information), manage (applying an existing organizational or classification scheme), integrate (interpreting and representing information); evaluate (making judgments about the quality, relevance, usefulness, or efficiency of information), create (generating information by adapting, applying, and designing, inventing, or authoring information).

According to the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA, 2005), ICT literacy is *the ability of individuals to use information and communication technology appropriately to access, manage, integrate and evaluate information, develop new understandings, and communicates with others in order to participate effectively in society.*

The purpose of teaching and learning is to deliver a common experience in order to ensure that learners acquire skills, knowledge, and the ability to think critically and to identify interdisciplinary relationships. One of the goals of educational institutions is to make sure that graduates are information literate who can identify, locate and evaluate relevant information to satisfy their information needs (Oliver, 2002). The competency level in the use of Information and Communication Tecnology (ICT) determines how confidently an individual can perform faster in an operation.

Competency is the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform critical work functions or tasks in a defined work setting (Dave, 2010). Competency serve as the basis for skill standards that specify the level of knowledge, skills, and abilities required for success in the workplace as well as a potential measurement criteria for assessing competency attainment (Dave, 2010). Competency is a set of attributes covering knowledge, skills and attitudes for enabling one to effectively perform the activities of a given occupation or function to the standards expected in employment. Competency is the ability to combine and apply relevant attributes to particular tasks in particular situations (Danner & Pessu, 2013). These attributes include high levels of knowledge, values, skill, personal dispositions, sensitivities and capabilities, and the ability to put those combinations into practice in an appropriate way.

ICT competency describes what a teacher should be able to do with technology in professional practice. The major ICT competencies required by teachers include competency in making personal use of ICT; mastery of a range of educational paradigms that make use of ICT; competency in making use of ICT as minds tools; competency in using ICT as tool for teaching, competency in mastering a range of assessment patterns which involves use of ICT; and competency in understanding the policy dimensions of the use of ICT for teaching and learning (Kirschner & Woperies, 2003). Pre-service teacher education should focus on the need for student-teachers to have ICT skills for their own use in the preparation of materials for teaching and learning activities; the need to facilitate the direct use of ICT in students' learning activities within the classroom situation; and the need for teachers to develop in their students a critical awareness of ICT applications and the social implications. ICT is an innovation which is capable of transforming or bringing about drastic changes in our educational system which serves as the basic determinant of the future of pre-service teachers. One of the reforms needed in teacher education in Nigeria is in the area of teacher ICT competencies. It will be very difficult for Nigeria to be among the countries of the world in enjoying the enormous benefits of ICT if the teachers who are supposed to develop and implement strategies for developing ICT competencies of the learners are not able to develop their own ICT competencies. Nigeria needs a new caliber of ICT literate teachers who can move the country to a knowledge society (Lilian & Eyiuche, 2007). This emphasizes the need to improve the ICT contents of teacher education programs in universities in developing nations (Yusuf & Balogun, 2011). However, this study attempt to determine ICT literacy needs and competency level of pre-service teachers in University of Lagos.

Research Questions
1. What are the ICT literacy needs of pre-service teachers in University of Lagos?

2. What is the ICT competency level of pre-service teachers in University of Lagos?

Methodology
The study is a descriptive study using the cross sectional survey method. The study sample was drawn from pre-service teachers of faculty of education, university of Lagos. A total of 375 respondents were randomly selected for the study from a total of 1150 students in 300L during the 2016/2017 academic session who had successfully taken a prerequisite course Introduction to Educational Technology and ICT. Two research questions were raised and answered. Mean was used to answer the research questions one to two. A research designed questionnaire was used to collect for the study. Data collected were analyzed using mean.

Results

Research Question 1: What are the ICT literacy needs of pre-service teachers in University of Lagos?

Table 1:
Pre-Service Teachers ICT Literacy Needs

SN	ITEM	MEAN (X)
1	gathering of appropriate learning resources	3.48
2	gather learning resource that are cost effective	3.06
3	organising resource that are useful for learning	3.39
4	surfing the internet for information that are relevant to my field of study	3.34
5	have detail knowledge of search engines for surfing the internet	3.29
6	can select classified information that allows for learning	3.24
7	manage and construct classified information for learning	3.14
8	integration and recall information to meet my learning need	3.33
9	recognize and treat information for learning appropriately	3.24
10	follow security procedures when surfing through the internet	3.28
11	establish criteria for judging the suitability of information relevant to my learning	3.28
12	identify resources that meet all or nearly all of the criteria	3.14
13	select resources that meet all or nearly all of the criteria	3.15
14	recognize legal and ethical rights of information use	3.24
15	respect legal and ethical rights of information use	3.18

Table 1 reveals that the need for pre-service teachers need to be literate in using ICT tools to gathering of appropriate learning resources with a mean score of 3.48 organising resource that are useful for learning (3.39), surfing the internet for information that are relevant to my field of study (3.34), integration and recall of information to meet anticipated need (3.33), have detail knowledge of search engines for surfing the internet (3.29), recognize and follow security procedures when surfing through the internet (3.28) and establish criteria for judging the suitability of information relevant to my learning (3.28) respectively. The lowest mean score was 3.06 with the statement that pre-service teachers need to be literate in using ICT tools to select information resource that are cost effective for learning. It can therefore, be deduced that pre-service teachers need to be literate in using ICT tools.

Research Question 2: What is the ICT competency level of pre-service teachers in University of Lagos?

Table 2:
Pre -Service Teachers ICT Competency Level

SN	ITEM	MEAN (X)
A	BASIC COMPUTER OPERATIONS	
1	connect the computer system and its peripherals	3.52
2	startup/boot a computer	3.41
3	type fast on the keyboard without errors	3.85
4	locate and run an application package e.g. Microsoft Word, CorelDraw.	3.13
5	install a new application package	3.13
6	copy files from external storage (e.g flash drive) effectively	3.33
7	organize document into folder	3.32
8	open a new document in a Microsoft Word	3.48
9	use simple editing skills e.g justify, centralize, bold, and italic	3.42
10	use Microsoft excel package effectively	2.98
11	enter data and do simple calculation Microsoft excel	2.84
12	create a basic presentation package	2.85
13	import music, picture and also time my presentation	3.19
14	search for relevant information via the search engines	3.49
15	download files from the internet	3.43
16	take pictures of my surrounding and upload it to the internet	3.32
17	send and receive messages through electronic mailing system e.g. Yahoo mail, Google mail, etc.	3.43
	Grand Mean (X)	3.24

From table 2 above, it could be noted that pre-service teachers have the ability of basic computer operations to startup/boot a computer which has the highest mean of 3.60 out of 4. This was followed by the ability of pre-service teachers to search for relevant information via the search engines (3.49), open a new document in a Microsoft Word (3.48), download files from the internet (3.43), send and receive messages through electronic mailing system e.g. Yahoo mail, Google mail, etc. (3.43), use simple editing skills e.g justify, centralize, bold, and italic (3.42) and **connect the computer system and its peripherals** (3.41) respectively. It was revealed that pre-service teachers have challenges in entering data and doing simple calculation in Microsoft excel which has the lowest mean score 2.84.

The grand mean score for ICT competency level of pre-service teachers was found to be 3.24. From the analysis done, the competency level of pre-service is not yet up to the expected standard in using ICT tools.

Discussion and Conclusion

This research studied the ICT literacy needs and competency level of pre-service teachers in the University of Lagos, Lagos state. The result obtained from data gathered and analyzed in this study indicated that pre-service teachers needs to be literate in using ICT tools to access, manage, integrate, evaluate, and create information. The study also discovered that pre-service teachers have the ability of basic computer operations to open a new document in a Microsoft Word, use simple editing skills e.g justify, centralize, bold, and italic, **connect the computer system and its peripherals** and ability of making use of the internet to search for relevant information via the search engines, download files from the internet, send and receive messages through electronic mailing system e.g. Yahoo mail, Google mail, etc. However, pre-service teachers have challenges in entering data and doing simple calculation in Microsoft excel.

Recommendations

Based on the findings of this study, it was recommended that Government should give necessary supports to higher institutions on the procurement of ICT facilities to help pre-service teachers better in the world of ICT. Lecturers should also integrate ICT-based methodology into their lectures to fully harness the use of ICT in the teaching.

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FACTORS AFFECTING UPTAKE OF E-HEALTH SERVICES TOWARD HEALTH CARE DELIVERY IN GOVERNMENT HOSPITALS IN ILORIN METROPOLIS, KWARA STATE

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Abstract

This study investigated factors affecting uptake of e-health services toward health care delivery in government hospitals in Ilorin metropolis, Kwara State. E-health is the use of information and communication technology in support of health and health related fields which include health care services, health surveillance, health education, knowledge and research. The purpose of this study was to: (i) examine whether funding will affect uptake of e-health services towards health care delivery in government hospitals in Ilorin metropolis, Kwara State and (ii) determine if internet bandwidth will affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State. The descriptive research design of survey type was adopted for the study. Multi-stage sampling technique consisting of purposive sampling technique, proportionate sampling technique and simple random sampling technique were used to select three hundred and twenty (320) health workers in government hospitals in Ilorin Metropolis. Researcher-designed structured validated questionnaire was used. A reliability co-efficient of r = 0.72 was obtained through split half technique. Inferential statistics of chi-square (χ^2) was used to analyse the data gathered at 0.05 alpha level of significance. The findings of the study showed that; i. funding was a significant factor affecting the uptake of e-health services because cal. χ^2 value (466.500) > critical value (16.91). ii. Internet bandwidth was a significant factor affecting the uptake of e-health services because cal. χ^2 value (475.844) > critical value (16.91). The study concluded that funding and internet bandwidth were factors affecting the uptake of e-health services towards health care delivery in government hospitals in Ilorin metropolis, Kwara State. Therefore, the study recommended that there should be provision of e-health funds in all state hospitals to cater for e-health services. The hospital administrators should also make internet network available in every nook and crannies of the hospital, and the partner with the best network provider for strong internet bandwidth.

Introduction

Many countries are striving to keep pace with health care delivery because the sustainability and viability of any country's economic and social growth depends to a large extent, on the health care sector. A nation with sick people would certainly not live up to its basic responsibilities. A keen look at Nigeria presents an icky realization that what is required to meet up with this much needed health services are either too few or altogether absent (Eme, Uche& Uche, 2014). Health care is the provision of suitable environment which is aimed at the promotion and development of man's full potentials. It is simply the identification of the health needs and problems of the people, and promoting them with the requisite medical care (Eme, Uche & Uche, 2014).

The e-health initiative is a remote doctor/patient interface which allows patients to consult their doctors without leaving their home or office. With this service, doctors are able to offer 24-hour online patient examination and advice without the patients leaving their homes or offices. However, it does not seek to prevent patients from visiting hospitals but to augment existing health care delivery services (e-healthGhana, 2017).

Electronic health (e-health) refers to the use of Information and Communication Technology (ICT) in support of health and health-related fields, including health care services, health surveillance, health literature, health education, knowledge and research. The definition introduces a range of services such as electronic health records to ensure continuity of patient care across time (Federal Ministry of Health, 2014)

E-health occurs in two forms which include synchronous or 'real time' communications and asynchronous or 'store and forward' communications. Synchronous e-health requires a communication link between two or more parties that allows a real-time interaction to occur. Synchronous e-health may use video-conferencing equipment with attachment of peripheral devices which aid in interactive examinations. For instance, a tele-stethoscope (eStethoscope) allows the consulting physician in remote location to listen to the patient's heartbeat and lungs, a tele-ophthalmoscope (eOphthalmoscope) and tele-otoscope (eOtoscope) allow a remote physician to examine a patient's eyes and ears respectively (Osbert, 2013).

Asynchronous e-health involves the acquisition and transmission of patient's medical data such as radiological studies, laboratory results and biomonitoring information to a physician at a convenient time for assessment offline. A digital image is taken using a digital camera ('stored') and then sent (forwarded) to another location. Asynchronous e-health does not require the parties to be present at the same time (Osbert, 2013).

Components of e-health include telesurgery/telemedicine, electronic consultation (e-consult), Electronic Health Record (EHR), Hospital Information System (HIS), electronic prescription (e-prescription),computerized physician order entry, mobile health (mhealth), wearable and portable systems which communicate health portals, and many other ICT based tools assisting disease prevention, diagnosis, treatment, health monitoring and lifestyle management (Varsha, Gouri, Siamak, Jay, Dan, Graeme & Steven, 2015).

The health care funding system in Nigeria is predominantly by general taxation which is never sufficient for the provision of good health care services . Health care financing has in recent times received extensive research and policy attention in both developed and developing countries. One of the foremost issues is how to raise sufficient resources to finance health care needs for all citizens .

Okeke (2008) opined that underfunding of health care services by the government because of neglect and claims of over-stretched budgets have left many hospitals in Nigeria in a poor physical state, under-staffed, and lacking in modern medical equipment. Consequently, the limited health care professionals inundated by excessive workload seem often stressed to the limits. Aqil Burney, Nadeem and Zain (2010) opined that aside from developed nations like North America and Europe, other developing countries are handicapped. They have significant shortage of resources both financial as well as trained human resource for adapting such systems.

The high cost of implementation of hospital information systems and other barriers are concerns to most authors. A positive correlation has been found between the adoption of health care information technology and positive financial performance both in general organizational and operational processes (Furukawa, Raghu, Spaulding & Vinze, 2008).

The high cost of implementation of all the components of hospital information systems appears to be a global challenge. Apart from a lack of infrastructural requirements for adoption of hospital information system in Nigeria, the neo-cultural influence of materialism and individualism have added to an environment of corruption, thereby creating a vicious cycle (Eckersley, 2005; Okeke, 2008).

The price of computer hardware and software in Nigeria is very high compared with the income of an average Nigerian. This makes it difficult for most people, and even government establishments to buy the equipment .

According to Getzen (2007); Morris, Devlin, and Parkin (2007), adoption of health care technology comes at significant cost implications that consequently impact the cost of health care delivery. Nigeria undoubtedly is more than 95 percent a consumer society with no recognizable production of medical hardware taking place in the country. Cost of importation and delivery further influences the eventual cost of adopting niche health care technology (Okeke, 2008).

The internet is the main link of communication between the rural health care centre and the service provider. It also maintains the network traffic between the physical resources and the cloud. The utilization of modern information technology in the delivery of health care is to enhance the availability and reliability of improved health care services to patients at a reduced cost .

Cloud computing technology has received tremendous attention in recent years. In simplest terms, cloud computing can be defined as a form of computing where shared resources, software, infrastructures and information are delivered to computers and other devices through network or an internet (Fernández, Díez, & Rodrigues, 2012). The accesses to information or network shared resources are not limited by the user's physical location. Therefore, vital resources and people are connected irrespective of where they are around the world, provided there is network connectivity (Fernández, Díez, & Rodrigues, 2012).

The ability of cloud computing to facilitate the exchange of medical information between the health care stakeholders such as the pharmacist, doctors and all other health care institutions that are geographically isolated can help to modernize health care services . Before realizing the importance of internet for accessing health care information, there are some issues that must be addressed by the different nations particularly the developing states like Nigeria. For example, poor Internet skills on the part of health care professionals prevent them from understanding the difference between biased and unbiased information, to differentiate evidence-based claims, and to interpret the information which is meant for health professionals . Developing nations lack appropriate tools and computer systems or utilities to access the relevant and quality health care information.

Inadequate internet bandwidth is also a notable challenge in Africa. Internet connectivity problems abound in Nigeria with the few internet service providers in the market offering very poor services because of bandwidth constraints (Ayo, Ayodele, Tolulope & Ekong, 2008). Effective application of hospital information systems requires broadband Internet connectivity with high-speed capability for data retrieval and transfer (Ouma & Herselman, 2008).

In a study carried out on the the effect of IT policy on Nigerian health sector, their findings revealed that computers and mobile phones were in use in all the teaching hospitals but not much internet connectivity was available, meaning that most of the medical experts used external (nonhospital) internet services, such as cybercafes for even rudimentary internet access (Idowu, Ogunbodede & Idowu, 2003).

Statement of the Problem

The ideal situation when visiting any health care centers is to spend minimal time in the hospital for patients to cater for their health needs. Health care providers should be able to share patients medical record seamlessly with health workers in other location, in case the patients relocates to another location, the current health care provider should be able to have access to patients health history.

The researcher observed that to receive medical treatment in most state hospitals in Kwara state, patients queue up for several hours from one unit of the hospital to another, starting from obtaining a new hospital folder or retrieving an old one before consulting a doctor, to the laboratory unit for test(s) then to the pharmacy to get the prescribed drugs and so on.

The researcher further observed that health sector in Nigeria has not fully utilized the benefits of ICT. The patients' records are normally stored on a paper which can either be misplaced or useless when visiting another health centre. In various health centres across the country, there is no system in place where patients can make appointment in advance with medical and health personnel. It is just the matter of who comes first that is being used except cases of emergency.

Research Questions
1.Will funding affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State?
2.Will internet bandwidth affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State?

Research Hypotheses
1. Funding will not significantly affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.
2. Internet bandwidth will not significantly affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

Funding and Uptake of e-health Services

The health care funding system in Nigeria is predominantly by general taxation which is never sufficient for the provision of good health care services . Health care financing has in recent times received extensive research and policy attention in both developed and developing countries. One of the foremost issues is how to raise sufficient resources to finance health care needs for all citizens .

Okeke (2008) opined that underfunding of health care services by the government because of neglect and claims of over-stretched budgets have left many hospitals in Nigeria in a poor physical state, under-staffed, and lacking in modern medical equipment. Consequently, the limited health care professionals inundated by excessive workload seem often stressed to the limits. Aqil Burney, Nadeem and Zain (2010) opined that aside from developed nations like North America and Europe, other developing countries are handicapped. They have significant shortage of resources both financial as well as trained human resource for adapting such systems.

Information technology and other enabling technologies are extremely expensive than traditional approaches and do not correspond directly to the source of the investment. Government of developing countries cannot afford these technologies without external help. Therefore, medical practitioners, physicians, hospital managers, insurers and other stakeholders need to collaborate to devise collaborative cost-benefit approaches that enable the development and deployment of these technologies (Aqil Burney, Nadeem, & Zain, 2010). Lack of resources is a huge barrier in the implementation of EHR practices . A major reason for incomplete EHR implementation in rural hospitals is a lack of financial and operational resources in addition to lack of knowledge and support for medical staff .

Internet Bandwidth and Uptake of e-health Services

The internet is the main link of communication between the rural health care centre and the service provider. It also maintains the network traffic between the physical resources and the cloud. The utilization of modern information technology in the delivery of health care is to enhance the availability and reliability of improved health care services to patients at a reduced cost .

The ability of cloud computing to facilitate the exchange of medical information between the health care stakeholders such as the pharmacist, doctors and all other health care institutions that are geographically isolated can help to modernize health care services .

Amoo, O. R., Shehu, R. A., Abdulraheem, A. M. & Mohammed, A. I.

Factors Affecting Uptake of E-health Services toward Health Care Delivery in Government Hospitals in Ilorin Metropolis, Kwara State

In Nigeria, small hospitals and private physicians do not have the IT requirements to support the technologies deployed in the system .

Inadequate internet bandwidth is also a notable challenge in Africa. Internet connectivity problems abound in Nigeria with the few internet service providers in the market offering very poor services because of bandwidth constraints (Ayo, Ayodele, Tolulope & Ekong, 2008). Effective application of hospital information systems requires broadband Internet connectivity with high-speed capability for data retrieval and transfer (Ouma & Herselman, 2008).

Research Methodology

Descriptive research design of survey type was adopted for this study. The population for this study comprised all health workers in Ilorin metropolis. Health workers in Kwara State are made of a total of one thousand seven hundred and nine (1709) health workers (Kwara State Hospital Management Bureau, 2017). The target population comprises all skilled health workers in Ilorin metropolis. This makes a total of six hundred and thirty-nine (639) health workers (Kwara State Hospital Management Bureau, 2017).

Multi-stage sampling technique was adopted for the study, which includes purposive sampling technique, proportionate sampling technique and simple random sampling technique, which was used to select three hundred and twenty (320) respondents.

Stage one:

Purposive sampling technique was used to select three local government areas in Ilorin metropolis based on the presence of state hospitals in the local government areas.

Stage two:

Proportionate sampling technique was used to select fifty percent (50%) of the total population which will be three hundred and twenty (320).

Stage three:

Simple random sampling technique was used to select the skilled health workers from each of the hospitals.

A researcher-developed structured questionnaire was used for the study. The instrument contained statements on factors affecting the uptake of e-health services toward health care delivery in government hospitals in ilorin metropolis, kwara state. A four point Likert rating scale with the alternative of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1) was used.

In order to ascertain the validity of the instrument used, three copies of the questionnaire were given to three experts in the Department of Health Promotion and Environmental Health Education, Faculty of Education, University of Ilorin.

Split-half method was used to determine the reliability of the instrument, Cronbach alpha was used to analyse the data and a correlation coefficient (r) of 0.72 was obtained. The administration of the instrument was done by the researcher and four trained research assistants. Inferential statistics of Chi-square was used to analyse the stated null hypotheses at 0.05 alpha level using Statistical Package for Social Science (SPSS) version 20.0.

Data analysis and discussion

Research Question One: Will funding affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State?

Table 1:
Percentile analysis of funding as a factor affecting the uptake of e -health services towards health care delivery in government hospitals in Ilorin, Kwara State.

S/N	ITEMS	SA (%)	A (%)	PR	D (%)	SD (%)	NR
1	Government funding negatively affects uptake of e -health services..	108 (33.8%)	151 (47.2%)	259	37 (11.6%)	24 (7.5)	61
2	Hospital management system prioritization of e-health funds affects uptake of e -health services.	102 (31.9%)	96 (30.0%)	198	52 (16.3%)	70 (21.9%)	122
3	The cost of internet facilities makes uptake of e -health services easier.	112 (35.0%)	94 (29.4%)	206	93 (29.1%)	21 (6.6%)	114
4	The cost of implementation of e-health facilities affects uptake of e-health services.	124 (38.8%)	120 (37.5%)	244	60 (18.8%)	16 (5.0%)	76
	Average score			**227 (71%)**			**93(29%)**

In the table 1, 227(71%) was positive response as regard the research question "Will funding affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State?" while 93(29%) was negative. Since the average score of positive response is greater than the average score of negative response, this implies that funding is a factor that affects the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

Research Question Two: Will internet bandwidth affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State?

Table 2:
Percentile analysis of internet bandwidth as a factor affecting the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

S/N	ITEMS	SA (%)	A (%)	PR	D (%)	SD (%)	NR
1	There is internet bandwidth for the transmission of patients' medical record to a referral hospital.	162 (50.6%)	100 (31.3%)	262	43 (13.4%)	15 (4.7)	58
2	The cost of bandwidth affect uptake of e-health services.	115 (35.9%)	103 (32.2%)	218	84 (26.3%)	18 (5.6%)	102
3	Internet network allows tele - consultation with a doctor from the remote centre (field), thereby encouraging uptake of e-health services.	159 (49.7%)	72 (22.5%)	231	60 (18.8%)	29 (9.1%)	89
4	There is adequate internet bandwidth for uptake of e - health services.	150 (46.9%)	129 (40.3%)	279	25 (7.8%)	16 (5.0%)	41
	Average score			**248(77%)**			**73(23%)**

In the table 2, 248(77%) was positive response as regard the research question "Will internet bandwidth affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State?" while 73(23%) was negative. Since the average score of positive response is greater than the average score of negative response, this implies that internet bandwidth is a factor that affects the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

Hypotheses Testing
Hypothesis one: Funding will not significantly affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

Table 3:
Chi-square analysis investigating funding as a factor affecting the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)	Row Total	Df	Cal. χ^2	χ^2Tab.	Decision
1	Government funding negatively affects uptake of e-health services.	108 (33.8%)	151 (47.2%)	37 (11.6%)	24 (7.5)	320				
2	Hospital management system prioritization of e-health funds affects uptake of e-health services.	102 (31.9%)	96 (30.0%)	52 (16.3%)	70 (21.9%)	320	9	466.500	16.91	H₀ rejected
3	The cost of internet facilities makes uptake tele-health services easier.	112 (35.0%)	94 (29.4%)	93 (29.1%)	21 (6.6%)	320				
4	The cost of implementation of e-health facilities affects uptake of e-health services.	124 (38.8%)	120 (37.5%)	60 (18.8%)	16 (5.0%)	320				
	Column Total	441	461	242	131	1275				

The findings from table three above shows the calculated chi-square (χ^2) value of 466.50 against the table value of 16.91 at 0.05 alpha level with degree of freedom of 12. Since the calculated chi-square value of 466.50 is greater than chi-square table value of 16.91 (Cal, χ^2 val>χ^2 tab. val.). Thus, the null hypothesis was rejected. Which signifies that funding is a significant factor affecting the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

Hypothesis two: Internet bandwidth will not significantly affect uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

Table 4:
Chi-square analysis investigating internet bandwidth as a factor affecting the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)	Row Total	Df	Cal. χ^2	χ^2Tab.	Decision
1	There is internet bandwidth for the transmission of patients' medical record to a referral hospital.	162 (50.6%)	100 (31.3%)	43 (13.4%)	15 (4.7)	320				
2	The cost of bandwidth affect uptake of e-health services.	115 (35.9%)	103 (32.2%)	84 (26.3%)	18 (5.6%)	320	9	475.844	16.91	H₀ rejected
3	Internet network allows tele-consultation with a doctor from the remote centre (field), thereby encouraging uptake of e-health services.	159 (49.7%)	72 (22.5%)	60 (18.8%)	29 (9.1%)	320				
4	There is adequate internet bandwidth for uptake of e-health services.	150 (46.9%)	129 (40.3%)	25 (7.8%)	16 (5.0%)	320				
	Column Total	586	404	212	78	1280				

The findings from table three above shows the calculated chi-square (χ^2) value of 475.844 against the table value of 16.91 at 0.05 alpha level with the degree of freedom of 12. Since the calculated chi-square value of 475.844 is greater than chi-square table value of 16.91 (Cal, χ^2 val>χ^2 tab. val.). Thus, the null hypothesis was rejected. Which signifies that internet bandwidth is a significant factor affecting the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

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Discussion of findings

To the research question one, majority of the respondents were of the opinion that funding affects the uptake of e-health services, the hypothesis one was rejected which implies that funding significantly affects the uptake of e-health services. This finding is similar to the findings of Aqil Burney, Nadeem and Zain (2010) that Information technology and other enabling technologies are extremely expensive than traditional approaches and do not correspond directly to the source of the investment. Government of developing countries cannot afford these technologies without external help. Also Fergus and Igwe (2013) opined that the price of computer hardware and software in Nigeria is very high compared with the income of an average Nigerian. This makes it difficult for most people, and even government establishments to buy the equipment.

To the research question two, majority of the respondents were of the opinion that internet bandwidth affects the uptake of e-health services, the hypothesis two was rejected which implies that internet bandwidth significantly affects the uptake of e-health services. This finding is similar to the findings of Ayo, Ayodele, Tolulope and Ekong (2008), inadequate internet bandwidth is also a notable challenge in Africa. Internet connectivity problems abound in Nigeria with the few internet service providers in the market offering very poor services because of bandwidth constraints. Effective application of hospital information systems requires broadband Internet connectivity with high-speed capability for data retrieval and transfer (Ouma & Herselman, 2008).

Conclusion

Based on the findings of the study, the following conclusions were drawn:

I. Funding is a significant factor affecting the uptake of e-health services towards health care delivery in government hospitals in Ilorin, Kwara State.

ii. Internet bandwidth is a significant factor affecting the uptake of e-health services towards health care delivery government hospitals in Ilorin, Kwara State.

Recommendations

Based on the findings, the following recommendations were made

I. There should be provision of e-health funds in all state hospitals to cater for e-health services.

ii. The hospital administrators should also make internet network available in every nook and crannies of the hospital, and the partner with the best network provider for strong internet bandwidth.

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Expert Rating and Undergraduate Students Attitude towards Developed Interactive Multimedia Instructional Package on Selected Educational Technology Concepts in Kwara State

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Abstract
Instructional technology which is the use of different techniques and methods of passing instruction had undergone different evolutional changes overtime. Among recent development is the imploration of interactive multimedia tools, and techniques to enhance instructional delivery to learners. Disparities in learning abilities among learners necessitated the need to develop a complementary individualized instructional multimedia package that could assist learners to concretize knowledge. This study explored design and development of interactive multimedia instructional package (IMIP) on selected concepts in educational technology for undergraduates in Kwara State, Nigeria. Specifically; it was developed to teach selected educational technology concepts in modules, determined experts' rating of IMIP on the selected concepts and, determined students' attitude towards the effectiveness of the package. The study was a design and development research type. Three research instruments were used to elicit responses from participants. A total of 30, 300-level undergraduates and 10 experts selected through purposive sampling technique participated in the study. Reliability test on the instrument using Croubach's alpha was 0.76. The data collected were analysed using grand mean. The findings revealed among others that: experts rated IMIP high for instructional delivery with grand mean of 3.61 > benchmark mean score of 2.50; while undergraduate students considered it to be highly effective as a learning tool, with grand mean of 3.44. It is therefore recommended that: instructional models should be used to guide the design and development of instructional packages; and students should make use of instructional packages to enhance their learning.

Keywords: Education, Interactive, Multimedia Package, Attitude

Introduction

Education is a life-long activity; it involves impartation, acquisition of knowledge and skills from the teacher to learners, instructor to the tutored, and trainer to trainees. Educational processes has gone beyond the conventional methods, emerging technological tools such as information and communication technology (ICT), social networking sites (SNS) and multimedia are reshaping educational activities.

ICT describes a range of technologies for gathering, storing, retrieving, processing, analysing, and transmitting information. The role of ICT in the 21st century education system has been described as vital to keeping abreast with rapidly changing technologies (Atureta, 2011). This has introduced important changes in the educational system and impact the way we communicate information to learners (Neo & Neo, 2000). Kwasha (2007) opined that, ICT has influenced the quality and quantity of teaching, learning and research in the institutions using it.

Multimedia is a range of technologies that are used for gathering, storing, processing and disseminating information that appeals to various human senses. **Interactive multimedia** normally refer to products and services on digital computer-based systems which respond to the user's actions by presenting content such as text, graphics, animation, video, audio, games, and others.. It is a method of communication in which the output from the media comes from the input of the users. The interactive media lets the user go back with the media, it works with the user's participation. Interactive multimedia in education and training emerged out of the need to share information and knowledge on the research and practices of using multimedia in various educational settings. Students' attitude towards technology based learning is an important factor to be considered in the design and development of such media.

Expert rating is also an important phenomenon in the use of developed instructional resources in the teaching and learning activities. This research therefore, strived to present instructional modules in multi-sensory modes to cater for different learners' preference and motivate them to learn. It explored development of interactive multimedia package to enhance instruction delivery in Nigerian universities and thereby ensure effective increase in learning outcomes as well as providing useful tools for self-study.

Statement of Problem

Multimedia technology adds new dimension to learning experiences because concepts were easier to present and comprehend when the words are complemented with images and animations (Ogunbote & Adesoye, 2006). Despite this advantage, in Nigerian universities, the use of interactive multimedia packages to deliver lectures is not as it is expected to be in this technological dispensation. There is shortage of interactive multimedia instructional facilities for instructional delivery. Furthermore, disparities in learning abilities among learners necessitated the need to develop a complementary individualised instructional multimedia package that could assist undergraduates to concretize knowledge.

These issues prompted the development of interactive multimedia package in selected concepts in educational technology for undergraduates in Nigeria.

Purpose of the Study

The general purpose of the study was to develop a multimedia instructional package for teaching selected educational technology concepts in Universities in Kwara State, Nigeria.

Specifically, the study;

1. designed and developed interactive multimedia instructional package to teach educational technology concepts in modules;
2. determined the experts' rating of the package on the selected educational technology concepts; and
3. determined students' attitude to the effectiveness of the interactive multimedia instructional package.

Research Questions

The following questions were answered in the study;

1. What are the steps involved in design and development of the Interactive Multimedia Instructional Package (IMIP)?

2. What are the experts' ratings of the package on the selected educational technology concepts?

3 What are the students' attitudes towards the effectiveness of IMIP?

Literature Review

Students Attitude towards Interactive Multimedia Instructional Packages

Attitude is the way an individual will feel about an event or object. Attitude is a part of cognitive structure people use to organize, systematize their experiences and behaviors Oladosu, (2011). Guoyuan et al (2009) described attitude as predisposition to respond favorably or unfavorably to an object, person or event. To support this definition, Okoli (2000) expressed attitude as established mental set that a person use to evaluate something favorably or unfavorably. He went further to say that, attitude are inferred from overt behavior both verbal and non-verbal which could be appropriate or inappropriate. In the opinion of Hema (2005), attitude is the mental and neural state of readiness organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects with which it is related. Therefore, this study defined attitude as students attitude towards to effectiveness of the developed interactive multimedia instructional package. Katz (2000) affirmed that, attitudes of students towards the use of ICT are of paramount importance when evaluating effectiveness. Additional research has found Students with positive attitudes toward computer-based instruction scored significantly better on posttests than students with negative attitudes. This will suggest that the importance of attitude in technology-based instruction cannot be underplayed.

Methodology

This study adopted a research design of design and development type. The production work adapted 'Easy test' internet software and relevant YouTube video clips incorporated into power point slides for the development of the Interactive Multimedia Instructional Package (IMIP), and to develop the concepts in modular instructional format. The target population for this research comprised ten lecturers and experts from relevant disciplines and thirty 300-level undergraduates of educational technology offering computer education course. Purposive sampling was used to select the participants in the study. The instrument for the study comprised four items; Educational Technology Experts' rating form (ERF1), Instructional Design Expert's Rating Form (ERF2), and Computer /Telecommunication Expert's Rating Form (ERF3). Each of them contained two sections. Section A contained demographic record of the respondent while section B elicited their rating response regarding the structure, organisation, screen designs, interactivity, instruction ability and adaptability of the interactive multimedia instructional package (IMIP).

The fourth instrument for the study is a researcher designed questionnaire titled; student attitude towards interactive multimedia instructional package. The instrument comprised of two sections, section A dealt with demographic data of the respondent while section B contained ten items which required the respondents to tick appropriate options using the four likert scale ranging from strongly agree (SA) to strongly disagree(SD). The instrument was validated by two educational technology experts, and one lecturer in other related discipline from University of Ilorin for face and content validity. Following the validation reports, some items were modified to enhance the quality of the research.

In order to determine the reliability of the instrument, the package was administered on ten undergraduates from the department of telecommunication, university of Ilorin, which was not part of the sample. Croubach's alpha was used to test the internal consistency of the instrument at 0.05 level of significance and the result was 0.76, hence, the instrument was found to be consistent and reliable. The data gathered were analysed using mean scores at benchmark of 2.50.

Data analysis and Discussion

Table 1:
Educational Technology Expert's Rating

		Mean
A	STRUCTURE	
	The package content is relevant to the selected educational technology concepts	3.50
	Contents are structured in a clear and understandable manner	3.75
B	ORGANISATION	
	The Package is well organised	3.50
	The materials are well presented	3.50
	Navigation through the package is easy	3.50
C	SCREEN DESIGN	
	Screens are designed in a clear and understandable manner	3.25
	The quality of texts, illustrations and graphics is good	3.25
D	INSTRUCTIONABILITY	
	The multimedia instructional package enhances instruction	3.25
	The assessment questions are relevant to the contents	3.50
E	ADAPTABILITY	
	It allows learner to learn at his/her pace	3.50
	The multimedia instructional package motivates learners to learn	3.75
D	INTERACTIVITY	
	The level of interactivity is satisfactory	4.0
	Its immediate feedback enhances learning	3.75
	Grand Mean	**3.54**

The educational technology experts rating of the IMIP in terms of structure, organisation, screen design, instructionability, adaptability and interactivity are; 3.63, 3.50, 3.25, 3.38, 3.63 and 3.88 respectively, each of which was greater than the benchmark of 2.50. The grand mean is 3.54 which is also greater than the benchmark mean of 2.50. The educational experts considered IMIP's contents to be relevant to the contents of selected educational technology concepts, satisfactory in terms of organisation, screen designs, instructionability, adaptability and interactivity.

Table 2:
Instructional Design Expert's Rating

		Mean
A	STRUCTURE	
	The package content is relevant to the selected educational technology concepts	4.0
	Contents are structured in a clear and understandable manner	3.75
B	ORGANISATION	
	The Package is well organised	3.75
	The materials are well presented	3.25
	Navigation through the package is easy	3.50
C	SCREEN DESIGN	
	Screens are designed in a clear and understandable manner	3.50
	The quality of texts, illustrations and graphics is good	3.75
D	ADAPTABILITY	
	It allows learner to learn at his/her pace	3.50
	The multimedia instructional package motivates learners to learn	3.50
E	INTERACTIVITY	
	The level of interactivity is satisfactory	3.0
	Its immediate feedback enhances learning	3.50
F	INSTRUCTIONABILITY	
	The multimedia instructional package enhances instruction	3.75
	The assessment questions are relevant to the contents	3.50
	Grand Mean	**3.56**

The mean scores of instructional design experts rating showed that the relevance of IMIP in terms of structure 1s 3.88. Organisation's mean score is 3.50. Others are; screen design : 3.63, adaptability : 3.50, interactivity : 3.25 and instructionability :3.63, each of which is greater than the benchmark of 2.50. The grand mean is 3.56 which is also greater than the benchmark mean of 2.50. From table two, instructional design experts considered IMIP to be satisfactory in terms of structure, organisation, screen designs, adaptability, interactivity and very suitable for instruction,

Table 3:
Computer/Telecommunication Expert's Rating

		Mean
A	STRUCTURE	
	The package content is relevant to the selected educational technology concepts	3.50
	Contents are structured in a clear and understandable manner	4.00
B	ORGANISATION	
	The Package is well organised	4.00
	The materials are well presented	3.50
	Navigation through the package is easy	3.50
C	SCREEN DESIGN	
	Screens are designed in a clear and understandable manner	3.50
	The quality of texts, illustrations and graphics is good	4.00
D	INTERACTIVITY	
	The level of interactivity is satisfactory	4.00
	Its immediate feedback enhances learning	3.50
E	INSTRUCTIONABILITY	
	The multimedia instructional package enhances instruction	4.00
	The assessment questions are relevant to the contents	3.50
F	ADAPTABILITY	
	It allows learner to learn at his/her pace	4.00
	The multimedia instructional package motivates learners to learn	3.50
	Grand Mean	**3.73**

One computer and one telecommunication experts did rated IMIP and the mean scores of their ratings is as follows: Structure : 3. 75, Organisation : 3.67, Screen Design : 3.75, Interactivity : 3.75, Instructionability :3.75 and Adaptability :3.75. Each of their rating mean score, as well as the grand mean of 3.75 is greater than the benchmark mean of 2.50. From the above, the computer and telecommunication experts considered IMIP to be satisfactory in terms of structure, organisation, screen designs, interactivity, Instructionability and adaptability.

Research Question Three: *What are the students' attitude towards the effectiveness of the Interactive Multimedia Instructional Package (IMIP)?*

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Table 4:
Analysis of students' attitude towards the effectiveness of IMIP

	Mean
1. IMIP modular topic contents are relevant to the objectives stated	3.40
2. The modular lectures in the package are easy to understand	3.30
3. Navigating through the package is easy	3.30
4. The modular lectures are relevant to the selected Educational Technology concepts	3.70
5. The assessment questions are appropriate and enhance memory of the acquired knowledge	3.25
6. Getting immediate result and feedback reinforces learning	3.75
7. The multimedia approach of IMIP motivates me to learn	3.45
8. I enjoy using IMIP and prefer taking other courses with it	3.25
9. The Package is adequate for self-paced learning; it enables me to accomplish tasks more quickly	3.60
10. I prefer taking instruction with interactive multimedia instructional package to normal class lecture.	3.45
Grand Mean	**3.45**

The responses of thirty 300-level educational technology students offering computer education course on attitude towards the effectiveness of the package based on 10 criteria were analysed with each of their attitude towards mean score greater than the benchmark mean of 2.50. 'Getting immediate result and feedback reinforces learning' had the highest mean score of 3.75 while criteria 5 and 8 had the least mean score of 3.25 each. The grand mean of 3.45 is greater than the benchmark mean of 2.50.

Generally they considered the package to be very effective for instructional delivery purpose.

Summary of Major Findings

Based on the analyses and interpretation of the data collected from the respondents in this study, the following summaries were obtained:

1. ADDIE model could guide the design and development of interactive multimedia instructional package for instructional delivery

2. The experts rated the interactive multimedia instructional package(IMIP) high for instructional delivery of selected educational technology concepts in terms of structure, organisation, screen design, instructionability, adaptability and interactivity. Grand mean of 3.53 > benchmark mean score of 2.50; and

3. Undergraduate students considered IMIP to be highly effective as a learning tool, with grand mean of 3.73 > benchmark mean score of 2.50

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LECTURERS' AWARENESS, READINESS AND PERCEIVED USEFULNESS OF ELECTRONIC RESPONSE SYSTEM FOR TEACHING LARGE CLASSES IN TERTIARY INSTITUTIONS IN NIGER STATE, NIGERIA

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Abstract

This study investigated lecturers' awareness, readiness, perceived usefulness and challenges of using Electronic Response System (ERS) for teaching at tertiary institutions in Niger state. The study sample spans across the tertiary institutions in the state which include the three federal government institutions and three state government institutions. The sample consists of a total of 314 respondents with male respondents accounting for approximately seventy percent of the total respondent while approximately thirty percent of the respondents where female. Electronic Response System as an ICT tool for teaching served as the stimulant for the assessment of lecturers' awareness, readiness, and perceived usefulness and challenges. Gathering of data was achieved by the use of Questionnaire structured to cover the range 5 sections (A-E), with section A accounting for respondents Bio-data, Section B, C and D records respondents opinion on their awareness, readiness, Perceived Usefulness of using Electronic Response System respectively. Three research questions with corresponding three hypotheses were formulated for the study. The hypotheses were tested using Mann Whitney non-parametric statistics. The result of the study shows that there was no significant relationship between Gender and lecturers' awareness, readiness and perceived use of Using Electronic Response System for teaching large class in tertiary institution in Niger state. It was recommended that Electronic Response System should be integrated into teaching at tertiary institutions in Nigeria.

Keywords: Lecturers, Awareness, readiness, Perceived Usefulness, Electronic Response
System, Tertiary Institutions

Introduction

The 21st century technological tools application has open new innovative strategies for the mobile, online options to digitize teaching and learning opportunities available for lecturers and student alike. Hence, the need for effective techniques of handling modern communication facilities is very important because communication remains a major sustenance of the world existence and to transfer values and skills from one generation to another. Invariably, without good communication the world would have been a difficult place to live (Raji & Abdulkarim, 2009). Information Communication Technology (ICT) is a tool for enhancement of teaching and learning and for fostering development and acquisition of skills by teachers and student for economic and self reliance (Wushishi & Aniah, 2013). Recently, ICT tools such as Podcasts, Mobile Phones, iPad, Interactive Whiteboard, Electronics Response System among others are mostly used for teaching and learning.

Electronics Response System (ERS) is a system where multiple choice questions are developed and students are at liberty to choose different options and the result is presented in a graphical form, The questions could be developed in an open ended format, where student can give text answer in a long or short answer format. This technological tool that has receiving and sending terminal. The transmitter is mainly used by the students to give back responses to the stimulus (question) while the receiving terminal is the input interpreter which is a computer and the software that shows in real time the aggregates of the response. The responses are visual to both the lecturer and the learner to show both lecturer and learner response rate and distribution within the class setting. The lecturer decides on the level of anonymity of respondents by choice either to make respondent totally, partially or visible to all. Also known as CATAALYST (classroom aggregation technology for activating and assessing learning and your students thinking) system (Adam, 2016).

Electronic Response System has great potentials to overcome problems of teaching large class. It can enhance effective teaching and learning process, make learning interactive, improve critical thinking, encourage active participation, increase student attendance, arouse interest and desire to learn, promote retention and memory, and helps to save teaching time (Beatty & Gerace, 2009). Feedback from different stimuli can also promote teaching whereby the lecturer is able to adjust his lesson to the demand of all students. In addition, it gives students the opportunity to submit ideas and questions which the answer can be decided by voting. It can be used to pose question to audience to either agree or disagree. Electronic Responds System can also be used for computer- based test and to monitor student attendance. The use of electronics response system cut across all discipline (Stowell & Nelson, 2007).

Class room response system remains the most efficient in getting honest response from students which help the lecturer to make a valid generalization of the student level of cognitive. In spite the importance of Electronic Response System in teaching and learning in tertiary institutions, lecturers' in developing nations are not aware the classroom application and benefits of this technological tool. Few that aware of the usefulness of Electronic Response System are incapacitated to use it due to non-availability, non-accessibility, cost of purchase, lack of skills to use it, or not ready to adopt it into teaching and learning. However, in most of developed nations, for instance, Shenzhen city in China, the English teachers aware of the importance and use of ICT for teaching and learning even in primary school (Li, Hoque, AbdulRazak, 2014).

Teachers' readiness to integrate technological tools to classroom could enhance effective teaching and learning process in educational system (Azimi, 2013). Kauffman and Kumar (2005) emphasized that readiness is one of the stages of diffusion of ICT. They argue about the freshness of technological tool in a locality or nation, that the readiness of its general public to implement it is a critical issue. As noted by Mndzebele (2013) that ICT readiness adoption permits one to plan comprehensive e-Learning tactics and efficiently implement ICT goals. Krull (2003) opined that readiness to use ICT helps an administrator or planners to measure and plan for ICT utilization, focus their determinations and detect areas where additional attention is mandatory. It also gives more insight on the usefulness of such ICT tools.
Perceived usefulness of ICT tools such as electronic response system put emphasis on the incorporation of such technology in education. Utilization of this technological innovation in learning situation will make learning more interesting for learners and teaching easier for the teachers and create a viable teaching-learning environment (Azimi, 2013). With frequent use, continuous acquisition of knowledge and skills of ICT, gender inequity that exists in computer use, access, career and attitude could be eliminated.

Gender issue is very vital in the educational process. It is an issue which cannot be down-played in educational research. Some studies have revealed that females have negative attitudes towards computer than the males (King & Joshi, 2008;; Chukwuemeka, 2010). Some revealed that females perform better than males (Lau & Sim. 2008; Hennessy, Harrison, Wamakote, 2010). Some studies indicated that there was no gender influence on lecturers' attitude towards the use of ICT (Krishnakumar, Rajesh, 2011; Umar, Gambari, Nsofor, & Ahmadu, 2017).

In a study conducted by Salehi and Salehi (2012), it was reported that most respondents agree that lecturers' aware of the use of ERS for teaching. Similarly, Smith and Doyle (2002) rported that new ICT tools make available a channel through which lecturers' can supplement their teaching. However, Dhanavandan, Mohammed and Mani (2006) reported that the utilization of communication tools by the female respondents is relatively higher than the male respondents. Likewise, Lina Markauskaite (2006) reported significant difference between male and female ICT literacy and online learning.

Contrary to the findings of Lina Markauskaite (2006), Elsaadani (2012) recently reported that no significant difference was found between male and female participants' attitude toward ICT. In support of this, Anunobi, Gambari, Abdullahi and Alabi (2017) reported that male and female student lecturers have no substantial difference in the level of ICT usage. Also, Dhanavandan, Mohammed and Mani (2006) reported that no significant connection between the variables regarding the usage of e-mail and Internet on gender. However, Ejechi, (2013) reported that ICT use was significantly better with men than women.

Based on this above literature, studies on gender influence on lecturers' awareness, readiness and perceived usefulness of ICT in general and electronic response system in particular is inconclusive. The lecturers' awareness, readiness and perceived usefulness of electronic response system in teaching should be investigated if technology tools for teaching and learning should be relevant within the educational context. Therefore this study investigates lectures' awareness, readiness, and perceived usefulness of using electronic response system for large class in Niger state tertiary institutions.

Statement of Problem

Conventional method of teaching where learners listen while the lecturer make all the talking is mostly common in Nigerian tertiary institutions today and rate of disengagement of learners in large class is of great concern. This method is mono-directional and teacher-centred approach. It makes students feel bored due to lack of interaction between student-student, student-teacher and teacher-student. Teacher waste a lot of time and energy during instruction making teaching and learning process frustrating. In Nigeria, the problem of large number of student in a class poses a big challenge for effective teaching and learning in the 21st century. Class control is difficult in a rowdy and unconducive environment in most of the large class. The use of ICT tool such as electronic response system could provide a means of overcoming some of these problems in tertiary institutions. Therefore, this research sought to find out the awareness, and readiness perceived usefulness of using Electronic Response System for teaching teaching and learning in tertiary institutions in Niger state, Nigeria.

Research Questions

(i)What is the difference between male and female lecturers' awareness on the use of ERS?
(ii)Do lecturers' gender has influence on their readiness to use ERS?
(iii)What is the difference between male and female lecturers' perceived usefulness of ERS?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:
Ho$_1$: There is no significant difference between male and female lecturers' opinions on the awareness of the use of ERS for teaching in tertiary institutions.
Ho$_2$: There is no significant difference between male and female lecturers' readiness in using ERS for teaching in tertiary institutions.
Ho$_3$: There is no significant difference between male and female lecturers' in perceived usefulness of ERS for teaching in tertiary institutions.

Methodology

Research Type

This study adopted descriptive survey. Survey as a method usually adopted when handling a large population especially on issues that comprise of systematic collection of data from samples drawn from the populace to represent the entire population (Bello & Ajayi, 2004). In this study, survey was embraced because it helped to obtain adequate sample from the participants in tertiary institutions in Niger state.

Sample and Sampling Techniques

The population of this study spanning across all tertiary institutions in Niger state which includes: Federal University of Technology, Minna; Ibrahim Babangida University, Lapai; Federal Polytechnic, Bida; Niger State Polytechnic, Zungeru; Federal College of Education, Kotangora; Niger State College of Education, Minna. Table 1 shows the population of the study.

Table 1:
Population of the Study

Name of Institution	Location	Population
Federal University of Technology	Minna	892
Ibrahim Babangida University	Lapai	320
Federal Polytechnic	Bida	620
Niger State Polytechnic	Zungeru	210
Federal College of Education	Kotangora	283
Niger State College of Education	Minna	230
Total		**2,492**

Source: Bursary Units of Various Institutions in Niger State

A multi-stage sampling technique was used to select sample from target populations for the study. According to Krisna (2009) multistage random sampling is sampling technique need minimum of two step withdrawal of sample, which includes stratified random sampling, cluster random sampling or combination among both techniques. The six selected higher institution in Niger State are Federal University of Technology Minna (FUT Minna), Niger State College of Education Minna (COE Minna), Federal Polytechnic Bida, and Ibrahim Badamosi Babangida University Lapai (IBBU), Federal College of Education Kotongora (FCE Kotongora), Niger State Polytechnic Zungeru was be purposely selected for study. Stratified sampling technique was used in selecting sample size for this study. By implication, the researcher arranged the list of element in each University into different strata based on gender (Male & Female) then, the required number were be selected for each stratum.

Research Instrument

To determine lecturers' awareness, readiness, perceived usefulness and challenges of using ERS for teaching at selected tertiary institutions in Niger State, A structured questionnaire was employed. The questionnaire items were structure to suit the set hypothetical problems. The questionnaire was designed and sectioned into different parts for easy understanding. Section A consists dealt with respondents' bio-data (name of institution & Gender), Section B focused on statement items on awareness ERS, Section C focused on readiness of using ERS , while Section D dealt with items on perceived usefulness of ERS. The Questionnaire adopted five-point Likert Scale. Each section has 10 questionnaire items with five opinions. Section A has Fully Aware rated as 5, Aware rated as 4, Undecided as 3, Not Fully Aware as 2, and Not Aware as 1. Section B was rated as: Fully Ready = 5, Partially Ready = 4, Undecided = 3, Ready = 2, Not Ready = 1. Section D was rated as: Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly Disagree = 1.

Validation of Instrument
The questionnaire was face and content validated three experts from Department of Science Education, Federal University of Technology, Minna. Based on the comments, corrections and advise of the experts, effort was made to ensure that the items were precise, clear and unambiguous.

Reliability of the Instrument
The instrument used was pilot tested. Five tertiary institutions Lagos state were randomly selected and a total of 50 questionnaires were administered. The respondents selected were not within the selected sample used for the final study but share similar characteristics in almost all respects. The institutions used for pilot testing were University of Lagos, Akoka; Caleb University, Ikorodu: Lagos State Polytechnic, Ikorodu; Adeniran Ogunsanya College of Education, Ijanikin; and Yaba College of Technology, Yaba. The questionnaire were distributed and personally retrieved by the researcher. The reliability value of 0.885 was achieved using Crobach Alpha which certifies that the instrument is reliable.

Method of Data Collection
The researchers with the help of research assistance administered the questionnaires and retrieved after the respondents completed them. Data collected on the basis of the research administered were analyzed using descriptive statistics (simple percentage) for analyzing the respondents' bio-data. Mann Whitney Non parametric statistics was used to test the hypotheses at 0.05 (95%) level of significant. The reasons for choosing this statistical technique was based on the nature of the data that was collected which is purely respondents' opinion.

Results
Analysis of Bio-Data of Institutions
Table 2: Frequency Distribution of Bio data of Respondents by Institutions

Institutions	Frequency	Percent (%)
Federal Polytechnic Bida	52	16.5
College of Edu. Minna	49	15.5
Federal University of Technology Minna	66	20.9
Federal College of Education Kontagora	45	14.2
IBB University Lapai	49	15.5
Niger state Polytechnic, Zungeru	55	17.4
Total	316	100

Table 2 showed that 316 (100%) of the respondents' bio data from each institution was collected.

Table 3:
Distributions of Respondents by Gender

Gender	Frequency	Percent
Male	221	69.9
Female	95	30.1
Total	316	100

Table 3 indicates that 221 (69.9%) were male lecturers in the six institutions while 95 (30.1%) where female lecturers' which shows that there are more of male respondents than female respondents.

Testing of Hypotheses
Ho₁: There is no significant difference between mean rating of male and female lecturers' opinions on the awareness of the use of clicker for teaching in tertiary institutions.
Table 4:
Mann-Whitney Test results of male and female lecturers on the awareness of the use of ERS for teaching

Test variable	N	Mean Rank	Sum of Ranks	U-calculated	P-value
Male	221	152.13	33621.50		
Female	95	173.31	16464.50	1.895	0.058[ns]
Total	316				

ns: Not significant at p>0.05

Table 4 shows the Mann-Whitney test and mean rankings 152.13 and 173.31 of male and female lecturers' opinions on the awareness of the use of ERS for teaching in tertiary institutions. Also, Mann-Whitney test showed U-calculated as 1.895 and the P-value of 0.058 which is greater than 0.05 of the alpha value. Therefore, hypothesis one is thereby not rejected. The result showed that there is no significant difference between male and female lecturers' opinions on the awareness of the use of ERS for teaching in tertiary institutions.

Ho₂: There is no significant difference between male and female lecturers' readiness in using ERS for teaching in tertiary institutions.

Table 5:
Mann-Whitney test results of male and female lecturers' opinion on the readiness to use ERS for teaching

Test variable	N	Mean Rank	Sum of Ranks	U-calculated	P-value
Male	221	156.12	34503.50		
Female	95	164.03	15582.50	0.707	0.479[ns]
Total	316				

ns: Not Significant at p>0.05

Table 5 shows the Mann-Whitney test with the mean rankings 156.12 and 164.03 of **male and female lecturers' opinions on** the readiness of the use of ERS for teaching in tertiary institutions. Also, Mann-Whitney test showed U-calculated as 0.707 and p>0.05, hence the hypothesis is not rejected. The result showed that there is no significant difference between **male and female lecturers' opinions on** the readiness to use ERS for teaching in tertiary institutions.

Ho₃: There is no significant difference between male and female lecturers' in perceived usefulness of ERS for teaching in tertiary institutions.

Table 6:
Mann-Whitney test results of male and female lecturers' opinion on the perceived usefulness of ERS for teaching

Test variable	N	Mean Rank	Sum of Ranks	U-calculated	P-value
Male	221	161.39	35668.00		
Female	95	151.77	14418.00	0.862	0.389[ns]
Total	316				

ns: Not significant at p>0.05

Table 6 shows the result of the Mann-Whitney test with the mean ranking of male and female lecturers' opinion on the perceived usefulness of ERS for teaching in tertiary institutions as 161.39 and 151.77 respectively. Also, Mann-Whitney test showed the U-calculated as 0.862 and p>0.05, hence the hypothesis was not rejected. The result showed that there is no significant difference between male and female lecturers' in perceived usefulness of ERS for teaching in tertiary institutions.

Discussion
The study revealed that there was no significant difference between male and female lecturers' awareness of using ERS for teaching in tertiary institutions in Niger State, Nigeria. This is finding is in agreement with that of Salehi and Salehi (2012) who reported that most respondents agree that lecturers' aware of the use of ERS for teaching in tertiary institution. This is in line with Smith and Doyle (2002) who related that new ICT tools make available a channel through which lecturers' can supplement their awareness of ERSr for teaching. The finding disagree with that of Dhanavandan, Mohammed and Mani (2006) who reported that the utilization of communication tools by the female respondents is relatively higher than the male respondents.
The study revealed that gender has no influence on Lecturers' **opinions on** the readiness to use ERS for teaching in tertiary institutions. This is not in agreement with Lina Markauskaite (2006) who reported significant difference between male and female ICT literacy and online learning. The study also revealed that gender as a factor does not influence lecturers' perceived usefulness of ERS for teaching in tertiary institution. This is in line with the finding of Elsaadani (2012) who reported that no significant difference between male and female participants' attitude toward ICT. Also, it support the finding of Dhanavandan, Mohammed and Mani (2006) who reported that no significant connection between the variables regarding the usage of e-mail and Internet on gender.

However, the finding of this study disagrees with that of Ejechi, (2013) who reported that ICT use was significantly better with men than women. Also, in disagreement with the finding of this study, Anunobi (2015) reported that male and female student lecturers have no substantial difference in the level of ICT usage.

Conclusion

The study highlighted some challenges in Nigerian tertiary institutions as regards the method of instructional delivery and over population of students in lecture hall which might be accounted for poor performance on the part of students and lack of good classroom management on the part of lecturers leading to poor teaching and learning. However, the use of electronic response system for teaching and learning is new in Nigerian educational systems. Based on lecturers' opinion on the awareness, readiness and perceived usefulness of Electronic Response System, it was found that gender has no influence on the awareness, readiness and perceived usefulness of male and female lecturers' on the use of electronic response system in tertiary institutions in Niger State, Nigeria.

Recommendations

Based on the finding of this study, the following recommendations are made:
(i)   Lecturers' should be giving opportunity to explore the use of electronic response system for teaching their course especially when handling large group of students.
(ii)   Lecturers' should be encouraged to use electronic response system to enhance effective teaching and learning in tertiary institutions. This could be achieved by providing enabling environment where electronic response system is provided with uninterrupted power source.

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DEVELOPMENT AND VALIDATION OF BIOLOGY MOBILE APPLICATION FOR NIGERIAN COLLEGES OF EDUCATION

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Abstract
The aim of this research was to develop and validate Biology Mobile Learning Application for Nigerian colleges of education: an emerging technology. In this study, mixed method quantitative pilot study design with qualitative components were used to test and ascertain the ease of development and validation of the Mobile Learning Application. ADDIE instructional system design model was adopted for developing the application. Convenience sampling technique was used in selecting the Mobile Application Developer and educational technology experts to validate the Mobile Application. Four validating instruments were employed in conducting this study: (i) Content Validation Assessment Report (CVAR); (ii) Mobile App Developer Expert Validation Assessment Report (MADEVAR); (iii) Educational Technology Experts Validation Assessment Report (ETEVAR); and (iv) Students Validation Questionnaire (SVQ). The face and content validation of all instruments were carried out. SVQ was pilot tested and reliability coefficient of 0.85 was obtained using Cronbach Alpha. CVAR, CEAR, ETEVAR were administered on content specialists, Mobile Application Developer experts, and educational technology experts, while SVQ was administered 20 NCE students in Niger State College of Education for field trial validation. The findings revealed that the process of design, development of Mobile app using ADDIE Instructional System Design was successful. Furthermore, reports from the validating team of experts revealed that the Mobile app is valid for learning of Biology at NCE level in Nigeria. It is therefore recommended that Mobile app should be made available to teach Biology concepts and where possible every student should be given a mobile device to facilitate learning.

Keywords: Design, Development, Validation, Evaluation, Mobile App, Biology, Emerging Technology.

Introduction

The adoption of science and technology in national life marks the beginning of development for any nation. Policy makers recognize its importance to both social and economic growth of a developed and developing country (Dusto, 2013). Science and technology leads to improved human potentials, capacity and subsequently elimination of reduction of poverty, inequality, unemployment and generally enhanced condition for human existence and self reproduction. Obayan (2002) states that what higher education should do for Nigeria is to provide her with critical mass of persons with analytical power, communicative skills, problem solving ability, team spirit, creative, versatility and lifelong learning skills who will act as a catalyst to national development. This among other reasons explains why many nations of the world strife to develop their science education sector (Ozturk, 2011).

One of the objectives of Colleges of Education in Nigeria is to produce the required number of qualified teachers in various disciplines. To achieve its objectives, there is need to keep pace with the changing environment around us, we have to look for new ways and methods of knowledge transfer and learning (Rabiee & Talebiyan, 2011). Biology is a natural science that deals with the living world, that is how the world is structured, how it functions and what these functions are, how it develops, how living things came into existence, and how they react to one another and with their environment (Umar, 2011). The study of biology thus provides an ideal preparation for wide range of careers ranging from basic science to engineering (Peter, 2015).

However, in spite of the importance of Biology as a basis for the many specialized sciences, science education, and social sciences in the educational system, performance at the pre-service progamme is not encouraging. Many departments in various Nigerian educational institutions are producing not so qualified graduates which have a negative chain effect in the economic, social and political development of the country. In some Colleges of Education in Nigeria, Biology department is a dumping ground for weak students (Akpochafo & Filho, 2008).

Adjudged from the above considerations, the general feeling is that faculties of education are failing in the production of quality teachers. Many researchers have identified poor instructional strategies, over population, inadequate funding and facilities, lack of committed lecturers and bad admission policies as causes of poor performance in education (Omoregie, 2005). Poor performance in tertiary institutions has also been linked to bad usage of mobile technology devices such as iPad, phones, among others (Park, 2011). Therefore, to keep pace with the changing environment around us, there is need to look for new ways and methods of knowledge transfer and learning.

New technologies (such as Web-based and mobile technologies) can provide large volumes of information and knowledge to learners to overcome the limitations of time and space.

Teaching and learning can only be effective if Information Communication Technology is given a place in Nigerian Classroom. If the technology applied for teaching and learning is richer, the faster, easier, better and more sustainable the learning becomes (Rabiee & Talebiyan, 2011; Khaghanizade & Shokrollahi, 2009). This will encourage student participation in learning process, enhance teamwork, more self-study, self education oriented teaching and learning through mobile technology devices such as iPad, smartphones, Tablet among others. The threat from using mobile technology devices for entertainments rather than for learning among undergraduate in Nigerian Colleges of Education has created the need for most lecturers to shift from age-long lecture method of teaching to mobile technology assisted learning. A review of performance of pre-service Biology teachers in the North-Central zone of Nigeria for five years (2010-2015), showed the poor trend in the performance of students. The percentage of students that passed science education courses especially Biology at Second Class Upper level and above was less than 40% for the past five years in Northern Central Zone of Nigeria. This observed poor performance is very discouraging and of great concern to Biology educators in Nigeria. The implication of this failure on education is that Nigeria may have a shortage of manpower in science and science education related disciplines. The causes of this problem could be traced to teaching strategies employed in tertiary institutions and under utilization of mobile technology devices in teaching and learning.

This study was therefore designed to develop, validate and evaluate mobile app for teaching biology practical in Nigeria Colleges of Education. In conducting this study, two objectives were formulated and two research questions were raised to guide the study. The procedures for development, validation and evaluation of Mobile App was reported using qualitative research while procedures for validating the effectiveness Mobile App was conducted using quantitative research in which data collected was analyzed, interpreted, discussed from which conclusion, recommendations and production of final report was made.

Statement of the Problem

The teacher-centred method of teaching employed by lecturers in tertiary institutions is one of the factors responsible for mass failure among undergraduates in Nigerian universities, therefore, there is need to change from teacher-centred to student-centred approach of teaching. Hence, there is urgent need to look for alternative instructional strategy such as mobile assisted learning. Learning with mobile devices which is one of student-centred approach has not been used for teaching and learning in Nigerian classrooms. However, undergraduate students mostly use Mobile App such as iPad, Tablet, Smartphones among others for entertainment such as watching movies; listening to music, playing games, taking pictures and many others. If this attitude persists, students will be addicted to wrong use of mobile devices for chatting and discussing irrelevant social issues. The resultant effect is that the students will not perform well in examination due to underutilization of Mobile App for learning. Consequent to this, students will lack the required knowledge and skills that will affect technological development of Nigeria. To overcome this negative implications, there is need to integrate Mobile App into teaching and learning process in Nigerian colleges of education to improve effective teaching and learning. It is a common belief that Nigeria is far behind in the use of mobile technologies for teaching and learning. For Nigeria to regain her rightful position in the committee of nations in teaching and learning there is the need to design, develop, validate and evaluate Mobile App (technologies) for undergraduate and NCE biology students.

Aim and Objectives

This study aimed at developing and validating of Biology Mobile Application for Colleges of Education students in Nigeria. The objectives of this study are to:
(i) Develop a Mobile App for teaching and learning biology concepts in Nigerian Colleges of Education
(ii) Validate the developed Mobile App for teaching and learning Biology concepts in Nigerian Colleges of Education.

Research Questions

The following research questions were raised to guide the study:
(i) How can Mobile App for learning Biology concepts in Nigerian Colleges of Education be developed?
(ii) How can the developed Mobile App for teaching and learning biology concepts in Nigerian Colleges of Education be validated?

Methodology

Research Design

This study adopted the Analysis, Design, Development, Implementation and Evaluation (ADDIE) Model of Instructional System Design (ISD). The model was used to develop a Mobile Learning Application for teaching NCE II Biology student in North-Central Nigeria.
The procedures include:
ADDIE is synonymous with the ISD process. In the present study, ADDIE has been defined as a conceptual framework of the ISD process. ADDIE is comprised of Analysis, Design, Development, Implementation, and Evaluation phases. It also provides a conceptual framework for the ISD process. ADDIE has been described as generic because other ISD models include the phases of ADDIE to some extent (Reiser, 2002). For example, all five phases of ADDIE have been included in the Dick and Carey ISD model (Dick & Carey, 1990, 1996; Dick et al., 2005).

Figure 1 shows a comparison between the ADDIE processes and the Dick and Carey model. In this figure the phases of ADDIE have been clearly represented in the Dick and Carey model (1990, 1996; Dick et al., 2005). The five phases of ADDIE, as defined by Seels and Glasgow (1998) are:

(i) Analysis: Collecting and analyzing data to determine needs, tasks and content, and instructional requirements. The process of defining what is to be learned.
(i) Design: The process of specifying how learning will occur.
(ii) Development: The process of authoring and producing the materials.
(iii) Implementation: The process of installing the process in the real world.
(iv) Evaluation: The process of determining the adequacy of instruction and learning.
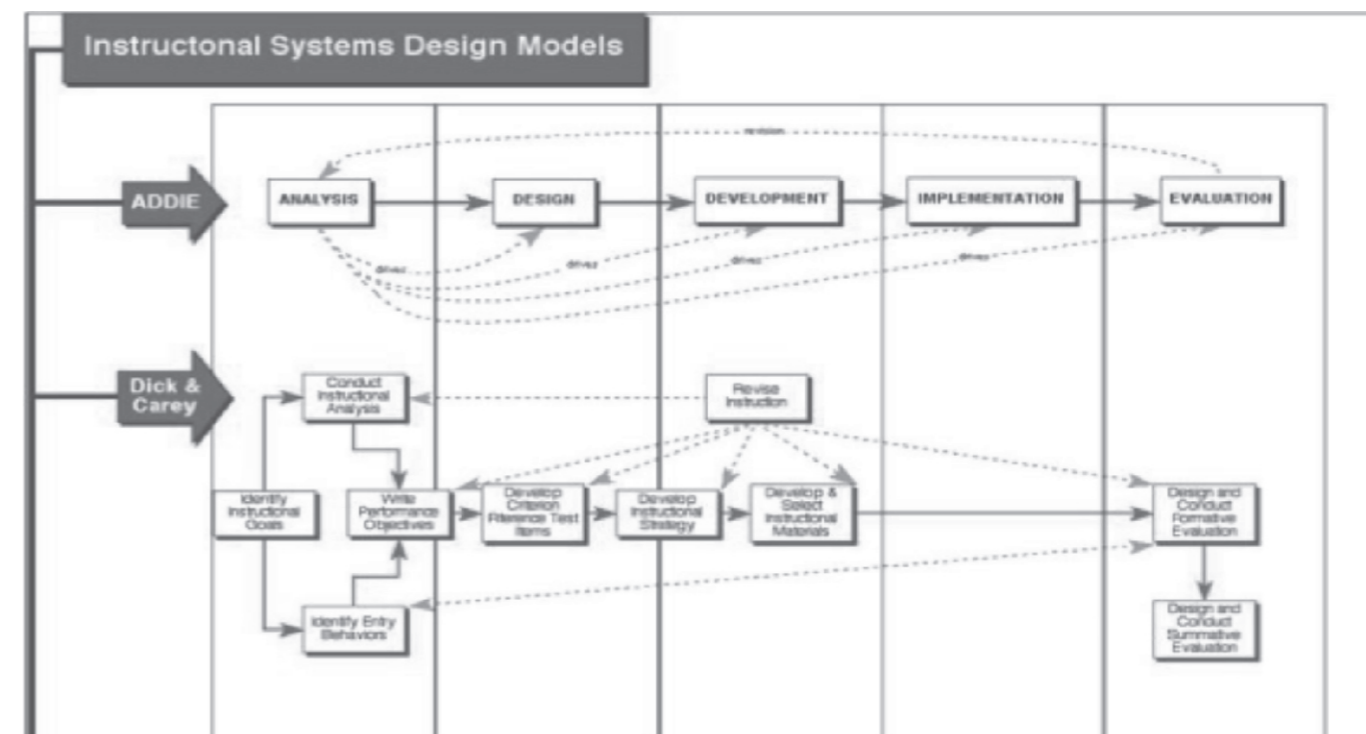
Figure 2: *Instructional systems design models*

There are several benefits of using a process to guide development. In general, ADDIE or any ISD model has helped people to "visualize the overall process" (Gustafson & Branch, 2002, p. 19). In addition, ADDIE has been utilized to establish guidelines and to manage the development process (Gustafson & Branch, 2002). Moreover, ADDIE does facilitate an important aspect of successful development: communication between the client and the developers (Gustafson & Branch, 2002).

Also, designers and practitioners of education should clarify the design paradigm shifts that this mode of delivery has introduced into the world of practice in order to ensure mobile learning is effective and efficient and the continuing needs of their students are being met (Dillard, 2012). In ensuring mobile learning effectiveness and efficiency in consonant with students' needs, evaluation of the content-user interface and other associating parameters is pertinent in the assessment system to meet the changing demands of quality assurance and quality improvement for learning resources as asserted to by Leacock and Nesbit (2007). However, Liu, Yang, Xiong, Yu, Ji, and Wang (2015) are of the opinion that the accelerating quantity and complexity of online resources is focusing attention on the inconsistent in instructional content quality evaluation.

Sample and Sampling Technique

The population for this research consist Biology students in Niger State College Education Minna, Biology lecturers, Mobile App Developer experts, educational technology experts. Furthermore, simple random sampling technique was used to select 20 NCE students for field trial validation of the Mobile App for learning. Convenient sampling technique was used to select three senior lecturers from Biology Department Niger State College Education, Minna and three senior lecturers from Biological Science Department Federal University of Technology Minna to validate the content Biology of College Education students. Purposive sampling technique was adopted to select three experienced Mobile App Developer experts from Computer Science and Cyber Security Departments and three Educational Technology lecturers from Educational Technology Department, Federal University of Technology, Minna and Kwara State University. Furthermore, simple random sampling technique was used to select Biology students from Niger State College Education minna, (n = 20) for field trial validation of the Mobile Application.

Research Instruments

Four research instruments were employed in conducting this study: (i) Content Validation Assessment Report (CVAR); (ii) Mobile App Developer Expert Validation Assessment Report (MADEVAR); (iii) Educational Technology Experts Validation Assessment Report (ETEVAR); and (iv) Students Validation Questionnaire (SVQ).

(I) Content Validation Assessment Report (CVAR): This instrument contains eight statements which respondents were required to write their comments after using the **Mobile App**. These include: appropriateness of the **Mobile App** for teaching the choosing topics; clarity and simplicity of the **Mobile App**; suitability for the level of the students; the extent to which the contents cover the topics; possible errors in the suggested answers; the structuring of the **Mobile App**; and other comments on the grammatical errors, misrepresentation of the symbols in the **Mobile App**, among others. Furthermore, a space for free comments was also provided. This instrument was given to three senior lecturers Biology Department Niger State College Education, for face and content validation of the **Mobile App** with regards to the officially prescribed content of National Council's of Colleges of Education (NCCE) curriculum.

(ii) Mobile App Developer Expert Validation Assessment Report (MADEVAR): This instrument contains nine statements which respondents were required to write their comments after using going through the Mobile App. These include: Appropriateness of the programming language used; typography errors in the Mobile App; legibility of the Mobile App; the navigation; interface; animations and graphics in the Mobile App; functionality of the Mobile App; the storage, speed and durability of the Mobile App; and the appropriateness of the applications. **MADEVAR** was given to three (3) lecturers from Computer Science and Cyber Security (programmers) Departments, Federal University of Technology, Minna for experts' validation after they had gone through the Mobile App.

(iii) Educational Technology Expert Validation Assessment Report (ETEVAR): This instrument consists of seven statements which respondents were required to write their comments going through the Mobile App. These include: suitability of the Mobile App for instruction; clarity and simplicity of the Mobile App; unity among illustrations; emphasis on key concepts; the use of colours (background and font colours); the legibility of the text (font type and size); and others such as audibility of the audio, animation, etc. ETEVAR was given to three (3) educational technology experts from Educational Technology Department, Federal University of Technology, Minna and Kwara State University Ilorin, for the purpose of finding out whether the Mobile App conforms to acceptable standards in educational technology.

(iv) Students Validation Questionnaire (SVQ): The instrument contains six section (A-F) and each section contains five statement items which respondents were required to state whether they strongly agreed, agreed, disagreed, strongly disagreed respectively. Section A contains five-item on content in the Mobile App; section B has five-item on interactivity of the Mobile App; Section C consists of five-statement navigation of the Mobile App; Section D contains five-item on feedback from the respondents after using the Mobile App; Section E has five-item that deals with screen design of the Mobile App; while Section F contains five-statements on students' preferences toward the use of the Mobile App to traditional method of teaching.SVQ **was** administered on 20 students who were randomly selected for field trial validation of Mobile App.

Method of Data Collection

Data were collected in two ways using qualitative and quantitative methods. Qualitative data on Mobile App were collected from Biology Lecturers from COE Minna, Mobile app Developer, Educational Technology experts. The experts responded to statements in: (i) Content Validation Assessment Report (CVAR); (ii) Mobile App Developer Expert Validation Assessment Report (MADEVAR): (iii) Educational Technology Experts Validation Assessment Report (ETEVAR) respectively. The quantitative data were also obtained from 20 selected students using Students Validation Questionnaire (SVQ).

Data Analysis Technique

Research question one was answered by explaining the steps involves in developing Mobile App. Research question two was answered using qualitative data and quantitative data. The summary of comments and recommendations from experts on validation were reported, while responses from students from field trail validation were analyzed using descriptive statistics of mean and standard deviation. In taking decision from the analyzed data, an average mean of 2.50 and above were considered as agreed, while an average mean of 2.49 and below was considered disagreed with respect to the research questions. A mean of 2.5, according to David (2005), was used as a criterion to judge mean scores for a modified four- point item format. The mean of 2.5 was calculated from the sum of 4+3+2+1 divided by 4.

Results

Research Question one: What are the steps involved in the development of **Mobile App** App for learning biology concepts in Nigerian Colleges of Education?
students in Nigeria?

This study adopted the five phases of ADDIE which include: Analysis, Design, Development, Implementation and Evaluation.

Phase One: The first stage is to determine the instructional needs, tasks, content and requirements for NCE II students in North Central Nigeria through Collection and analysis of performance data of five academic sections (2009/2010-2014/2015). This helped in identifying the difficult course (Bio 225) and previous knowledge of NCE II students. In conducting the instructional analysis, methods of instructional delivery for teaching Biology at NCE level were identified. These include: the facilities, equipment, manpower and infrastructure available for instructional purposes. In developing instructional strategy, justification for using Mobile application, were identified. The necessity for developing Mobile application was based on the fact that there were no available commercially produced Mobile application for Bio 225 and were available on the Internet they were in bits and not as a whole course to cover the curriculum content. Over population and use of lecture method were identified as some of the problems for poor performance at NCE level for teaching of biology as a course in North Central colleges of education in Nigeria. Hence, the need for developing Mobile Learning Application for the identified course using NCCE curriculum to solve these instructional problem.

Phase Two: In writing the performance objectives for identified course, the the contents of each topic were highlighted and structured from simple to complex, known to unknown, abstract to concrete, with 70% coverage of Bio 225. In this study, the objectives were formulated using table of specification for each topic and scripts were also written on each of the topics from a formulated course material.

Phase Three: In developing Mobile Learning Application for Bio 225; the researcher after going through three month training in Mobile Application Development, with the help of a Mobile application developer, used the scripts and selected instructional content to develop a Mobile Application for BIO 225 named "Holanike Mobile App,"with strict adherence to usability guideline principles (Kantore, 2011). The mobile app was developed using Android studio, V.1.4.1 which is online/offline compatible. The Android studio after being properly installed on the computer system was launched. The programmers click on the new project icon on the menu bar and then choose android application among the list of available packages. After going through the complete process of development, it was then exported on mobile phones, test-run for proper functioning and possible corrections.

In developing assessment instrument, various instruments were used to determine the functionality and validity of Mobile application. In this study, (i) Content Validation Assessment Report (CVAR); (ii) Mobile Application Developer Expert Validation Assessment Report (MADEVAR); (iii) Educational Technology Experts Validation Assessment Report (ETEVAR); and (iv) Students Validation Questionnaire (SVQ) were developed.

Phase Four: In implementing the developed Mobile Application, it was subjected to field trial testing on small sample of the population of end users; problems were pointed for instance formatting typographical errors and other issues. Necessary corrections were made to produce the final Mobile App.

Phase Five: In conducting evaluation, each phase was evaluated before…. This include: content validation, experts' validation, student validation, field trial validation among others. Finally, revision of the instruction was done. Each step was revised and all the necessary amendments were made based on validation assessment reports and recommendations from experts and students. The researcher checked performance objectives and follow the loop again until the Mobile application met the standard.

Research Question Two: How was the developed Mobile Learning Application in Nigeria validated?
The validation of Mobile Learning Application was done in three stages: (i) content validation (basic technology specialists),(ii) experts validation (computer programmers &educational technology experts), and (iii) field trial validation (students' representative).
(I) Content Validation: this was divided into two stages: (a) content validation of the course material, (b) content validation of Mobile Learning Application.

(a) Content Validation of the Course Material: After developing the contents of selected difficult concepts in Biology, three senior lecturers were given the content to validate using Content Validation Assessment Report (CVAR). They assessed the appropriateness of the Mobile Learning Application content for teaching the Biology, clarity and simplicity of the contents, suitability for the level of the students, the extent to which the contents cover the topics they are meant to cover, possible errors in the suggested answers, the structuring of the Mobile Learning Application among others before the Mobile Learning Application was developed. They ascertained that the contents complied with NCCE curriculum. They also ensured that all question items were derived from the course outline.

(b) Contents Validation of Mobile Learning Application Courseware: The contents of the Mobile Learning Application were validated by three senior lecturers from Biological Science and microbiology department, Federal University of Technology Minna using Content Validation Assessment Report (CVAR). They examined the contents of the Mobile Learning Application whether it adequately and sufficiently cover the NCCE curriculum. After the validation, some sentence errors, spelling mistakes and misrepresentation of some symbols, paragraphs and formatting errors were discovered in the Mobile Learning Application and were corrected. The test items and contents of the Mobile Learning Application were also corrected based on the suggestions and recommendations of the experts.

(ii) Experts Validation: this was done in two stages: (a) Mobile Learning Application Developer Experts Validation, (b) Educational Technology Experts Validation.

(a) Mobile Learning Application Experts Validation: The developed Mobile Learning Application was validated by three Mobile Learning Application experts (from Computer Science and cyber Security Departments) to validate using Mobile Application Developer Expert Validation Assessment Report (MADEVAR).They examined the appropriateness of the Mobile Application in terms of language, typography, legibility, navigation, interface, animations/video, functionality, packaging, and durability. Their suggestions and recommendations were used for modifying the Mobile Learning Application.

(b) Educational Technology Experts Validation: Two Educational Technology experts from Kwara State University Ilorin and one from Federal University of Technology Minna validated the Mobile Learning Application by looking at: its suitability for instruction, simplicity, unity among illustrations, and emphasis on key concepts, colour use, and text. In addition, three Biology lecturers also validated the Mobile Learning Application in terms of its appropriateness for teaching the topics, clarity and simplicity of the Mobile Learning Application, suitability for the level of the students, the extent to which the contents cover the topics they were meant to cover, possible errors on the suggested answers, the structuring of the Mobile Learning Application and others. Furthermore, comments and recommendations on font types and sizes were affected by changing the font type to legible one and increase the font size moderately. Also, some background colours that seem to be distractive were changed. All the experts' comments were used to improve the Mobile Learning Application.

(iii) Field Trial Validation: The Mobile Learning Application was trial-tested on some 20 Junior. They were allowed to use the Mobile Learning Application.. The purpose of field trial validation is to confirm the functionality of the Mobile Learning Application. After three weeks of exposure to Mobile Learning Application, 30-item Students' Validation Questionnaire (SVQ) was administered to the students exposed to Mobile Learning instructional and retrieved immediately and analyzed as shown in Table 1-6.

Table 1:
Content in the Mobile Learning Application

S/No	Statement	Mean	SD	Decision
1	The messages in the Mobile Learning Application a re easy to understand.	3.70	0.47	Agree
2	The content of the Mobile Learning Application has been well organized (arranged in order).	3.60	0.50	Agree
3	The diagrams/illustrations in the Mobile Learning Application are very clear to me.	3.70	0.47	Agree
4	The examples used in the various sections of the lessons in the Mobile Learning Application are relevant.	3.50	0.51	Agree
5	It was easy to understand the lesson because information was presented from simple to more difficult one.	3.45	0.51	Agree
Cumulative Mean		**3.59**		

Decision Mean = 3.59

Table 1 shows the cumulative mean of 3.50 for students' opinions of the content in the Mobile Learning Application. This implies that students agree that content in the Mobile Learning Application is adequate. This is because the cumulative mean 3.50 is greater than the decision mean of 2.50.

Table 2:
Interactivity of the Mobile Learning Application

S/No	Statement	Mean	SD	Decision
6	It is easy to operate the Mobile Learning Application with navigating tools and icons available on mobile phone.	3.65	0.49	Agree
7	This Application permits me to repeat the section, enlarge animation, and exit the lesson at any time.	3.90	0.31	Agree
8	The frequent display of questions to the learners does not interrupt the learning process.	3.55	0.51	Agree
9	This Application enables me to apply what I have learnt rather than memorize it.	3.80	0.41	Agree
10	This Application allows me to discover information through active learning.	3.70	0.47	Agree
Cumulative Mean		**3.72**		

Decision Mean = 3.72

Table 2 shows the cumulative mean of 3.67 for students' opinions of the interactivity of Mobile Learning Application. This implies that students agree that the interactivity of the Mobile Learning Application are adequate. This is because the cumulative mean 3.67 is greater than the decision mean of 2.50.

Table 3:
Navigation of the Mobile Learning Application

S/No	Statement	Mean	SD	Decision
11	From the main menu, learners are allowed to register his/her name.	3.95	0.22	Agree
12	The menu key enab les me to exit from the lesson/programme.	3.85	0.37	Agree
13	The back key enables me to revisit the previous section(s) of the lesson.	3.90	0.31	Agree
14	The NEXT key directs me to go to the next section of the lesson.	3.80	0.41	Agree
15	The OPTION keys allow me to select the correct option.	3.90	0.31	Agree
Cumulative Mean		**3.88**		

Decision Mean = 3.88

Table 3 shows the cumulative mean of 3.88 for students' opinions on the navigation of the Mobile Learning Application This implies that students agree that the navigation of the Mobile Learning Application are adequate. This is because the cumulative mean 3.88 is greater than the decision mean of 2.50.

Table 4: Feedback from the Mobile Learning Application

S/No	Statement	Mean	SD	Decision
16	This Mobile L earning Application provides immediate feedback after selecting the option.	3.50	0.51	Agree
17	This Mobile Learning Application displays the correct or wrong answer chosen with some sound.	3.30	0.47	Agree
18	This Mobile Learning Application courseware allows me to proceed to the next lesson only if the chosen answer is correct.	3.85	0.37	Agree
19	This Mobile Learning Application terminates my activities if after three attempts I got the answer wrong.	3.10	1.31	Agree
20	This Mobile Learning Application appreciates my efforts by congratulating me after completing the lesson correctly.	3.80	0.41	Agree
Cumulative Mean		**3.51**		

Decision Mean = 3.51

Table 4 shows the cumulative mean of 2.99 for students' opinions on the feedback from Mobile Learning Application. This implies that students agree that the feedbacks from Mobile Learning Application are adequate. This is because the cumulative mean of 2.99 is greater than the decision mean of 2.50.

Table 5:
Screen Design of the Mobile Learning Application

S/No	Statement	Mean	SD	Decision
21	The presentations of the information in the Mobile Learning Application attract my attention.	3.80	0.41	Agree
22	The use of proper lettering (fonts) in terms of style and size make the information legible.	3.85	0.37	Agree
23	The colours used for the various presentations are quite appealing.	3.90	0.31	Agree
24	The quality of the text, images, graphics and video are interesting.	3.85	0.37	Agree
25	The animations (moving picture) in the Mobile Learning Application assist in understanding the lessons better.	3.60	0.60	Agree
Grand Mean		**3.80**		

Decision Mean = 3.80

Table 5 shows the cumulative mean of 3.79 for students' opinions on the screen design of the Mobile Learning Application. This implies that students agree that the screen designs of Mobile Learning Application are adequate. This is because the cumulative mean of 3.79 is greater than the decision mean of 2.50.

Table 6:
Students' Preferences toward the Use of the Mobile Learning Application

S/No	Statement	Mean	SD	Decision
26	I prefer to learn Biology with Mobile Learning Application with a teacher acting as a facilitator.	3.70	0.47	Agree
27	Learning Biology with Mobile Learning Application is more preferable than using text books.	3.80	0.41	Agree
28	The activities provided in this Mobile Learning Application are more effective compared to normal classroom instruction.	3.90	0.31	Agree
29	I will suggest to my friends to use Mobile Learning Application in learning Biology instead of textbooks.	3.70	0.47	Agree
30	I p refer the use of this instruction method than normal classroom instruction.	3.75	0.44	Agree
Cumulative Mean		**3.77**		

Decision Mean = 3.77

Conclusion

This study demonstrated the steps in developing mobile application for colleges of education in Nigeria. It also gives detailed reports on stages of validating the mobile application. For successful design of Biology mobile Application, ADDIE Instructional Model was adopted. This involved Analysis, Design, Develop, Implementation and Evaluation phases. After the completion, it was subjected to three stages of validation which include: content validation, experts' validation and field trial validation of the App. The contents specialist reported that the contents covered were adequate and suitable for Colleges of Education curriculum in Nigeria. The Computer Experts affirmed that the programming language used, navigation, interface, animation, and other features are in line with the standard of software development, while the Educational Technology experts reported that simplicity, clarity, unity among illustrations, and emphasis on key concepts, colour use, and font type and sizes were adequate. During the field trial validation, the selected group of students exposed to Biology Mobile Application, agreed that the Biology contents of the Mobile App, the interactivity, navigation, feedback mechanism and screen design of the App were properly developed. They prefer using Mobile Application mode of instruction than conventional method being used.

Recommendations

Based on the findings and conclusions, it was recommended that:
(i)   Developers of Mobile Learning App should ensure that IDDIE Model or similar ISD Model is fully implemented. This will serve as a guide towards developing a quality of Mobile Learning App.
(ii)   Content specialists and experts' validation reports should be properly followed towards developing a standard of mobile learning App.
(iii)   Biology lecturers should imbibe the spirit of using of Mobile Learning for teaching their students in order to be to update technologically.
(iv)   Mobile learning collaboratively in nature, therefore mobile learning app developers should involve subject specialists, computer programmers, educational technology experts, and students in the process of developing and validating mobile learning to ensure high interactivity and users-friendliness of such application;
(v)   Colleges of education in Nigeria should embrace and support the use of mobile learning in their schools as this will enhance students' performance in Biology and science related subjects. Therefore, government and non-governmental organizations should provide ICT infrastructure for effective development and utilization of mobile learning app.
(vii)   Parent or guardian should purchase smartphones, Androids, windows phone, textbooks among others for their children to use collaboratively on individually in school, home and at their preferred time and pace of learning.

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TECHNOLOGY EDUCATION STUDENTS' USE OF WEB-BASED INSTRUCTION FOR LEARNING: A CASE OF UNIVERSITY OF ILORIN, NIGERIA

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Abstract
Web-based instruction is an innovative teaching strategy to both regular and distance learners, using the web as the custodian of learning materials to create meaningful and productive learning experiences. Nevertheless, the efforts need to be intensified in its utilization. Therefore, this study investigated the technology education students' use of web-based instruction for learning in the university of Ilorin, Nigeria. The population for the study comprised all undergraduate students in University of Ilorin, Nigeria. Target population for the study is all undergraduate students in Faculty of Education, University of Ilorin, while 150 technology education students of the Department Educational Technology were randomly sampled. Descriptive survey research type was adopted and a 4-point Likert-type scale questionnaire was used. Thus, six research questions and three hypotheses were answered and tested using mean and t-test statistical tool respectively. The findings revealed among others that, technology education students use web-based instruction for learning with the mean rating of 3.27, using 2.5 as the benchmark. It was concluded among others that, technology education students agreed that web-based instruction can be used for learning. The research recommended among others that, technology education students should be encouraged to sustain the use of web-based instruction for learning.

Keyword: Web-based instruction; Technology Education; Gender; University of Ilorin.

Introduction

Education remains an instrument of change and national development. It is a social process and the medium for the acquisition of relevant knowledge, skills and attitudes for survival in a changing world. In the Nigeria education continuum, basic education as the foundation requires a sound knowledge of science and technology. According to National Policy on Education (FRN, 2013) a nation cannot achieve greatness unless she directs her efforts in technology to develop the resources in the country. Because of its importance, many nations of the world introduce technology early to children in developing countries such as Nigeria, science and technology is taught in schools for general literacy and as preparation for future activities in related fields.

Technology is the application of knowledge to the practical aims of human life or to changing and manipulating the human environment. Technologies include the use of materials, tools, techniques, and sources of power to make life easier or more pleasant and work more productive. Technology is a way and manner through which human beings produce the basic needs of life such as food, clothing, shelter, communication, transportation, sound health, security and so on, in order to ease their daily activities. **Technology involves a practical engagement, that is, the act of doing.** Integration of technology in teaching and learning is a means of attracting the attention of students whose concentration spans are so short due to their television and video game background; they may react better to visually stimulating material (Martinez, 2009).

Therefore, training of citizenry through technical education in Nigeria would lead to self-reliance and sustainability and as such mounts direct impacts on the welfare of the entire citizenry. Perhaps, more than any other aspect of educational system and in line with the economic realities of our time, the roles and importance of vocational and technical education as a catalytic agent to the overall growth of economy and national development cannot be under estimated. With vocational and technical education, possession of skills and knowledge mastery implies a substantial benefit to every individual and the society at large. It therefore implies that technical education can serve as change agents both in the field of technology and other societal needs.

Literature Reviewed

Technology plays vital responsibility in transforming human living and its entire environment, which has resulted in more meaningful living standard. In addition, it has a power to transform the teaching and learning process. Technology can be described as the entire use of human and non-human resources by means of technique to ease the burden of daily activities in human endeavours. Technology is used to support communication with learning and instructional materials. It makes students to be active rather than inactive participants as receivers of information conveyed by the teacher, textbook, video based instruction, internet, and so on (Fajemirokun, 2003). Technology offers varieties of technological devices, which are used to facilitate teaching and learning processes.

The advent of the web based instruction has a tremendous effect on the way the learners interact the learning experiences (Mathew & Dohery-Poirier, 2000).
The mission for the development of any nation calls for the emphasis on technical education. According to Ogbu (2015), technical education refers to the form of training for engineering, manufacturing and technical occupations. Technical education involves innovations of student preparations, in such trades as welding, carpentry and joinery, painting and decoration mechanics, machining, electronics, among others. The responsibility of the preparation of the teachers of technical education lies on the various programmes designed to achieve the aims and objectives of technical education, in other to achieve the stated aims and objectives of technical education as enshrined in the National Policy on Education (FRN, 2013).

Folorunsho (2002) emphasized that the provision of adequate learning equipment is vital to the production of well-educated mind. However, the major problem encountered by teachers and students is due to inadequate supply of equipment and facilities in the teaching of technology education causes. Thus, technology education needs to be handled using web based instructional strategy, where students would be exposed to all forms of innovative technology devices such as information and communication technology (ICT) and deep knowledge of learning experiences.

The National Policy on Education (FRN, 2013) stressed the necessity for integrating ICT across all levels of education. Ogunlade (2014) opined that information and communication technology refers to the means of achieving, processing and dispensing message by merging computers and telecommunication skills and procedures. It was emphasized further that ICT can be used to offer predicted results with little error or faultless, firm, consistent and interactivity in learning. The achievement of technology in education is ultimately developed to advance the strategy in the utilization of ICT. Hence, the most commonly reason for using ICT in education has been to prepare the students to tackle future encounters where ICT devices encourage the quality of education by increasing learners' engagement and inspiration, enabling the attainment of basic skills and facilitating teacher education programme (Amosa, Ogunlade, Ogunlade & Obielodan, 2016).

The web-based instruction offers instructional backing, which encourages learning effectiveness within and outside classroom setting. It provides meaningful learning experiences, which are open, unrigid, disseminated and, affords opportunities for appealing, collaborative and resourceful instruction (Kahn, 2001). Web based instructional strategy, which is a tool of ICT, has tremendous values on the teaching technology courses. This influence is even more vital in realizing the vocational and technical through innovative technology devices, which take into consideration the demands of the development of the nation at large. The inadequacies of the current dearth in the information and communication technology are relatively accounted for the parents and students' attitude towards learning technology oriented courses at all levels of education. The future of the developing countries like Nigeria depends on continue technological development, and this can only be achieved when technology education students show keen interest towards innovative technological devices such as web based instruction.

The goals of vocational and technical as enshrined in the Nigeria Policy on Education (FRN, 2013) further include the following:

a. Provide the trained manpower in the applied sciences and business particularly at craft, advance and technical levels;

b. Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and

c. Give training and impart the necessary skills to individuals who shall be self-reliant economically.

Aldridge (2013) opined that web based instructional strategy providers should provide sufficient technical supports, which should be available for the learners to become active participants. *Utilization of web based instruction as an instructional strategy encourages teachers, instructors, and trainers to integrate it into their day to day educational endeavour. Therefore, their interactions to learning materials becomes usable at both in and outside the classroom. Since the students are ranges of different abilities, background and previous knowledge, web based instruction can be used to address such varieties of the students' demands. This instructional strategy permits students to work at their respective pace, which is the best means of catering for the individual differences.*

Irrespective of gender, utilization of web based instruction for learning allows learners from being passive participants to active participants, since such instructional strategy caters for the individual differences of learners. In addition, students' readiness to learn is encouraged if their access to the learning materials can be at their own pace. The web based instruction offers instruction and instructional support. Web-based instruction provides learners incomparable access to instructional resources, far exceptional range of the conventional classroom. Furthermore, it improves likely learning experiences, which are open, flexible, circulated, encourages opportunities for engaging, collaborating, and resourceful instruction (Kahn, 2001). Apart from the fixed resources in traditional CBI, Web based instruction offers the suitably modified and restructured, readily accessed, and rapidly associated with the related sources of knowledge, hence creating a support for "anytime, anywhere" learning experiences (Fletcher & Dodds, 2001).

Purpose of the Study

The main purpose of this study was to investigate the technology education students' use of web-based instruction for learning in the university of Ilorin, Nigeria. Specifically, the study:

1. Investigated technology education students' perception on the use of web-based instruction for learning;

2. Examined the technology education students' perceived ease of use of web-based instruction for learning;

3. Examined the technology education students' perceived usefulness of web-based instruction for learning;

4. Investigated technology education students' perception on the use of web-based instruction for learning based on gender;

5. Examined the technology education students' perceived ease of use of web-based instruction for learning based on gender; and

6. Examined the technology education students' perceived usefulness of web-based instruction for learning based on gender.

Research Questions

The following research questions were answered in this study:

1. What is the perception of technology education students on the use of web-based instruction for learning?
2. What is the perception of technology education students on the ease of use of web-based   instruction for learning?
3. What is the perception of technology education students on the usefulness of web-based instruction for learning?
4. Is there any difference between male and female technology education students' perception on the use of web-based instruction for learning?
5. Is there any difference between male and female technology education students' perceived ease of use of web-based instruction for learning?
6. Is there any difference between male and female technology education students' perceived usefulness of web-based instruction for learning?

Research Hypotheses

The following hypotheses were tested at 0.05 level of significant

Ho_1: There is no significant difference between male and female technology education students' perception on the use of web-based instruction for learning.

Ho_2: There is no significant difference between male and female technology education students' perceived ease of use of web-based instruction for learning.

Ho_3: There is no significant difference between male and female technology education students' perceived usefulness of web-based instruction for learning.

Methodology

The population for this study consisted of all undergraduates' students of the University of Ilorin, Nigeria, while target population consisted all undergraduate students in the Faculty of Education, University of Ilorin, thus 150 technology education students of educational technology from the Department of Educational Technology, University of Ilorin were randomly sampled for the study. The instrument for this study was researchers–designed questionnaire entitled 'technology education students' use of web-based instruction for learning in the university of Ilorin, Nigeria' Descriptive survey research type was adopted, using the 4-point Likert Scale response modes: Strongly Agree (SA - 4), Agree (A - 3), Disagree (D - 2) and Strongly Disagree (SD - 1). The research questions one (1) to three (3) were answered by converting frequencies to mean, while research questions four (4) to six (6) were answered through the corresponding hypotheses one (1) to three (3). Thus, the research questions and research hypotheses were answered and tested using mean rating and t-test statistical tool respectively. All hypotheses were tested at (0.05) level of significance.

Results

This section presents the analysis and interpretation of data collected for this study. Data obtained in respect of research questions were analyzed using mean and the research hypotheses were tested using t-test.

Demographic Data

Table 1:
Respondents based on Gender

Technology Education Students	Frequency	Percentage (%)
Male	82	54.7
Female	68	45.3

Table 1 reveals that 82 technology education students representing 54.7% of the respondents were male students while female students were 68 respondents representing 45.3% making a total of 150 respondents and 100% respectively. This shows that both male and female technology education students were represented in the study.

Research Question 1: What is the perception of technology education students on the use of web-based instruction for learning?

Table 2:
Analysis of technology education students' perception on the use of web-based instruction for learning

SN	Items	Mean
1	I always use web-based instruction (WBI)	**3.27**
2	I use WBI to provide a wealth of information that is not really available in technology education textbook	3.34
3	I use WBI to access information and resources from around the world in my discipline	3.38
4	WBI can be interactive and collaborative in nature resulting in what many call a global community	3.40
5	I use WBI to have access to a large quality of meaningful and relevant information	3.30
6	Web-related instructional activities increase students' motivation and self-esteem	3.23
7	I use WBI for significant flexibility in the delivery of non-linear course material in my field	3.11
8	Since the introduction of WBI I now access the course ware materials before my lectures	3.17
9	The use of WBI tools is very effective to my study	3.26
10	I integrate WBI to make learning interesting and understandable for me in my field of study	3.26
	Grand Mean	**3.27**

Based on the results in Table 2, it was revealed that technology education students use web-based instruction for learning with the mean rating of 3.27, using 2.5 as the benchmark. There are indications from the responses in items 1 – 10 that they are used to the utilization of web-based instruction.

Research Question 2: What is the perception of technology education students on the ease of use of web-based instruction for learning?

Table 3:
Analysis of technology education students on the ease of use of web-based instruction for learning

S/No.	Items	Mean
1	Using WBI in my discipline would be easy for me	3.45
2	WBI is friendly and flexible to interact with	3.16
3	Learning to operate WBI would be an easy task	3.05
4	It would be easy to adopt WBI to do whatever task I intend	3.04
5	My ability to determine WBI ease of use is limited by lack of experience	2.95
6	Using WBI in my study would enable me to accomplish more task	3.26
7	I believe that working with WBI tools is very difficult	2.40
8	If I had an opportunity to take a course web-based instruction, I would gladly do so	3.24
9	Learning with WBI could be interesting and lively	3.31
10	It is convenient to use WBI for learning	3.21
	Grand Mean	3.10

Based on the results in Table 3, it was confirmed by technology education students that the use web-based instruction for learning is easy and friendly to interact with, considering the mean rating of 3.10, using 2.5 as the benchmark. There are indications from the responses in items 1 – 10 that they find it easy to use.

Research Question 3: What is the perception of technology education students on the usefulness of web-based instruction for learning?

Table 4:
Analysis of technology education students' perception on the usefulness of web-based instruction for learning

S/No	Items	Mean
1.	Using WBI in my discipline would help me to accomplish tasks more quickly	3.56
2.	WBI improves my academic performance	3.26
3.	Using WBI in my study would increase my learning productivity	3.32
4.	Using WBI would offer varieties of contents, which enhances learners' retention of learning experiences	3.32
5.	Using WBI would make it easier to do my work	3.27
6.	I would find WBI useful in my discipline	3.35
7.	WBI will be counterproductive due to insufficient technical supports	3.37
8.	Getting material on WBI allowed me to arrange my work for the class more effectively	3.17
9.	Taking a course through WBI is preferable to conventional method	2.58
10.	The use of WBI has no relevance to my discipline	2.14
	Grand Mean	**3.13**

Based on the results in Table 4, it was established that technology education students agreed that web-based instruction is useful for learning with the mean rating of 3.13, using 2.5 as the benchmark. There are indications from the responses in items 1 – 10 that web-based instruction enhances and facilitates learning.

Hypotheses Testing
H_{01}: There is no significant difference between male and female technology education students' perception on the use of web-based instruction for learning.

Table 5:
Significant difference in the opinion of male and female technology education students on the use of web-based instruction for learning

Gender	No	Mean	SD	df	T	Sig (2-tailed)	Remarks
Male	82	32.87	3.79				
				148	.583	.561	Accepted
Female	68	32.32.5	3.8				
Total	150						

From Table 5, it could be deduced that the *t*-value = .583, with *p*-value of .561 > 0.05 alpha level. This implies that the null hypothesis one, which states that there is no significant difference between male and female technology education students' perception on the use of web-based instruction showed no significant difference. Hence, the hypothesis one was accepted. Therefore, there was no significant difference between the perception of male and female technology education students on the use of web-based instruction for learning.

H_{02}: There is no significant difference between male and female technology education students'   perceived ease of use of web-based instruction for learning.

Table 6:
Significant difference in the perception of male and female technology education students on the ease of use of web-based instruction for learning

Gender	No	Mean	SD	Df	T	Sig (2-tailed)	Remarks
Male	82	32.87	3.79				
				148	.604	.547	Accepted
Female	68	32.32.5	3.8				
Tota	150						

From Table 5, it could be deduced that the *t*-value = .604, with *p*-value of .547 > 0.05 alpha level. This implies that the null hypothesis two, which states that there is no significant difference between male and female technology education students' perception on the ease of use of web-based instruction showed no significant difference. Hence, the hypothesis two was accepted. Therefore, there was no significant difference between the perception of male and female technology education students on the ease of use of web-based instruction for learning.

H_{03}: There is no significant difference between male and female technology education students' perceived usefulness of web-based instruction for learning.

Table 7:
Significant difference between male and female technology education students' perception on the usefulness of web-based instruction for learning.

Gender	No	Mean	SD	Df	T	Sig (2-tailed)	Remarks
Male	82	32.87	3.79				
				148	1.308	.193	Accepted
Female	68	32.32.5	3.8				
Total	150						

From Table 7, it could be deduced that the *t*-value = 1.308, with *p*-value of .193 > 0.05 alpha level. This implies that the null hypothesis three, which states that there is no significant difference between male and female technology education students' perception on the usefulness of web-based instruction showed no significant difference. Hence, the hypothesis three was accepted. Therefore, there was no significant difference between the perception of male and female technology education students on the usefulness of web-based instruction for learning.

Summary of Major Findings
Based on the analysis of responses of the students, it was revealed that:
1.   Technology education students agreed that web-based instruction can be used for learning.
2.   Technology education students responded that web-based instruction is user friendly and easy to use for learning.
3.   Technology education students indicated that the use of web-based instruction has a tremendous value on learning. Thus, it enhances and facilitates learning.
4.   There was no significant difference between male and female technology education students' perception on the use of web-based instruction for learning.
5.   There was no significant difference between male and female technology education students' perception on the ease of use of web-based instruction for learning.
6.   There was no significant difference between male and female technology education students' perception on the usefulness of web-based instruction for learning.

Discussion
        Technology education students' perception on the use of web-based instruction for learning was investigated in research question one. Hence, the result of the mean value established that technology education students agreed that the utilization of web-based instruction can be used to learn. Also, research question two investigated the ease of use of web-based instruction among technology education students. Thus, the results of the mean value this research question indicated that the ease of use of web-based instruction is guaranteed. Research question three examined the perception of technology education students on the usefulness of web-based instruction for learning. The result of this research question submitted that the students confirmed the usefulness of web-based instruction for learning. From the corresponding hypotheses, hypotheses 1 - 3 revealed that there were no significant differences between male and female technology education students' perceptions on the use, ease of use and usefulness of web-based instruction for learning.

Recommendations
Based on the findings of this study, the following recommendations were made:
1. Technology education students should be encouraged to sustain the use of web-based instruction for learning.
2. The skills that are required to use web-based instruction for learning should be encouraged so as to retain its ease of use for learning among technology education students.
3. Technology education students should be encouraged to continue the use of web-based instruction so as to continue to appreciate its usefulness.
4. Male and female technology education students should be equally encouraged and motivated on the use, ease of use and usefulness of web-based instruction for learning
So as to achieve meaningful and productive learning experiences.

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ENHANCING ADULT LITERACY LEARNERS' PERFORMANCE USING MOBILE PHONE APPLICATION IN NIGERIA

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ABSTRACT

This study examined the effect of mobile phone application on academic performance of Adult literacy learners in Ondo State, Nigeria. Gender difference in the performance of adult learners taught with mobile phone application was examined. The quasi-experiment pretest-posttest experimental control group research design was employed. A sample of sixty (60) adult learners selected using purposive sampling technique participated in the study. The researchers developed the mobile phone application and the test instrument used to collect the data. Validity and reliability was carried out by experts and ANCOVA statistics was used for data analysis. The result of the findings revealed that the adult learners exposed to the use of mobile phone application performed better than those taught without the mobile phone application. Also, findings also revealed that gender had no significant effect on the academic performance using mobile phone application for learning basic literacy and numeracy skills. It was recommended that instructors/facilitators should be encouraged to make use of mobile phone application in teaching/learning process. Also, seminars, workshops and conferences should be organized for both the instructors and adult learners to expose them to the skills and competencies required for using mobile phone application for teaching and learning towards enhancing the delivery of Adult literacy education in Nigeria.

Keywords: Adult basic literacy and numeracy skills, Mobile phone application, Adult literacy learners, Mobile learning, Information and Communication Technology

Introduction

The world have been reduced into a global village with the advent of new technologies and Information and Communication Technology (ICT) has revolutionized the world with the advent of new technologies such as radio, television, digital video disk (DVD), telephone (fixed and mobile), satellite systems, computer network (Allen, 2007). ICT has been defined as forms of technologies used to record, store, process, retrieve and transmit information across the globe (National Open University Nigeria, 2009).

Educational researchers and administrators have recognized that the introduction of ICT into educational institutions whether formal, informal or non-formal could lead to individualized learning in ubiquitous environment. Anthony (2004) believed that ICT will lead to a major change in the culture of learning. The reasons provided were to support this assertion; these include the learning efforts and possibilities linked to ICT. Information Communication and Technology are considered as necessary tools in the classrooms and their importance have been stated in numerous goals of several national curricular.

Onasanya (2009) enumerated some of the uses of ICT in the university system as a guide to lecturers in exploring new frontier in the basic and fundamental researches. Also, Yusuf and Onasanya (2009) opined that, for the teaching and learning more effective, it is essential that ICT gives room for students' participation in the learning process, enhance teamwork, more self-study, self-education oriented teaching and learning.

However, mobile learning or m-learning is one the components of ICT and mobile learning is the learning delivered or supported only or mostly by hand-held and mobile technologies such as Personal Digital Assistants (PAA), Smart Phones or Wireless Laptop PCS (Trasler, 2009).

Mobile learning can be viewed from an educational perspective as technology that supports delivery of instructional contents. Chen, Kao, Sheu and Chiang (2002) enumerated the characteristics of mobile learning as necessity of learning, initiative of knowledge attainment, mobility of learning setting to mention but few. According to Kismohok (2008) mobile learning can develop quality of teaching by providing contact to a range of resources, giving power to students over when and where they study, supporting and cheering collaborative learning and motivating students through the suitable use of interactive course ware. Mobile phone is one of the tools of mobile learning and it has various features that enable it to be used as an educational tool.

Cuing and Wang (2008), carried out a study in universities in United Kingdom using mobile phones to store and retrieved information such as e-books, instructional materials and reviewing students' marks, thus making teaching and learning more effective. Utulu and Alonge (2012) conducted a study in Nigeria on the use of mobile phone and it was revealed that mobile phones were used by students for communication with the lecturers in charge of the course, collecting data, sending e-mails to lecturers, accessing online public access catalogue and share knowledge. Ekamuake and Wishart (2010) opined that mobile phone image capture function allowing teachers and students to bring the outside world into the classroom.

Gender has been identified as one of the factors influencing students' academic performance among the adult literacy learners. Economides and Grousoupovlou (2008) examined the use of the mobile phones by male and female Greek students. It was revealed that females make use of mobile phone to call than males. Also, females take more photographs and record more sounds than male. On the other hand males tend to use more computers and the internet through the mobile phone.

Similarly, MobilEdia news (2005) found that male students used the internet for recreational purposes, information gathering and entertainment while females preferred to use the internet for communication. It is against this background that this study is proposed, in order to (i) Investigate the effect of mobile phone application on academic performance of adult literacy learners, (ii) to explore the influence of gender on the use of mobile phone application for learning basic literacy and numeracy skills and (iii) to find out the interaction effect of gender and academic performance of adult literacy learners

Materials and Methods

Research Hypotheses

The following research hypotheses were formulated and tested in this study:

HO_1: There is no significant difference in the adult learners' academic performance and the use of mobile phone application for learning basic literacy and numeracy skills.

HO_2: There is no significant difference in the adult learners' performance on the use of mobile phone application for learning basic literacy and numeracy skills based on gender.

HO_3: There is no significant interaction effect of treatment and gender on adult learners' academic performance on the use of the mobile phone application for learning basic literacy and numeracy skills.

Research Design

The research design adopted for this study is the pre-test, post-test and control group quasi-experimental design. The experimental group one (1) was exposed to the use of mobile phone application and conventional teaching method while the experimental group two (2) was exposed to mobile phone application only and the control group were exposed to the conventional teaching method.

Population and Sampling Techniques

The population for this study was made up of all adult literacy learners in different study centre in Ondo State, Nigeria, while the target population comprised all adult learners in three study centres from three Local Government Areas (LGAs) in Ondo State. The sample for this study was made up of sixty (60) adult literacy learners. Purposive sampling was used to select the adult study centres based on the following premises: (i) There are registered adult learners ready for active learning, (ii) The study centre selected used the same adult basic literacy and numeracy curriculum (iii) The facilitators were available and ready to work with the researcher in this study. Forty (40) adult learners were in experimental groups while twenty (20) were in control group and this formed the three groups selected for the study by the researcher. At the experimental group twenty one (21) were males while nineteen (19) were females, also in the control group, six (6) were males while fourteen (14) were females and they were randomly selected for the study.

Research Instruments

The two instruments used in this study are Treatment and Test Instruments.

a. Treatment Instrument: Mobile phone application that consisted of alphabets and numeracy which were sub-divided into five (5) lessons namely: Alphabets, vowels, consonants, vowels and consonants and numerals. The language of the adult learners which is Yoruba Language was used for the teaching.

b. Test Instrument: This was used to collect data for this study was researcher adopted Adult Basic Literacy and Numeracy Academic Performance Test, consisting of twenty-five (25) multiple choice objective items. The test instrument was validated to ensure face and content validity, it was given to five adult instructors, four Yoruba teachers, four educational technology experts from University of Ilorin, Ilorin, Kwara State, Nigeria and the mobile phone application was given to four computer programme experts, four Yoruba teachers and four educational technology experts from University of Ilorin, Ilorin, Kwara-State. The mobile phone application was trial tested on twenty (20) adult learners at Ilorin study centre at Geri Alimi, at Ilorin. The reliability for the two instruments was determined using Cronbach's Alpha correlation coefficient with the value 0.90 and 0.80. Therefore the research instruments were considered to have adequate internal consistency or reliability needed for the study.

Procedures for Data Collection

The data for testing the hypotheses was collected from the pre-test and post-test administered to the adult learners in the study. Nineteen weeks was used for the teaching, the treatment and marking and scoring of the scores.

Results

The data collected for this study were analysed using Analysis of covariance ANCOVA.

Hypothesis I: There is no significant difference in the adult learners' academic performance and the use of mobile phone application for learning basic literacy and numeracy skills.

Table I: Adult learners' performance in basic literacy and numeracy skills.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9400.031[a]	4	2350.008	74.440	.000	.844
Intercept	3562.169	1	3562.169	112.837	.000	.672
Pretest	141.478	1	141.478	4.482	.039	.075
Treatment	7453.431	1	7453.431	236.099	.000*	.811
Gender	5.212	1	5.212	.165	.686	.003
treat * gender	846.652	1	846.652	26.819	.000*	.328
Error	1736.302	55	31.569			
Total	279138.000	60				
Corrected Total	11136.333	59				

R Squared = .844 (Adjusted R Squared = .833)

Table I reveals that there is no significant difference in the adult learners' performance in basic literacy and numeracy skills $(F_{(1,55)} = 236.099; p < 0.05; \eta^2 = .811)$. Hence, hypothesis is not accepted.

Hypothesis 2: There is no significant difference in the adult learners' performance on the use of the mobile phone application for learning basic literacy and numeracy skills based on gender.

Table II revealed that gender had no significant effect on adult learners' performance in basic literacy and numeracy skills $(F_{(1,55)} = .165; p > 0.05; \eta^2 = .003)$. This result implies that the mean score of the male and the female adult learners on basic literacy and numeracy skills were not significantly different. Hence, hypothesis II is accepted.

Hypothesis 3: There is no significant interaction effect of treatment and gender on adult learners' academic performance on the use of the mobile phone application for learning basic literacy and numeracy skills.

From table I, it is shown that there is a significant interaction effect of treatment and gender on adult learners' performance in basic literacy and numeracy skills $(F_{(1,55)} = 26.819; p < 0.05; \eta^2 = .328)$. This means that both treatment and gender jointly had significant effect on the adult learners' performance in basic literacy and numeracy skills. Hence, hypothesis 3 is not accepted.

Discussion of findings

The results of the analysis of the ANCOVA on the performance of adult learners taught basic literacy and numeracy skills and those exposed to conventional teaching methods revealed that a significant difference in favour of the adult learners in the experimental groups 1 and 2. The results reveal that adult learners taught with mobile phone application performed better than those exposed to conventional teaching methods. These results are in agreement with the studies of Utulu and Alonge (2012), Ekamuake and Wishart (2010) and Cuing and Wang (2008) which focus on the use of mobile phone for learning in schools. They however contradict the conclusion of Warschaver (2011) who found no significant difference between the control group and experimental group on the use of Ipads in a K-12 school in United State.

Also gender had no significant effects on the use of mobile phone application by adult learners for learning basic literacy and numeracy skills in their study centres. The study negates the findings of Economides and Grousoupoulov (2008), which were of the opinion that the male students used mobile phone more than the male counterparts. It corroborates the findings of MobilEdia news (2005) that gender has influence on the use of mobile phone in teaching/learning process. Hence, gender as a variable has an impact on academic performance of adult learners.

Conclusion and recommendations

The study has provided empirical findings to support the effectiveness of mobile phone application for learning basic literacy and numeracy skills. Based on the findings of this study, the following recommendations were made:

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THE PLACE OF INSTRUCTIONAL MEDIA IN THE TEACHING AND LEARNING OF CHILDREN WITH READING DISABILITIES IN PRIMARY SCHOOLS IN NIGERIA

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Abstract
This paper focuses on the use of instructional materials, in the teaching and learning of children reading with disabilities in the primary schools. The purpose was to bring to bear, the policy implementation for the teaching and learning of children with reading disabilities and the use of instructional materials to bridge the gap between disabilities and instruction. For effective data collection, reading disabilities identification and utilization questionnaire were the instruments developed and used to identify children with reading disabilities. This paper highlight four causes of reading disabilities and various instructional materials to improve as well as proffer solution to reading problems in primary school in Nigeria. It was recommended that teachers, learners, Government, parents educators, curriculum developers/planners and the society should collaborate to procure and provide adequate and appropriate instructional materials to school for effective teaching – learning of children with reading disabilities in Nigerian primary schools.

Introduction

Education is the hallmark of human development and language. It is on of the indices of the development of any nation. Solid foundation is required at the early stage of education. Primary/early education involves training the beginners to attain greater heights in life/. Training the child is the best sustaining the systems, values, society and to maintain its norms, belief systems, values, virtues hopes and aspirations. These may not be archive where there be disorder of listening, thinking, talking, reading, writing, spelling or calculating disabilities in a child or children. Lere M.M(2009).

The mode of training the child is difficult and complex because children come from diverse homes and environment; they have perception, and varying learning capabilities. It is here seen that a systematic approach to instruction is a necessary for schools if every child is to be effectively and efficiently trained. It becomes imperative that a well designed media and instruction is necessary to take care of the teaching and learning. Therefore, visual, audio; and audio visual media required with a systematically designed instruction to engage the teachers and learners actively. The active participation of teachers and pupils can only be achieved when the school curriculum is fully integrated with instructional and modern instructional media application at every stage of the school process. (Gbama 1984 and Harris Lawin, and Brescott (1975) advocated for the professional development of teachers for curriculum development and creating of learning materials.

In the same vain (Ekpo; 1996 Imogie; 1988, Ibe-Bassey; 1992 and Asuquo; 1998) among others feel that the most appropriate technology is to develop resourcefulness in the teachers and their teaching to enhance learning. This relates specially to the media design development and improvement o teachers' capacity for the application of technical skills in producing instructional media.

Effective teaching/learning require appropriate and well designed produced and utilized media. This will go a long way to improve reading disabilities in children.

Heinich, Molend, and Russel (1982), started that "children highly structured learning situations because they lack the necessary field of experience and that emphasis should be placed on visual and audio materials for instruction. Therefore, instructional resources should be adequately and appropriately used in teaching and learning situations to solve learning disabilities, especially reading problems in Primary schools which is the foundation for all levels of education. Any problem at the early stage of learning, if not identified, corrected and solved, would affect other levels of education.

This requirement necessitated the present study on the place of instructional materials in the teaching and learning of children with reading disabilities in primary schools.

The Special Needs Child.

The term "special needs child" according to Ozoji (2005), is a term that used to describe clients of special needs education.

Special Needs used in this paper are classified into three:

i. Those that are currently enrolled into primary school but for various reasons do not make progress adequately.

ii. Those not currently enrolled into primary school but who could be enrolled if the school were more respective and,

iii. The relatively smaller number of children with more severe physical mental or multiple impairments who have complex special education needs that are not being met (UNESCO; 1994 IN Ozoji: 2005).

Special needs children are those who have special learning needs either because of sensory deficit or high intellectual ability that is not properly addressed in the regular school programmes. Such a child require special programme more in the regular school than in the special school in order to develop to his/her maximum capacity. A special need is child also called an exceptional child.

Exceptional children are:

i.   Learning disabled children
ii.   Visual impaired children
iii. Gifted children
iv.   Attention deficit
v.   The emotional disturbed among others.

Disability refers to loss of function or activity. It is not impairment which has to do with organ or organs dysfunction or deficiency. Children with disabilities are able to perform certain tasks but may not be able to perform few tasks but for special learning needs like instructional materials. These include Basic Textbooks, Workbooks, pictures, radio, television, computer, audio-tapes, Slides, Multimedia, Flashcards, Models, Charts, Flannel boards, Drawings among others.

Children with Reading Disabilities are identified with the following conditions:

1. Has difficulty in expressing ideas and wants

2. Cannot read any visual materials nor interpret audio materials

3. Has difficulty in reading

4. Cannot pronounce words correctly

5. Cannot comprehend what he/she reads

6. Cannot comprehend spoken English

7. Has problems with certain classes of word e.g. verbs, tense and discriminated word and letters.

8. Has [problems in spelling and or spelled word while reading

9. Have problem with complex words and sentences

10. Rote learning and reciting from textbooks without understanding.

Causes of Reading Disabilities in School Children
Reading disabilities in school children are caused by many factors including:
a. Poor home background
b. Untrained and inexperienced teachers/non professionals
c. Lack of instructional/reading materials
d. Inadequate and inappropriate materials
e. Inadequate preparation of instruction by both the teachers and learners.
f. Poor or inappropriate method of teaching
g. Lack of interest by both the teachers and learners
h. Lack of motivation, incentive and reward
I. Lack of inspection to schools.

The Concept of Instructional Media/Material in Teaching
Learning Media in education refers to resources used to meet an educational need. "Resources' according to Hanson (1975), has been broadly seen as an anything used to meet an educational need. These include; building, staff, equipment, ideas and materials. He sees the entire world as a resource centre. But this nation calls for well selection, well designed and produced resources if educational needs must be met.
 Therefore, a good management technique in handling, storing and retrieving such materials is advocated by educators, media designers, producers for effective utilization. For purpose of instruction such resources should meet the learners' characteristics and instructional objectives.

Instructional material store and distribute the experiences of the instructor for the learners to learn. They can be referred to as any device used by the teacher to expose the learners to appropriate and relevant experiences. They carry concepts and ideas for the purpose of facilitating learning and possible change in bahaviour.
They may be print, non print or interactive type of instructional materials. They include such materials as may appeal to the senses for learning within a given environment.

Classification of Media Materials
Our environment is filled with instructional material or media which can be categorized into visuals, audio and audiovisual types of materials. In general term, instructional materials/media are classified in the context of use and mode for effective utilization. Visual material can either be projected or non-projected. Individuals can learn through their visual and aural senses or a combination of visual and aural senses. Projected visuals include: Sliders, filmstrips, overhead transparencies and opaque projection. While non-projected, visuals includes: still (flat) pictures, charts, posters, cartoons models, real objects and life specimens. Visual materials are usually displayed in the following format:
Chalkboards, multipurpose boards, bulletin boards, cloth boards, magnetic boards and pocket charts. There are self-instructional and interactive instructional media or materials which include computer-assisted instruction and programmed learning materials .
Audio instruct mental materials or media illustrates audio stimuli and these may include: games consoles digital music players, television, audio tape/cassettes, phonograph records, audio cards and many others.
Agun (1988), based his classification on the print or non – print materials perspective, while Akanbi (1988), classified instructional whether they are locally or commercially produced. This indicates how inexpensive or expensive such materials could be. Ibe-Bassey (1992) and Asuquo (1998), classified instructional material/media into three basic group according to the learners sensory modalities of :

1. Visual;
2. Audio; and
3. Audiovisual

EKPO (1996 classified instructional materials/ media into four major group us ing various modes as the criteria thus:

Print
By formal ――― Non Print ――― Software / Hardware

By Sensory Mode ――― Audio / Visual / Audio-Visual

By Presentation Mode ――― Project / Non-Project

By coverage/Class ――― Individualized / Small group / Large group

Asuquo, E. N.

The Place of Instructional Media Iin the Teaching And Learning of Children with Reading Disabilities in Primary Schools in Nigeria
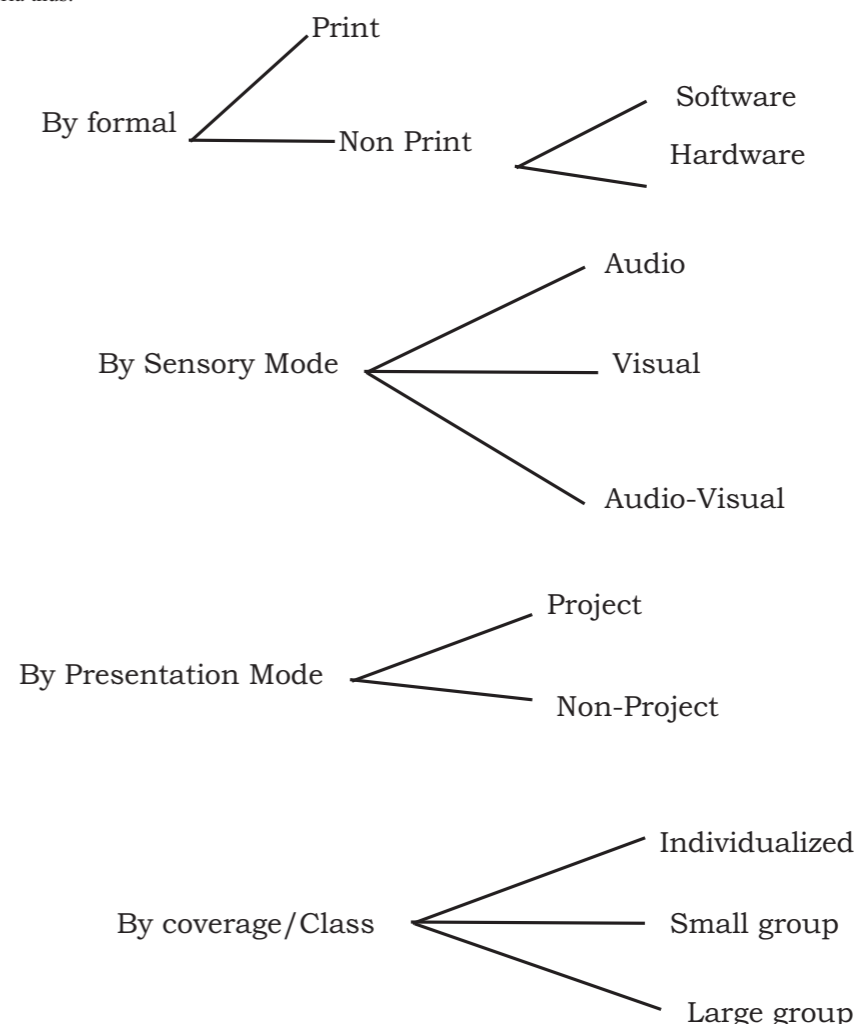
Instructional Values of Media/Materials

It is noted that instructional media have their general functions which are to enhance effective of teaching and leering, concretizing ideas and engendering creativity (Onasanya; 1991) and Asuquo (1998). The committee of the National Society for the study of Education (1949) reviewed the accumulated benefits of instructional media when properly used as follows:

a. They supply a concrete basic for conceptual thinking's.

b. They have a high degree of interest for learners.

c. They make learning morepermanent

d. Stimulate self activity

e. Develop a continuity of thoughts, and,

f. Contributes to the growth of meaning.

Apart from identified aforementioned facts, instructional media will bring about expected improvement in learning. They serve as powerful motivating factors. Some necessary media must be obtained, used if the learning objectives are to be achieved. There are some optional uses of media or instructional materials which do enrich activities if they can be obtained. Such are optional.

In another categorization, some media, like maps, models and pictures, are used by learners to practice a skill if they are to achieve mastery. Such are described as criterion media. Other like, mediating media help pupils to gian an insight into an event in other to acquire the required skill; therefore, instructional materials/media have many functions in teaching-learning. But such instructional material/media required systematic design production and utilization.

The Teaching and Learning of Reading in Primary Schools

The teaching and learning of Reading is the, hallmark to bridge the gap between oral and written aspect of English Language. The spoken and reading aspects of English Language are interwoven and very unique in the Nigerian Education system and the world at large. Therefore, the use of appropriate and adequate instructional material needs to be acquired and to express it by both the teachers and leaners. The awareness and importance of reading is emphasized in the task of teaching and learning of English Language on a daily basis be it a first, second or third language. The formal education of this subject is indicated in the recommendation of the National Curriculum Conferences (1969) that: English should be the medium of instruction from 3rd year of elementary or primary school up till the university level except in other languages.

In line with the above recommendation, Oke (1970), observed that English language is taught in schools in three levels to expose and strengthen the learners to the content, participation and addressing the wider world. He outlines the following levels; primary, secondary senior levels of formal teaching and learning of English in Nigeria. At the primary level which is the focus of this paper, emphasis is on simple conversation, simple reading and simple writing as a result of switch from the mother tongue. The foundation of teaching-learning lies here but such foundations are often inadequate because skills. Most of the teachers do not acquire the skill, adequate background and qualification to impact the specialized knowledge to the learners. Many primary schools in Nigeria are seen with assigned teachers to each class to teach all the subjects in the curriculum. This affects professionalism, poor academic achievement hence reading disability.

In the same vein, Adelusi (1984), asserted that the primary aim is to teach basic skills of listening, speaking, reading and writing. Here, there are problems f lack of qualified staff and adequate/relevant teaching materials. He remarked that, there is a complex problem in the content, context and teaching- learning of English in Nigerian schools. Poor speech performance of learners in schools are due to poor reading and poor handling by teachers inadequate practical and training as the crucial factors in the teaching-learning of speech-Reading by the children is lacking.

This situation could be blamed on the curriculum designers /developers, parents and the society at large. The problem could be solved when educational problems are identified and appropriate measures applied to the teaching-learning situations. Thus, reading as performance o speech in a life wire of both teachers and the learners, and as a medium of conveying instruction and getting responses and feedback, this requires mastery though the use of adequate and appropriate instructional materials.

Irrespective of children disability in reading, the use of instructional materials in teaching-learning can bridge the gap and offer proper solutions to reading disabilities in children. Ajayi Dopemu (1984), claimed that "hearing, seeing, touching and listening are gateways of human learning". He emphasized that; appropriate instructional materials should be utilized by learners for effective and active involvement intellectually. Medahusi (1982), made mention that what we see and hear influence our behavior, hence teaching should stimulate what we ought to see and hear so as to ensure learning. They see these as the major factors in effective teaching-learning situation, and recommended the use of instructional materials for effective teaching-learning situation.

Asuquo (1998), and Akinpelu (1975), recommended the use of audio-visual for teaching and learning of English Language. There are abundant research evidence to support the use of instructional materials such as radio, television, pictures among other for the teaching-learning in schools Kemp, 1980; Romziowkski, (1988; Imogie, 1980; Ajayi-Dopemu, 1988; and Asuquo 1998). Heward and Orlansky (1980), expressed that most public schools had established special education programmes for handicapped. The children seemed physically intact, yet there were unable to learn basic skills like (reading) and other subject at school because public schools had no special programme is for these groups of learners.

The poor performance of his group of children in reading is of great concern, hence this paper on the media materials for the teaching and learning of children with reading disabilities in primary schools.

According to Anwe (1991), various National policies on education stipulate that equal educational opportunities as fundamental right of all Nigerians. This situation is not catered for due to lack of implementation effort by the three tiers of government i.e Federal, State and Local Government. Due to these lapses there is urgent need to bridge the gap between disabilities and instruction through the provision and use of instrumental materials such as radio, television, pictures among others.

It is obvious that children with learning disabilities study along with others without disabilities and they are normal in appearance with no deformity, injury, disease, body damage or defect. The National Advisory Committee on handicapped children of the U.S Office of Education (1975), regarded such children as having a disorder in one r more of the basic psychological processes involved in understanding or in using language, spoken or written, which manifest itself in an imperfect ability to listen, think, speak, spell, read, write or do mathematical calculations. They have other children who have learning problems which are primary as a result of mental retardation, visual, hearing or motor handicaps or environment, cultural or economic disadvantage (94-142).

Suran and Rizzo (1979) suggested that approximately five (5) percent of school-age children in the United State have speech problems, severe enough to affect their education. This percentage represents a very large population compared to other categories of children who are considered handicapped; the 5 percent criterions who are considered handicapped, the 5 percent criterion would mean that between 2 to 3 million American children have speech problems. This statement agrees with the American speech and Hearing Association which reported in 1961, the following types and percentage of disorders:

Language disorders – 3 - 5%

Fluency disorders – 7%

Voice disorders – 2%

Articulation disorders 80%

Other disorders – 5 – 6%

In Nigeria, this problem is more prevalent in public primary schools than in private. However, differences in speech, pronunciation and reading due to cultural background, ethnic affinity or dialects of a standard language should not be considered defective because they are reflective of the linguistic community. For instance, the three major languages: Igbo, Yoruba and Hausa could be viewed differently in this aspect because of their cultural and ethnic backgrounds, however, it must be noted that any foreign language or second language such as the English language used in Nigeria requires appropriate usage for correct and proper understanding for effective teaching and learning.

This task is required of the teacher as model to the learners. The children will follow the teachers' speech and reading pattern. They also imitate the teachers through reading/oral composition, conversation, dramatization among other. Teachers are therefore, encouraged to motivate the children to acquire correct reading habits which are the foundation for listening, writing, speech and vocabularies building. Hence, understanding and proper self expression.

Conclusion

This paper identifies reading problems and media materials for the teachings-learning of children with reading disabilities in primary schools. To meet uniqueness of every child, highly structured learning situations that include visuals, audio, audiovisual materials for effectives teaching and learning is advocated: - There is urgent need for adequate and appropriate instructional materials/resources, manpower and funding. This requirement when met, improve and correct reading disabilities at the primary level of education.

Recommendations

Effort of the teachers, parents, educators, curriculum developers/planners, media designers, media designers and developers and the three tiers of Government is required to collaborate, procure and provide appropriate and adequate instructional material to schools to enhance the teaching-learning of children with reading disabilities in Nigeria.

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EFFECTS OF PROBLEM SOLVING METHOD WITH POWER POINT ON ACHIEVEMENT OF SECONDARY SCHOOL PHYSICS STUDENTS IN REFRACTION OF LIGHT WAVES

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Abstract

This study was designed to determine the effect of problem solving method with PowerPoint on SS II physics students' academic achievement in refraction of light waves in Ilorin Kwara State. Two Research questions were raised and two Null hypotheses were tested. The study adopted a pre-test and posttest control and experimental group design. The representatives sample size for the study comprises of one hundred and twelve (112) Physics students selected using purposive sampling techniques from three (3) senior secondary schools in Ilorin, Kwara State. The Researcher taught the experimental group Refraction of light waves using problem solving method with power point, while the control group was exposed to problem solving method using traditional approach. The instrument for data collection was 50-items multiple-choice tagged Achievement Test on Refraction of Light Waves (ATRLW) reflecting the content in the lesson note. A reliability coefficient of 0.785 was obtained using Pearson's moment correlation coefficient(r). The data was analyzed statistically using independent sample t-test and the statistical results accepted the null hypothesis of the study. The study revealed that using problem solving method with power point and problem solving method with traditional approach both enhances SS II physics student academic achievement in refraction of light waves, also there was no discrimination of the academic achievement of male and female students when taught with problem solving method using power point. The use of problem solving method with power point has an essential effect on male and female students. The study also revealed that problem solving method generally enhances students' ability in solving problem in physics. It was concluded that problem solving-ability in students is a critical variable of students' academic achievement in refraction of light waves.
Key word: Problem solving, Power Point, Physics , refraction of light waves

Introduction

Physics is the center point to all science subjects based on its contribution to the development of science and technology that has improved the quality of life and human activities. The place of physics in science Education, applied sciences, Engineering and Technology makes it highly important and imperative for science students to take the subject seriously. Alukwo, Okereke and Ezekannagba (2000) defined physics as the mother of all science that deals with the composition and changes of matter. To be able to appreciate, control and effectively benefit and utilize our natural resources, it is important and imperative to acquire basic scientific knowledge as a basic tool for all forms of industrial and technological advancement of any nation. (American physical society 2014).

Nigeria and many nations of the world have recognized the importance of science and technology especially physics in its developmental endeavors (Bamigbala, 2006). This is because physics is the basic indexes in understanding the difficulties of modernize technologies (Ates & Eryilmaz, 2011). Students' academic achievement in physics WAEC and NECO standardize examination has consistently been on a decline. In WASSCE chief examiners report for May/June result 2009, reported that candidate's population of 465,636 in physics recorded a standard deviation of 9.0 and an average score of 26 as against a standard deviation of 9.43. This may make students at secondary school level demonstrate negative attitude towards physics as the toughest of the three conceptual sciences (Omole, 2008 & Cakirolgun, 2008). This also attract the attention of researchers, parents, guardians, the public and the Government to proffer solutions.

The nature of physics demands that appropriate and dynamic methods needed to be applied in teaching physics in order to eliminate fear and perception of the difficult nature of physics among students' to enhance students' understanding and achievements in physics through problem solving method. Physics is perceived to be a difficult course or subject because of its abstract nature (Cheong, 2008). Physics is an intellectually demanding subject that requires good mathematical skills or sound mathematical foundation and strong practical knowledge for thorough understanding. Physics as a central science subject exposes students' to knowledge ranging from mechanics, electricity, waves, radioactivity with emphasis on learning scientific laws, concept formation and practical physics.

Kanno (2000) and Ajagun (2001) cited that the performance of students' in science subjects especially physics has not been encouraging. Physics is an intellectually demanding and challenging subject. Physics required great or adequate mathematical skills for good understanding, it also requires strong practical foundation and knowledge in order to achieve success "merit or credit" in a standardize examination like WAEC and NECO.

Researchers have described the relative effectiveness of different teaching methods in helping students understand physics concepts, such as in mechanics, electricity, radioactivity, waves, optics and light to mention but few. This may encourage removing the complexities and difficulties of understanding physics concepts among students through the identification and development of teaching strategies which will enhance physics students' academic achievement in physics.

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Problem solving method of teaching is also popularly known by educational scholars as problem based Instruction. The definition of problem based learning varies widely due to differences in practice and has appeared in various studies or review papers such as Gijbels et al (2005) and Prince (2004). Problem solving is comparative or identified with such terms like basic speculation innovative thing, thinking and choice making in light of the fact that they are all on a very basic level a psychological action, innovative considering, thinking and choice making are all subsets of critical thinking went for accomplishing a particular target or objective. In problem solving method, students are trained, using learning situations, to solve problems. The history of this method of teaching can be traced to John Dewey.

Types of Problem Solving Method

i. The directed approach
ii. The modified approach
iii. The unrestricted approach

The directed approach problem based method of learning is used by the teacher when the students are in experienced in the use of the method. The teacher takes control and directs the students' in all areas of the lesson. He initiates the topic the hypothesis, the collection and analysis of the data. He also guides the student to arrive at a generalization that is solution to the given problem. The modified approach problem based learning is used by the teacher when the students are "catching up" the method. They can handle some parts of the procedure. However, the teacher still serves, as a resources person while The unrestricted approach problem based learning is used by the teachers when the students' can handle the method on their own, they can formulate the topic and work on it on the making of the generalization that is providing solution to problem.

Procedures in Problem Solving Method

There are procedures that can be used in problem solving method of teaching

i. The inductive procedure
ii. The deductive procedure

The inductive procedure enables students to provide solution to problem or establish generalization and from observed cases. The inductive procedure considers the following;

i. the study of the topic
ii. finding out facts about the topic
iii. detailing speculation
iv. collecting and analyzing information
v. testing the theory against the after effect of the information investigation
vi. drawing of conclusion
vii. application of the conclusion to new situations and refined information
viii. meaningful speculations are then drawn

The deductive procedure, students are given laws to enable them solve a problem or to prove the correctness of the laws. Deductive procedure considers the following;

i. the generalization is given
ii. the generalization is applied in new situations and against new data
iii. a conclusion is drawn

Statement of the Problem

The academic achievement of secondary school students' in physics examinations conducted by West African Examination Council (WAEC) and National Examination Council (NECO) has consistently been discouraging. This has attracted increased attention of researchers, the government, general public and parents. Some have concluded that there is a fall in the standard of education in Nigeria. Purpose behind the dreary scholarly accomplishment of students' in material science (physics) incorporates the following: Inadequately qualified physics educators, inadequate motivation for understudies, Students' poor mathematical foundation, Poor procedure of teaching physics.

The teaching of physics at secondary school level has been characterized with such approach as convectional lecture method, guided inquiry method and discussion method hap-hazard delivered and done within 35 minutes or 40 minutes relying on textbooks and rote memorization. One general problematic topic identified from the failure experienced by students' in the aforementioned examination is Optics and light waves. Optics and light waves is one broad area from Senior Secondary School Physics Syllabus in SSII class that is problematic for most students to answer in WAEC and NECO Examination from Chief examiners marking result yearly. These in all has resulted to poor achievement in physics standardize examination in secondary schools. In order to address and overcome the aforementioned problems of poor academic achievement in physics standardize examination conducted by WAEC and NECO from students'. The researcher initiated this study; effect of problem solving method with power point and animation on physics students' achievement in refraction of light in Ilorin, Kwara State.

Purpose of the Study

The research was designed specifically to:

i. determine the effect of problem solving method with use of power point on SS II Physics students' academic achievement in refraction of light waves.
ii. determine the effect of problem solving method with use of power point on male and female SSII Physics students' academic achievement in refraction of light waves.

Research Questions

The following research questions were raised to guide this study:

i. what is the significant difference on SS II students' academic achievement using problem solving method with power point in refraction of light when compared with traditional approach of problem solving method?
ii. What is the significant difference between male and female SS II physics students' academic achievement in refraction of light using power point?

Hypotheses

The following hypotheses were tasted in this study:

$H0_1$: there is no significant contrast on SS II students' academic achievement using problem solving method with power point in refraction of light when compared with traditional approach of problem solving method.

$H0_2$: there is no significant contrast between SS II male and female students' academic achievement in refraction of light using power point.

Methodology

The study adopted quasi-experimental design in which pretest-posttest non-equivalent, non- randomized control group design. This was considered most suitable for the study because it establishes a cause and effective relationship between the independent and dependent variable of the study ((Fraenkel & Wallen, 2003). Intact classes were used for this research based on the fact that it will not be possible to have a complete randomization of samples for the study without altering or disturbing the school curricular activities, non-curricular activities and other routine activities. The target population for this study was SSII physics students in Ilorin metropolis. Purposive sampling techniques were used for the selection of the three (3) schools for the study in Ilorin, Kwara State. The schools selected have ICT centers called school net which is suitable for carrying out the study for the experimental group. The sample size for the study comprises of one hundred and twelve (112) Physics students selected using purposive sampling techniques out of four hundred and twenty-five (425) Physics students in senior secondary two (S.S.II) were used for this study. Thus a total of Fifty-seven (57) male students and Fifty- five (55) female students were involved in the study.

The instrument for this study is Achievement Test on Refraction of Light Waves (ATRLW) which consisted of Fifty (50) multiple choice objective questions adopted from past questions of West African examination council (WAEC), Joint admission Matriculation Board (JAMB), from and National examination council (NECO) from year 2010 to 2016. The instrument has been validated by Physics experts and the test and measurement department of these aforementioned Examination Bodies. The Achievement Test on Refraction of Light Waves (ATRLW) were administered to thirty (30) physics students which were randomly drawn from senior secondary two (SSII) class comprising eighteen (18) males and twelve (12) females. The instrument was administered at an interval of two weeks in order to obtain two sets of score, A reliability coefficient of 0.785 was obtained using Pearson's moment correlation coefficient(r). A Pre-test item comprising of fifty (50) multiple choice objective questions on refraction of light was administered for sixty (60) minutes to both the control and the experimental group under the supervision of the Researcher and the physics teachers of the respective schools in order to determine the student's prior knowledge on Refraction of light before the treatment was introduced to experimental group and classroom teaching to control group. The answered scripts were collected from both groups. After the treatment and classroom teaching in three weeks a Post-test was administered comprising of the same fifty (50) questions randomly re-arranged to determine their new knowledge on Refraction of light. The answered scripts were collected from both the control and experimental group respectively; the scores from the test were recorded and processed statistically. The data were statistically analyzed using parametric inferential statistics Analysis of variance (ANOVA) was used to answer hypotheses.

Microsoft power point is a software application package use for presentation. The presentation of this research work is centered on problem solving method approach in teaching refraction of light in Physics and Microsoft power point is a helpful application to help this Method. The steps in designing this lesson are itemized as follows;

i. the slide for the presentation were made using the new slide icon from the home menu
ii. the text box from insert menu box made it possible for the typing of letters and numbers
iii. equation editor from Microsoft word made it possible to embed the formula for the refractive record of light.
iv. the shapes: Rectangle, Triangle, arrow and lines were all gotten from the insert menu using the auto shapes
v. colouring of the arrow and lines were done using the formatting bar for both the lines and arrow.
vi. animation effect on arrow showing movement from dense to a less dense medium is done using the custom animation

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Data Analysis

The pretest was carried out for the experimental and control group to find the correspondence i.e. entry level of the two group previous to the experiment happening. The pretest result of the control and experimental group is presented in table 1 below.

Table 1:
Pretest Table of Result

Variables	Samples size	Df	Mean	S.D	t-value	P-value	Remark
Experimental Group	62		3.97	1.93			
		112			0.779	0.438	No significance
Control Group	50		3.68	1.85			

From Table 1 above the t-value of 0.779 was found to be at 0.05 level of significance since p>0.05, it means that there is no significant differences in the pretest mean achievement of the control and experimental group. This entails that the group are comparatively equivalent in terms of entry level or mode academically for the study. It implies that no group has comparative advantage over the other academically for this investigation.
Hypothesis 1
Ho$_1$ there is no significant contrast on SS II student's academic achievement using problem solving method with power point in refraction of light waves when compared with traditional approach of problem solving method.

To test this speculation, the posttest academic mean accomplishments of the test control gathering were figured measurably utilizing independent sample t-test. Tables 2. presents the results below.

Table 2:
Post-test Table of Result

Variables	No. of samples(N)	Df	Mean(X)	S.D	t-value	P-value	Remark
Experimental Group	62		32.893	5.17			
		112			0.001	0.999	No significance
Control Group	50		32.891	4.63			

From Table 2 above the t-value of 0.001 was found to be at 0.05 level of significance. Since p>0.05, it indicates that there is no huge differences between the average achievement of the experimental group (32.893) and the mean achievement of the control group (32.891). Therefore, hypothesis 1 (Ho$_1$) is accepted.
Hypothesis 2
Ho$_2$ There is no huge differences between the average academic achievement of the male and female students in refraction of light waves using power point.
To test this hypothesis, the posttest academic average achievement of the experimental group was computed statistically using independent sample t-test.

Tables 3:

Variables	No. of samples(N)	Df	Mean(X)	S.D	t-value	P-value	Remark
Male	35		33.80	5.30			
		62			1.431	0.157	No significance
Female	27		32.10	4.99			

From Table 3 above the t-value of 1.431 was found to be significant at 0.05 level. Since p>0.05, it indicates that there are no noteworthy contrasts between the mean academic achievement of male students' (33.80) and female students' (32.10). Therefore, hypothesis 2 (Ho$_2$) is accepted.

Discussion of Results

The aim of the study was to investigate the effect of problem solving method with Power Point on SS II physics students' achievement in refraction of light waves. With a specific end goal to do this examination work two (2) exploration inquiries were defined and tried.

Research Question One: Is there any significant difference on SS II physics students' academic achievement using problem solving method with power point and animation in refraction of light waves when compared with traditional approach of problem solving method? From Table 1, comparing the experimental group average achievement and control group average achievement. The average achievement of the experimental group was found to be (32.893) while that of the control group was found to be (32.891). This result established or revealed there was no huge contrast in the average achievement of student taught refraction of light waves using problem solving method with PowerPoint and animation and student taught refraction of light waves using problem solving method with traditional approach.

From the above findings, it can be deduced that student taught refraction of light waves using problem solving method with PowerPoint did not perform better than student taught refraction of light waves using problem solving method with traditional approach. The mean achievement for the experimental group and the control group were respectively 32.89 and 32.89 significantly above average achievement in scholastic standing out of a maximum score achievement of 50 marks from the test instrument. Thus it therefore means that the using of problem solving method have enhancing positive effect on teaching refraction of light waves using Power Point and using the traditional approach. The result from the study is in agreement with the findings of (Akinoglu and Tandogun, 2007) who stated that the implementation of problem based active learning model had positively affected student academic achievement towards science course. This result is in contrast with the result of Sahin (2007) which revealed that students' expectation deteriorated rather than improving in material science (physics) and material science (physics) learning in problem based learning class as an aftereffect of one semester of guideline.

Research Question Two: Is there any significant difference between male and female SS II student's academic achievement in refraction of light waves using Power Point? From table 3, there is no huge contrast in the mean achievement of male and female students' taught refraction of light waves using PowerPoint and animation. The mean achievement of male students' is 33.80 while that of female students' is 32.10 significantly above average achievement in scholastic standing out of a maximum score achievement of 50 marks from the test instrument. Thus it therefore means that the use of problem solving method with power point and animation has an enhancing positive effect on both male and female students' in the experimental group hence there was no discrimination in term of gender for achievement in the scholastic standing out of a maximum score achievement of 50 marks from test instrument.

Summary

The findings made from the study are summarized as follows:
i.The findings revealed that the use of problem solving method with PowerPoint in teaching and learning of refraction of light waves is effective as indicated by majority of the respondents in the experimental group.
ii.The findings also revealed that the use of problem solving method with traditional approach is effective as indicated by majority of the respondents that serve as the control group.
iii.The findings also revealed that there was no gender discrimination in terms of academic achievement in the use of problem solving method with power point in teaching refraction of light waves

iv. The findings also revealed that problem solving method generally enhances problem solving ability in physics and also improves the mathematical solving ability among students' in the experimental and control group.

v. The findings revealed that the major problem associated with the use of problem solving method with PowerPoint include inadequate or instability of electricity supply, limited number of computers, projector, poor mathematical skills, most of the students are not computer literate and lack of adequate skill in the use of Microsoft power point system application.

Conclusion

The study revealed or established the effectiveness of using problem solving method with power point and the traditional approach of problem solving method of teaching refraction of light wave as indicated by the outcome of the test instrument used in the study for both groups. In other words, problem solving method with traditional approach and with power point facilitates student's achievement in refraction of light waves.

The study also revealed or established that there was no discrimination in term of gender for the student's academic achievement in refraction of light wave from the power point and animation. Thus it can be concluded that achievement is a function of cognitive ability and not gender. Gender was found not to be a significant factor that determines achievement of refraction of light waves. Therefore, it is concluded that problem solving method of teaching generally improves students' problem solving ability in refraction of light waves in physics that is it makes physics students' good problem solvers.

Recommendations

Based on the findings outlined above, the following recommendation were made by the researcher

i. Problem solving method generally should be utilized in teaching areas in physics that involves a lot of calculations.

ii. Problem solving method should be applied by Physics teacher during corrective evaluation of students'

iii. Problem solving enhances students question and answering skills.

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PERCEPTION OF UNDERGRADUATE STUDENTS ON THE UTILIZATION OF FLIPPED CLASSROOM FOR LEARNING IN KWARA-STATE

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Abstract

This study investigated the perception of undergraduate's students on the utilization of flipped classroom for learning. It also investigates the influence of gender on undergraduates' utilization of flipped classroom for learning. The study employed a descriptive research of the cross-sectional survey type. Two hundred and fifty eight (135 males, and 123 females) undergraduates students were randomly selected from the three selected Universities in kwara State. Researcher-designed questionnaire was used to elicit information from the respondents with reliability coefficient of 0.91 using crombach alpha formula. The questionnaire was analysed using simple percentage and mean. Independent t-test and Analyses of variance (ANOVA) were used to test the hypotheses with the aid of statistical package for social science version (20.0) at 0.05 significant levels. The result of the findings indicated that undergraduate students from the federal, state and private Universities utilized flipped classroom for learning. The result of the independent t -test revealed that no significant difference exists between male and female undergraduate students perception of the usefullness of flipped class room for learning. These findings also revealed that no significant difference exist in undergraduate students 'perception of the utilization of flipped classroom for learning based on school proprietorship. Based on the findings, it was recommended that undergraduate student should adopt the use of flipped classroom since it a very useful technology for learning. Also, seminars, workshops and conferences should be organized for male and female undergraduates' students on the usefulness of flipped classroom for learning since the findings revealed no gender bias in the utilisation of flipped classroom for learning among others.

Keywords: Flipped Classroom, Perception, Gender Introduction

Introduction

The importance of education to mankind cannot be overemphasized, most especially in the critical moment of Technological breakthrough. Iloanusi and Osuagwu (2009) defined education as a major tool for national socio-economic growth and development. Their submission agrees with the National Policy on Education (NPE, 2014) which stressed the importance of education as an instrument of change NPE (2014), affirms the need to make education meet the needs of individual citizens and society at large. Education had been recognized as a fundamental right with far-reaching impacts on human development and social progress. Education is the cornerstone of sustainable development and it contributes to building a modern and thriving society (Idowu & Esere, 2013). Education also empowers communities and citizens to fully participate in development and prosperity. Education in its broadest sense is generally acclaimed as a tool that has a germane impact on the mind, character, or physical ability of an individual (Briggs, Ololube, Kpolovie, Amaele & Amanchukwu 2012).

Education is critical for economic growth, development and prosperity of any nation. It is not only the means by which individuals become skilled participants in the society, but also a key driver to expanding information and communication technology usage (United Nations Education Scientific and Cultural Organization, 2012). In a rapidly changing world, it is essential for an individual to be able to access and apply ICTs beyond computer literacy to achieving technological competence for successful integration of technology into the classroom so as to nurture the students to be participants in the growth process in this era of rapid change. Bola and Ogunlade (2012) submit that, the introducton of the internet and other forms of ICT to higher institutions of learning has enabled the creation of multimedia resources and the instantaneous communication of information.

Daniels (2002) opined that information and communication technologies (ICTs) have become within a very short time, one of the basic building blocks of modern society and many countries now regard the understanding and mastering of the basic skills and concepts as part of the core of education, alongside reading, writing and numeracy. However, the use of information and communication technologies in education is divided into two broad categories: ICTs for Education and ICTs in Education.

ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process.

Education has been affected by ICTs as reflected in teaching, learning and research (Yusuf, 2005). Onuma (2007) noted that information technology in education focuses on electronic generation, storage, retrieval, utilization and protection of information for future use. While information and communication technology revolves around different types of technology likely to be utilized for processing, transmitting and communicating information. ICTs are used for developing course material; delivering and sharing content; learners-teachers communication and the outside world; creation and delivery of presentations and lectures; academic research; administrative support, student enrolment among others. Emerging technologies have enhanced extensively the prospects that promote the learning process in ways which are not obtainable before now (Adegbija, Fakomogbon, & Adebayo, 2013)

Shavinina (2001) defines ICT as all the digital technologies, including: computer, scanner, printer, telephone, internet, digital satellite system (DSS),direct broadcast satellite (DBS), pocket-switching, fiber optic cables, laser disc, microwaves, and multi-media systems for collection, processing, storage and dissemination of information all-over the world. Information and communication technology entails all digital technologies that can be used to facilitate communication and information transmission. When these digital technologies are employed in education to facilitate learning, it enhances teaching and learning rates of the student. As opined by Mindflash, (2016) that it is harder to predict how the new distributed, democratized dynamic will change the nature of how or what people are actually learning.

There is a need to use internet in facilitating learning and this brought about the concept of flipped learning. We live in a society that embraces diverse, global, digital and hyper textual knowledge (Flores, Del-Acro, & Silva, 2016). The Internet and the digital world have brought about radical change in the way knowledge is accessed and transmitted. Learning has ceased to be an internal and individual activity, and has become an activity performed collectively, online (Siemens, 2005). We find ourselves in the era of a new paradigm of education, in which learning ceases to be an internal and individual activity and becomes an activity performed collectively, critically, in participation with others, and online. It is in this sense that the flipped classroom model arises. Jonathan Bergmann and Aaron Sams developed the flipped classroom model in 2006 in the Secondary School of Woodland Park, Colorado, where both worked as teachers (Bergmann and Sams, 2014). The concept has evolved since, and it has given way to a methodology that goeseyond the mere substitution of the classic lecture for a video (Carballo, 2014).

Robinson (2012) opined that it is necessary for schools to keep up with a changing technological landscape. Many educators have sought to accomplish this through the development of blended learning. (Ribson, 2016). Blended learning refers to the use of online or digital tools in conjunction with more traditional classroom Strategies (Napier, Dekhane & Smith, 2011). Although blended learning has been the subject of research for more than two decades, the capacity for implementation has been enriched due to the more recent innovation of the flipped classroom. Flipped classroom model seeks to shift class content outside the classroom, often in the form of lecture videos or readings, and in turn moves writing, projects or practice activities traditionally assigned as homework into the classroom. The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before the class session, while in-class time is devoted to exercises, projects, or discussions

Yacout, and Shosha, (2016) defined flipped Classroom as an instructional strategy which provides a new methodology and modality for teaching and learning, which constitutes a role change for instructors with a way of minimizing the amount of direct instruction in their teaching practice while maximizing one-to-one interaction and more cooperative and collaborative contribution to the teaching process which can improve and encourage social interaction, teamwork and cultural diversity among students. The roles of students have a corresponding change from passive participants to positive participation. Students watch video lectures before class and valuable class time is spent on active learning activities such as individual and small group exercises, application activities, case studies, discussions, and role playing. This inverted approach involves the students actively in course content during class time, and thus students are no longer inactive recipients as typically seen in traditional lectures. Flipped classroom therefore, has the potential of addressing the different learning styles of students (Yacout, and Shosha 2016).

The four pillars of FLIP are flexible environment, learning culture, intentional content and professional educator (Flipped Learning Network, FLP, 2014). The flexible environment denotes that flipped Learning allows for a variety of learning modes; educators often physically rearrange their learning spaces to accommodate a lesson or unit, to support either group work or independent study. They create flexible spaces in which students choose when and where they learn. Furthermore, educators who flip their classes are flexible in their expectations of student timelines for learning and in their assessments of student learning. Next is the learning culture, In the traditional teacher-centered model, the teacher is the primary source of information. By contrast, the Flipped Learning model deliberately shifts instruction to a learner-centered approach, where in-class time is dedicated to exploring topics in greater depth and creating rich learning opportunities. As a result, students are actively involved in knowledge construction as they participate in and evaluate their learning in a manner that is personally meaningful.

Intentional content, Flipped Learning Educators continually think about how they can use the Flipped Learning model to help students develop conceptual understanding, as well as procedural fluency. They determine what they need to teach and what materials students should explore on their own. Educators use Intentional Content to maximize classroom time in order to adopt methods of student-centered, active learning strategies, depending on grade level and subject matter. Lastly is the professional educator, the role of a Professional Educator is even more important, and often more demanding, in a Flipped Classroom than in a traditional one. During class time, they continually observe their students, providing them with feedback relevant in the moment, and assessing their work. Professional Educators are reflective in their practice, connect with each other to improve their instruction, accept constructive criticism, and tolerate controlled chaos in their classrooms. While Professional Educators take on less visibly prominent roles in a flipped classroom, they remain the essential ingredient that enables Flipped Learning to occur.

Nowadays, the flipped classroom offers more opportunities for students to develop critical and independent thinking, and for students to enhance their own learning processes by interacting collaboratively with peers. The first key element that ensures the success of the process is the development of a well-organized teaching plan, which specifies the activities that will be carried out, as well as the resources and contents that will be consulted (Flores,). In Bloom's revised taxonomy (2001), the students are doing the lower levels of cognitive work (gaining knowledge and comprehension) outside of class, and focusing on the higher forms of cognitive work (application, analysis, synthesis, and/or evaluation) in class, where they have the support of their peers and instructor. Undergraduate's students' perception on the use of technology for learning is well researched. Perception is the immediate or intuitive recognition or appreciation, as of moral psychological or aesthetic qualities. (Marc, 2015) defined perception as the improvement in performance of a task due to prolonged exposure of a particular training or a task. Kirk asserted that Instructors' perceptions, preferences and ability to use the available technology are all key factors that influence the composition of interaction within the online learning environment. Sue et al. observed that instructors understood that learner-instructor and learner-learner interactions were crucial for high quality online programs. Previous studies like that of Jones, 2009; Kaye, 2007; Wahid,2006; Kaye & Johnson, 2014; Papacharissi & Rubin, 2012 cited in Yacout (2016), have all shown that there are various reasons why students and the public use new technologies and their perceptions of the technologies.

School proprietorship to a large extent determines the provision of an enabling environment for the adoption and integration of internet technologies in education. It is an institutional factor which could motivate lecturers towards the utilization of internet technologies for instruction (Lumumba, 2007). The environmental conditions that necessitate the utilization of internet technologies however differ from school to school. Issues such as school's status, funding, provision of equipment, age and experience of tutors, gender, time and lack of adequate support for technical know-how among lecturers do arise from school proprietorship and are often identified as the impediments to successful integration of technology for classroom utilization.

The influence of gender in classroom utilization of technology also plays a major role in the selection, development and achievement of instructional objectives. Van Braak (2001) proposes that female students exude lower confidence or knowledge ability than males about using computers. Onasanya, Shehu, Ogunlade, and Adefuye (2011) assert that given the low level of utilization of ICTs for instructional purposes in Nigeria, male teachers are more computer literate and utilize ICTs for instructional purposes than their female counterparts. However, current trends and technological advancements have seen an uptake of equal parity in male and female use of of technlogical devices. A change gradually being felt even across the education sector.

Statement of the Problem

The need to make learning student centered and self-paced cannot be divorced in this present day technological advancement. Although there are a lot of benefits of using flipped classroom as a learning tools in higher institution of learning such potential benfits include; an increase in opportunities for interaction between students and teachers, a shift in the responsibility for learning onto the students, the freedom to prepare for the class at a time that suits them, the opportunity to revise the material and as many times as required, the ability to readily record learning resources, collaborative working between students, an increase in student engagement and a shift from passive listening to active learning. In spite of these entire benefits flipped classroom has not been utilized by undergraduates' students to enhance learning. Most undergraduate students use their mobile phones for irrelevant things such as viewing films from Youtube downloading irrelevant story from internet and so on. If there are instructional flipped class rooms that they can download to their mobile devices, it may improve their study habits and positively influence their performances in courses they offer. In Nigerian Universities, much has not been done in the area of instructional flipped classroom especially in employing it for learning by undergraduates' students. To the best knowledge of the researcher, there is dearth of studies on the students' perception of the use of flipped classroom for learning. It is in the light of this, that this study attempts to examine the perception of undergraduate students on the utilization of flipped classroom for learning in Kwara State.

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Purpose of the Study

The main purpose of this study is to examine perception of undergraduate students towards the use of flipped classroom for learning in Kwara state, Nigeria. Specifically, this study will:

1. Investigate the perception of undergraduate students in the utilization of Flipped classroom for Learning.
2. Determine the influence of undergraduate students' gender on their perceived usefulness of Flipped classroom for Learning.

3. Determine the influence of university proprietorship on undergraduate students' perceived usefulness of Flipped classroom for Learning.

Research Question

The study provides answers to the following research question;
1. What is the perception of undergraduate students towards the usefulness of Flipped classroom for Learning?
2. What is the influence of university proprietorship on undergraduate students' perceived usefulness of Flipped classroom for Learning?
3. Does undergraduate students' perception of the usefulness of Flipped classroom for Learning vary based on gender?

Research Hypotheses

Based on the research question 2 and 3, the following null hypotheses were formulated and tested at 0.05 level of significant in the study.

Ho_2:   There is no significant difference between male and female undergraduate students their   perceived usefulness of Flipped classroom for Learning.

Ho_2:   There is no significant difference among undergraduate students in federal, state and private universities on their perceived usefulness of Flipped classroom for Learning.

Methodology

The study was a descriptive research using cross sectional survey type. This method enabled the researcher to describe events just as they appear without the manipulation of external researchers. The method used for this study was survey method because it enabled the researcher to gather large amount of information about the use of mobile technologies for learning from the respondents. The target population consisted of all undergraduate students in three Universities in Kwara State namely: University of Ilorin, Kwara State University and Al-Hikman University. The sample size was all undergraduate students from the chosen Universities. Simple random sampling technique was used to select samples from the chosen Universities. Israel model (2013) was used to determine the sample size of the respondents used for the study.

The instrument for this study was a researcher-designed questionnaire and it was validated by three educational technology experts. The experts reviewed the questionnaire in order to determine the appropriateness, content coverage in terms of acceptability, adequacy and relevance to the stated objectives. Their comments, suggestions and corrections were used to produce a final draft of the instrument. The reliability of the questionnaire used in this study was achieved by administering twenty copies of the questionnaire on twenty undergraduate students in Ladoke Akintola University Ogbomoso, Nigeria which is not part of the sampled institutions. Cronbach alpha formula was used to test the reliability of the instrument at 0.91. The researcher personally administered 270 questionnaires to the respondents and was able to collect only 258 that is, 95% from the respondents. The collected data was analyzed using descriptive and inferential statistics. In analyzing the data collected, descriptive statistics was employed using SPSS 20.0 packages. Simple percentage, mean were used to analyze data for the research questions and the hypotheses were tested using independent *t*-test and analysis of variance (ANOVA). All hypotheses were tested at 0.05 level of significant.

Results

Research Question One: What is the perception of undergraduate students towards the usefulness of Flipped classroom for Learning?

Table1:
Perception of Undergraduates Students towards the usefulness of Flipped Classroom for Learning

S/N	STATEMENTS	Mean
1	The use of flipped classroom for learning will make my study more difficult	3.39
2	Using flipped classroom to learn will be frustrating	2.99
3	The use of flipped classroom will take more of my time than necessary	3.00
4	Using flipped classroom are effortless	3.09
5	Network problem will hinder lessons using flipped classroom	3.11
6	I can use flipped classroom in learning without written instructions	2.81
7	Flipped classroom usage is always cumbersome	3.42
8	Flipped classroom usage are easy to navigate	2.47
9	It is easy to become skillful at using flipped classroom in learning	2.90
10	Flipped classroom utilization in learning will be too complex	3.20
	Grand mean	**3.40**

Table 1 reveals that the use of flipped classroom for learning will make my study more difficult was ranked highest having the mean score of 3.39 out of 4. This was followed by the use of Flipped classroom usage is always cumbersome, that flipped classroom utilization in learning will be too complex and Network problem will hinder lessons using flipped classroom having the means of 3.42, 3.22 and 3.11 respectively. The lowest mean score was 2.47 (approximately 2.5) with the statement that Flipped classroom usage are easy to navigate.

However, the grand mean score for perceived usefulness was found to be 3.4. Using 2.5 as the average benchmark, it can then be inferred that undergraduates' students perceived the usefulness of flipped classroom in learning positively.

Hypotheses Testing

Based on research question 2-3 the following hypotheses were tested

Hypotheses One: There is no significant difference between male and female undergraduate students their perceived usefulness of Flipped classroom for Learning.

Table 2:
t-test of Male and Female Undergraduates Students on their Perceived Usefulness of Flipped Classroom for Learning

Gender	No	$\overline{\text{X}}$	SD	Df	T	Sig. (2-tailed)
Male	135	6.35	3.16	256	.95	.35
Female	123	4.32	2.10			
Total	258					

According to Table 2, t (256) = .95, p = .35. That is, the result of t-value of .945 resulting in .35 significance value was greater than 0.05 alpha values. This means that the stated null hypothesis is accepted. By implication the stated null hypothesis was established thus: There is no significant difference between male undergraduates students on their perceived usefulness of flipped classroom for learning. Based on the earlier mean score of the undergraduates' general perception, this means that both male and female lecturers had a high positive perception.

Hypotheses Two: There is no significant difference among undergraduate students in federal, state and private universities on their perceived usefulness of Flipped classroom for Learning.

In determining results to establish whether there was significant difference between experienced, moderately experienced and less experienced COE lecturers on their perceived usefulness of social media in instruction, data were analyzed using Analysis of variance (ANOVA) as shown in Table 33.

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Table2:
The ANOVA of perceived Usefulness of Flipped Classroom' for Learningamong Federal, State and Private Undergraduates Students

	Sum of squares	Df	Mean square	F	Sig.
Between Groups	234.61	2	141.34	3.04	.45
Within Groups	15129	256	36.61		
Total	15363.61	258			

Table 2 shows that there was no significant difference among Federal, state and Private. [F (2,256) = 3.04, p = .45]. This therefore meant that the null hypothesis was accepted because the significant value (0.45) was found not to be less than the alpha value (0.05). By implication, the null hypothesis was established thus: No significant difference exists between Federal, State and Private.

The study recommends that the government should give the necessary supports on the procurement of all needed flipped class room facilities for learning. Undergraduates' students in kwara state should help themselves by exhibiting high positive perception in the utilization of flipped classroom. Also, undergraduates' students should help themselves by making use of flipped class for learning purpose and shift their foci from using it for fun and entertainment.

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CHALLENGES ASSOCIATED WITH USE OFICTIN SECONDARY SCHOOLS AS PERCEIVED BY SOCIAL SCIENCE TEACHERS IN ILORIN

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Abstract
Social science deals with the socio-economic and political life of people that are concerned with society and relationship among individuals. Technology influences human activities as they influence their environment technologically to improve their standard of living. This study examined challenges associated with use of ICT in secondary schools as perceived by social science teachers in Ilorin metropolis. Descriptive survey research design was employed. Population for this study comprised all social science teachers in Ilorin. The sample for this study comprised 300 respondents through a stratified random sampling technique. A questionnaire titled "Challenges associated with the use of ICT in Secondary Schools (CICTSS)" was used. Its reliability was obtained using the test-retest method index of 0.78. Three research questions were raised, a research question was answered using mean and standard deviation while two corresponding hypotheses were tested using t-test statistic. Findings of the study showed that many challenges such as unavailability of computer laboratory, lack of instructional software, the inefficiency of teachers' technical knowledge, irregular power supply and poor maintenance of computer systems are the constraints in use of ICT facilities by social science teachers. The study also revealed that there is no statistically significant difference between male and female (t=0.29, p>0.05), and private and public social science teachers (t=0.26, p>0.05) on the challenges associated with the use of ICT facilities in schools. Based on these findings, it was recommended among other that regular workshops, seminars, and in-service training should be organised to improve teachers' efficiency on the usage of ICT.

Keywords: *Challenges*, *Social science teachers, Information and Communication Technology, Secondary schools*

Introduction
Education is the acquisition of appropriate skills and the development of mental, physical, social abilities and competencies as equipment for the individual to live in and contribute to the development of the society (NPE, 2013). Teaching and learning in secondary schools today are face with a lot of challenges. These include the change in perceptions about learning and application of ICT in the classroom. Many teachers see ICT facilities as tools meant for only subjects that are scientifically and technologically oriented whereas, ICT is an innovative techniques used to enhance and facilitate effective teaching and learning in schools. Teachers are not only to equip the learners with basic knowledge of subjects' content but also with higher cognitive skills, such as problem solving and critical thinking skills that allow for self-development, continuous learning and Information and Communication Technology (ICT) skills. This was emphasised in the curriculum of social science subjects, Nigerian Educational Research and Development Council (NERDC, 2007)

The Social Science is a branch of knowledge that focuses on the study of society, individuals and groups within the society. Social Science subjects study the relationships between and among groups in the society, the way they live as groups and as individuals. As an academic discipline, they are concerned with society and the relationship between individuals within a society. The subjects deal with the study of the social life of people or groups of individuals. They are a broad field of study and learning that has many branches within it. These include subjects like Geography, History, Economics, Social Studies, Government in secondary schools while Psychology, Political science, Sociology, Anthropology, Archelogy, among others in tertiary institutions.

Geography is the study of the earth's physical features and the people, plants and animals that live in different regions of the world. History is the study of the record or account of past events and developments. Economics is the study of the way goods and services are produced and sold; the way money is managed; the commercial activities of a society. Social Studies is the study of human interaction with the environment and how human influences and manages the environment through the application of technology in solving social problems. Psychology is the study of the mind and how it affects behaviour in a particular person or group of people. Political Science is the study of politics and the way political power is shared and exercised in a country. Sociology is the scientific study of human society, the way it is organized, and functions and the way people behave in relation to each other. Anthropology is the study of human societies, customs, and beliefs. Archeology is the study of ancient human society done by looking at tools, bones, buildings, and other things from that time that has been found through excavation of sites and analysis of physical remains (NTI, 2015).

Social science is known for its scientific way of learning and studying the society. Effective teaching and learning of the discipline requires innovative techniques such as Computer Assisted Instruction (CAI).

It emphasizes the use of innovative methods of teaching for better understanding of society. Sometimes, it uses figures and analysis, borrowing from Mathematics or Statistics. It adopts a systematic way in carrying out its activities on society, through data collection, field work and the analysis of what it finds out about the set-up in society through application of ICT. Social science curriculum contains teaching and learning materials that are ICT materials. These include: internet, CD-Rom, documentaries, simulation games, drill and practice, tutorials and information retrieval system, documentaries on family life education and simulation materials which are expected of social science teachers to facilitate and enhance teaching and learning of social science subjects (NERDC, 2007).

Variety of instructional materials has been used in the educational institutions. For example, chalk board, bulletin board, overhead projector and computer. In fact, computer is not one instructional material; it is combination of many instructional materials. For example, a lecture can be presented on power point, or other software, computer can be attached to a big computer screen and can be used as chalkboard. CD-ROM and floppy disks can be used to store huge amount of information, for example a picture, a simulation, a movie, diagram or a lecture can be shown in the classrooms. Internet and emails can be used in the classrooms as part of computer as an instructional material. Then teacher can go online and find relevant topics or a research based article. Computer games are another way a computer can be used as parts of computer based instructional materials (Malik, 2005).

Many teachers have been trained over the years on how to use ICT in the classroom as modern techniques of teaching. Many secondary schools in Kwara State were supplied with computers, notebooks, and software to enable teachers to bring technology into classrooms. Many new schools also have rooms specially equipped with computers for students to facilitate and enhance teaching and learning while some schools have been offering ICT training. Olaolu, Abdulrahaman and Habibatu (2012) discovered that out of one hundred selected secondary schools in Kwara State, in the year 2011, there were 2,109 computers of which 66 (60.5%) were functioning, while 843 (39.5%) were not functioning. Olokooba (2015) also found out that Computer Assisted Instructional materials (CAIM) for teaching social science subjects are characterised by documentaries, programmer-designed, manufactured software, internet-based materials but they are not frequently used by teachers for instructional purposes. In most of schools sampled in his study, it is only computer systems that are available and occasionally used for information processing and storage purpose only in secondary schools.

Furthermore, Ukpebor and Emwanta (2012) reported that the availability and use of computers and internet are very poor. Many secondary schools may boast of computer laboratory but only a few can pride themselves on the internet access. This is not far from Goldman, Cole, and Syer (1999), who claimed that most secondary schools have computer laboratories and many computers in the classrooms, but since internet services are the latest technology in the use of ICT, it becomes very difficult and remain a serious challenge to overcome in most school environment. Most of the schools who could boast of computers in their schools only had outdated computers from which a few were functioning. It is highly imperative that schools across the city should endeavour to acquire ICT facilities for practical and also internet access so as to empower the student on an educational pursuit.

Mehmet (2010) discovered that supports instructional applications in their classrooms. Use of the Internet and software programs such as Microsoft Power Point, Word, and Excel were the most common type of computer-supported instruction in the classrooms. In addition, computers were used as presentation tools frequently in the classrooms. Multimedia software was used by only one teacher. Findings of the study also showed that all participants had similar views about the computer as they did not differentiate it from any other instructional tools. Nevertheless, all of them agreed that the computer is a powerful research tool that facilitates students work and make the work faster and easier for the students.

Gulbahar and Guven (2008) discovered that teachers who sometimes and frequently use multimedia computer and computer-projector system in the classroom have a higher self-perception of efficacy than their counterpart that never uses them. Moreover, the groups that frequently use educational software and the Internet/Web environment have a higher perception of efficacy than the one who never used them. In other words, teachers who have high perception of efficacy tend to use ICT related tools in the classroom more frequently than the others. The study also examined the relationship between teachers' use of computer related tools in the classroom and level of expertise of teachers. Correlation analysis was conducted to determine if there is any relationship between teachers' use of computer related tools in the classroom and the expertise level of teachers. A one-way analysis of variance was conducted to evaluate the relationship between the level of expertise and computer related tools usage of Social Studies teachers in the classroom for each of the four tools: Multimedia Computer, Computer-Aided Educational Software, Computer-Projector System and the Internet/Web Environment. The results indicated that the groups that sometimes and frequently use computer related tools in the classroom have a higher level of expertise than the groups that never use them. In other words, teachers who have a high level of expertise tend to use computer related tools in the classroom more frequently than the others.

Similarly, Ukpebor (2010) conducted a study on use of Internet by private secondary school students in Benin City Cosmopolis, Edo State, Nigeria. His findings revealed that the level of internet access in schools is very poor. This is because the majority of the schools do not have access to the internet and while few who does, do not frequently allow students to have access to the technology.

Challenges Associated with the Use of ICT Facilities in Secondary Schools

Afolabi (2000) noted that both teachers and students are still novices in the rudiments of how the computer works. The following challenges according to Afolabi (2000); Onasanya, (2009); and Tugbiyele, (2011) are associated with the use of ICT in teaching and learning process.

a. Insufficient resources applied to ICT in schools
b. Poor preparation of classroom teachers to integrate ICT effectively or collaboratively
c. Ineffective attitude of school administrators towards the application of ICT in their schools
d. The need for students and teachers to develop finger dexterity which is common among typists
e. Lack of sufficient computer systems to go round the students due to exorbitant costs
f. The students' class enrolment which soars every year
g. The erratic nature of power supply in Nigeria
h. The natural tendency for human to oppose innovation at their first appearance
i. Laziness on the part of some teachers to learn ICT for instruction in schools

Onasanya and Asuquo (2007) worked on Secondary school teachers' perception of problems and challenges associated with web-based learning in Nigeria. Their findings showed that many of the secondary school teachers are not computer literate and that they are all ready to acquire the needed knowledge and skills if they would be allowed to participate in computer literacy education. Moreover, despite the fact that few of the teachers were computer literate, few of them used internet facilities. It therefore follows that they would want to know more about prospects of internet facilities for teaching and learning. However, the teachers see more disadvantages in web-based learning than they see advantages. Some of them considered the introduction of web-based teaching and learning as a threat to their jobs. They also think web-based learning would have bad influence on the student's social lives. They also considered lack of technical know-how as a challenge to the introduction of web-based teaching and learning in secondary school.

The study also revealed that the majority of participants are aware of the benefits of teaching with technology. They believe that the inclusion of technology into pedagogy can enhance their teaching quality. Zemsky and Massy (2004) assert that it can be a good indication of successful implementation of the technology integration program if teachers know about the benefits of technology for teaching and make frequent use of it in their instructional activities. However, there are still a few other participants who only mention the availability of technology facility as their reason for integrating technology into teaching. Teachers who only have this reason as the basis for teaching with technology will usually gain very little from the program because they may not realize the extensive benefits that technology can provide to enhance their professionalism. They are only motivated by the institution's generous policy which provides them with the latest model of laptops. Teachers of this type usually know only very basic things about computer technology.

Marwan (2008) conducted a study on Teachers' Perceptions of Teaching with Computer Technology: Reasons for Use and Barriers in Usage. His findings showed that teachers are faced with a number of problems or barriers in their teaching with technology. Most of these barriers are, in fact, directly linked to the institution's willingness to provide supports for teachers in addition to providing them with the technology facility. Several teachers mentioned that they lack the skills in operating computer technology. They can make use of the facility and feel the benefits of using it for their teaching but they also realise that they can even get more benefits if they have better skills in operating it. It is obvious that teachers need to be provided with technical training to help them become competent technology users.

Similarly, Mouza (2003) observed that training in technology is a critical ingredient in effective use of technology in the classrooms and lack of technical support is considered one of the major problems experienced by teachers in their teaching with technology. The technical support staff plays a very important role in ensuring the success of technology integration program implementation. It is every institution's responsibility to make sure that teachers are provided with adequate technical staff that is prepared to assist teachers whenever they experience difficulties with the technical equipment. Teachers should not get frustrated when using technology because, if they do, their teaching will be negatively affected. To reduce the frustration and eliminate challenges facing the teachers in the use of ICT in the classroom, this study examined the challenges associated with the Information and Communication Technology in secondary schools as perceived by social science teachers in Ilorin metropolis.

Methodology

The descriptive survey research design was employed in the study. This is necessary to be able to explain the variables in the study based on information gathered. The research was conducted in the Ilorin metropolis which is the capital of Kwara State. The population was all social science teachers in the metropolis. A sample of three hundred social science teachers was purposively sampled using stratified random sampling technique. A questionnaire titled "Challenges of using Information and Communication Technology in Secondary Schools (CICTSS)"was used for data collection. The questionnaire was classified to two sections. Section A of the questionnaire dealt with information about demographic data about the respondents on name of school, gender, school type, among others. Section B contained ten items on challenges associated with the use of Information and Communication Technology in Secondary Schools and was on a three point Likert scale of Strongly Associated, Associated and Not Associated. To validate the instrument, copies of the questionnaire was given to experts in Social Science disciplines in the Department of Social Sciences Education, University of Ilorin to ensure construct and content validity.

Its reliability was determined using test-retest technique and a reliability index of 0.78 was obtained. Three research questions were raised, one was answered using mean and standard deviation while the remaining research questions that have corresponding hypotheses were tested using t-test statistic at 0.05 level of significance.

Research Questions
1. What are the challenges associated with the use of ICT in secondary schools as perceived by social science teachers?
2. Do social science teachers differ on their perception on challenges associated with the use of ICT in secondary schools based on gender?
3. Do social science teachers differ on their perception on challenges associated with the use of ICT in secondary schools based on school type?

Research Hypotheses
HO_1: There is no significant difference between male and female social science teachers on the challenges associated with the use of ICT in secondary schools.

HO_2: There is no significant difference between private and public Social Studies teachers on the challenges associated with the use of ICT in secondary schools.

Results
Research Questions 1: *What are the challenges associated with the use of ICT in secondary schools as perceived by social science teachers?*

In order to answer research question one, responses of social science teachers on items 1 to 10 of the questionnaire on the challenges associated with the use of ICT in secondary schools were analysed using mean and standard deviation to determine the most challenges. The result is shown in table 1.

Table 1:
Mean and Standard Deviation on the Challenges Associated with the Use of ICT in Secondary School

S/N	ITEMS	N	Mean	Std. Deviation	Rank
1.	Insufficient time to prepare instructional materials based on ICT facilities	300	2.10	0.67	9th
2.	Inefficiency of teachers' technical knowledge to prepare ICT instructional materials	300	2.07	0.72	6th
3.	Unavailability of computer laboratory/computer systems for students' use in the school	300	2.25	0.71	1st
4.	Lack of or irregularity of internet facilities and connectivity in the school	300	2.06	0.74	8th
5.	Inefficient number of media for effective use of ICT	300	2.15	0.70	4th
6.	Shortage of computer systems needed by students and teachers in schools	300	2.23	0.76	3rd
7.	Lack of interest of teachers in the use of ICT	300	1.91	0.74	10th
8.	Poor technical knowledge and operation of computer systems	300	2.07	0.75	7th
9.	Lack of Computer -based Instructional software and packages in the school	300	2.15	0.70	4th
10.	irregular power supply and poor maintenance of computer systems in schools	300	2.25	0.74	1st

Table 1 showed the results of ranked means on each item of challenges on the use of ICT to determine the level of challenges associated with the use of ICT. Items 3 and 10 which stated that "Unavailability of computer laboratory/computer systems for students' use in the schools" and "irregular power supply and poor maintenance of computer systems in schools" were ranked first (1st) with mean scores of 2.25 and 2.25, and standard deviation of 0.71 and 0.74 respectively. Item 6 which stated that "Shortage of computer systems needed by students and teachers in schools" ranked third (3rd) with a mean score of 2.23 and standard deviation of 0.76. These are the major challenges or factors affecting the use of ICT by social science teachers as they are paramount. Item 46 which stated that "Lack of computer-based instructional software and packages in the school" ranked fourth (4th) with mean score 2.15 and standard deviation of 0.70.

However, the least of all the identified challenges associated with the use of ICT by social science teachers in upper basic schools is item 7 which stated that "Lack of interest of teachers in the use of ICT usage" ranked tenth (10th) with a mean score of 1.91 and standard deviation of 0.74.

Hypothesis 1: *There is no significant difference between male and female social science teachers on the challenges associated with the use of ICT in secondary schools.*

In order to test null hypothesis one, responses of male and female social science teachers on the challenges associated with the use of ICT in secondary schools were analysed using t-test statistic. The result was illustrated in table 2.

Table 2:
t-test Analysis of Male and Female Social Science Teachers on the Challenges Associated with the use of ICT in Secondary Schools

Variables	NO	Mean	SD	df	t-value	Sig. (2-tailed)	Decision
Male	132	36.81	9.70				
				298	2.51	0.29	NS
Female	168	20.90	1.50				

$P > 0.05$

Results in Table 2 showed that the calculated t-value 0.12, was obtained with p-value, 0.29 at an alpha level of 0.05. Since the p-value is greater than 0.05 alpha level (0.29>0.05), therefore, null hypothesis 1 is hereby accepted. This implies that there is the no statistically significant difference between male and female social science teachers on the challenges associated with the use of ICT in secondary schools.

Hypothesis 2: *There is no significant difference between private and public social science teachers on the challenges associated with the use of ICT in secondary schools.*

In order to test null hypothesis 2, responses of social science teachers on the challenges associated with use of ICT were analysed using t-test statistic. The results are as shown in Table 3.

Table 3:
t-test Analysis of Private and Public Social Science Teachers on the Challenges Associated with the use of ICT in Secondary Schools

Variables	NO	Mean	SD	df	t-value	Sig. (2-tailed)	Decision
Private	60	12.81	4.53				
				148	1.14	0.26	NS
Public	240	11.93	3.61				

$P > 0.05$

Results in Table 3 indicated the calculated t-value is 1.14 was obtained with p-value, 0.26 at an alpha level of 0.05. Since the p-value is greater than 0.05 alpha level (0.26>0.05), therefore, null hypothesis 2 is hereby accepted. This implies that there is no statistically significant difference between private and public social science teachers on the challenges associated with the use of ICT in secondary school.

Discussion of Findings

According to the results of the study, many challenges such as unavailability of computer laboratory, lack of instructional software, the inefficiency of teachers' technical knowledge, irregular power supply and poor maintenance of computer systems are a constraint in the use of ICT facilities by social science teachers. This is in line with findings of Ukpebor (2010) and Mouza (2003) who also discovered that teachers faced a lot of challenges in the use of technology in the classroom.

The finding of this study also revealed that teachers' gender is not a statistically significant variable on the challenges associated with the use of ICT in secondary school. This finding disagreed with Adekeye (2008) who discovered that a significant difference exists in the use of instructional resources between male teachers and female counterparts in the teaching of Social Studies and Umar (2010) whose findings also showed that a significant difference exists between male and female Islamic Studies teachers in the use of instructional media.

The study also revealed that there is no statistically significant difference between private and public social science teachers (t=0.26, p>0.05) on the challenges of using ICT facilities in secondary schools. This finding agrees with finding of Ukpebor (2010) who conducted a study on use of Internet by private secondary school students in Benin City Cosmopolis, Edo State, Nigeria. His findings revealed that the level of internet access in schools is very poor.

Conclusion

This study examined the challenges of using Information and Communication Technology in secondary schools as perceived by social science teachers in Ilorin metropolis. ICT facilities are recommended for teaching upper basic Social Studies curriculum to facilitate and enhance the learners' experience about the subject. Gender and school ownership are not statistically significant variables that have an influence on the challenges associated with the use of ICT in secondary school.

Recommendations

Based on the findings of this study, the following recommendations were made.

i.   Adequate ICT facilities should be provided to enhance and facilitate effective teaching and learning of social sciences subjects.

ii. Secondary school teachers should be encouraged to be computer literate and use ICT for teaching.

iii. Regular workshops, seminars, and in-service training should be organised for teachers to enable them to acquire the necessary skills and update their knowledge on the importance and proper use of instructional software in the teaching of social science subjects.

iv. Capacity building on the use of ICT should be mounted for teachers.

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ASSESSMENT OF STUDENTS' UTILISATION OF MOBILE TECHNOLOGY DEVICES FOR LEARNING IN KWARA STATE COLLEGES OF EDUCATION ILORIN, KWARA STATE

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Absract
The adequate and proper utilization of mobile technology devices proffer solutions to students' difficulties 'in instructional skills acquisition and knowledge at any citadel of learning. This study assessed students' usage of mobile technology devices in some Colleges of Education in Kwara state. Three research questions and two hypotheses were answered and tested respectively. The study was a descriptive research of the survey type. The Sample comprised of 150 students (92 Females and 58 Males) randomly selected from three Colleges of Education. Questionnaire was the instrument for data collection. Frequency counts, percentages and mean were used to answer the research questions', while chi-square was used for testing the hypothesis at 0.05. The findings showed that 73.3% of Colleges of Education students had at least a smart phone as a mobile device and 75% of Colleges of Education students made use of their smart phone. It also revealed that students had positive attitude towards the usage of mobile technology devices. However, there was no significant difference between male and female students in utilizing mobile technology devices; and no significance difference exists in utilization of mobile technology devices based on the location of schools. It was recommended that students should be guided to use mobile technology devices for educational pursuits
Keywords: Colleges of Education, Learning, Mobile Technology Devices, Utilization

Introduction

Mobile Technology devices have been recognised and adopted as the latest technology for instructional delivery and learning tools across the World. (Rikala, 2013 & Adedoja, and sundry to use them in a diverse institutions and environment for instance, in a classroom setting restaurants, café, and in a museum among others (Jacob &Issac, 2008; &Mahon, 2014).The Mobile technology concepts have been examined extensively with respect to diverse professional fields and applications. Educationally, El-Hussein and Cronje (2010) defined Mobile Technology as the integration and application of portable technology devices and wireless technology toward instructional services. Planet Retail (2012) emphasised that the integration of both hardware and software technologies step-up the attainment and usability of educational instruction among students. The adoption of   modern technology device in this generation up-grade their life style.

Professional training of teachers duly take place in accredited higher institutions worldwide. In Nigeria educational system, according to Eme-Uche (2006) Colleges of Education are part of the tertiary institutions responsible for the training of qualified teachers for the lower basic schools. Oyebade (2008) noted that successful teachers training programme at Colleges of Education entail three years academic session for full time students and four years academic sessions for part time.

Mobile Technology devices offer a number of advantages for acquisition and delivery of instructional objectives at any place and time. Santiago and Touron (2014) observed that Mobile Technology devices stimulate students towards learning and facilitate their home assignment. Wentzel et al. (2005) and Mueller et al. (2011) confirmed that they accelerate students' comprehension of the subject matter, improve their academic performance within and outside the school environment, and enhance students' educational experiences.

Students' gender differences determine their experiences in utilising Mobile technology devices for learning. Economides and Grousopoulou (2008) testified that male students prefer to make and receive calls only with mobile devices and access the internet with their computers; while female students mostly use mobile devices for taking pictures, text- messaging, interacting with friends, watching movies and making more phone calls than male students.

Literature Review

Mobile Technology devices are essential in facilitating mobile learning which refers to students' acquisition of essential skills and knowledge with Mobile Technology devices while on transit (UNESCO, 2013 & West, 2013). Olson et al. (2011) opined that Mobile Learning enable learners to learn anytime and anywhere without restriction to the four walls of classroom. Mobile Learning unfolds variety of ways learners learn with Mobile Technology devices to access e-libraries, e-conferences and other trustworthy educational resources. Mobile Technology devices for learning according to Mehdipour and Zerehkafi (2013); Marwan, Madar and Fuad (2013); and Transformyx (2017) are e-book; handheld audio and multimedia guides; handheld game console; Personal Digital Assistant (PDA); Tablet devices, laptop and notebook computer; and Phones.

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Assessment of Students' Utilisation of Mobile Technology Devices for Learning in Kwara State Colleges of Education Ilorin, Kwara State

Science and Technology innovations aid educators to transmit instructional messages in adaptable frequency via Mobile Technologies devices. Able and physical challenged students learn better with iPhones, mobile computers and android instructors. (Kim et al. 2013). Mobile Technology devices work effectively as expressed by Jeng et al. (2010) whenever the devices have wireless network connection, in-built camera, in-built GPS receiver and RFID reader.

Mobile Technology devices for effective instructional use are powered by the mobile applications (mobile apps) and technical/delivery support. Rashedul Islam et al. (2010) claimed that Mobile applications encompass aspects such as communication, games, multimedia, productivity, travel, and utilities possess great and vast advantages for various professional. Flora et al. (2014) stated that Third Generation Partnership (3GP), General Packet Radio Service (GPRS) mobile data service, GPS module, WiBro/mobile WiMAX, Wi-Fi, Bluetooth, cloud computing are technical and delivery support for Mobile Technology devices.

Feigin (2017) opined that Java ME, Symbian (UIQ & S60), Android, BlackBerry, OVI, Window Mobile, iPhone, LiMo, Angstrom distribution, Adobe Flash Light, BREW, OpenMoko, Palm OS (Garnet OS & Cobalt OS) and Palm webOS (Mojo) proffer development solutions to all type of Mobile Technology devices. Mobile Technology devices are inventing new technology which facilitates students' acquisition of skills and knowledge at all teachers training institutions. (Mehdipour & Zerehkafi (2013); and UNESCO, 2015).Chattopadhyay (2017) opined that Mobile devices are essentials for students' better training for better future competency. The use of Mobile devices increases students' access to job opportunities and proffer solutions to job challenges. Students' academic performance at higher institutions are strictly based on their attitude toward learning, gender status, parents' social economic status and institutional factors .Adeyemi and Adeyemi, (2014) discovered that students' performance at Colleges of Education are based on institutional factors, while Halder, Halder and Guha (2015) and Al-Emran, Elsherif and Shaalan (2016) emphasised that students' positive attitude towards Mobile technology devices ultimately enhance their excellent academic performance.

Kwara state is located in the North Central Geopolitical zone in Nigeria. The state accommodated all categories of educational institutions. (Kwara State Government, 2017).There are six Colleges of Education in Kwara State, they comprise Kwara State College of Education, Ilorin, Kwara State College of Education, Oro; College of Education (Technical), Lafiagi; Nigerian Army School of Education (NASE), Ilorin; Muyideen College of Education, Ilorin; College of Education, Offa. (National Commission for Colleges of Education, 2017)

Statement of the Problem

Colleges of Education students nowadays belong to the digital age. Mobile computing has been feasible throughout these students' educational careers. Majority of Colleges of Education students currently have access to various types of Mobile technology devices in their immediate environment. Most students currently underutilize installed mobile devices facilities and applications. Students purchase expensive mobile devices for the purpose of calling, text messaging, social networking, listing to music and watching video among others. Some students who have potentials towards utilisation of mobile devices for learning were discouraged by instability of mobile services, the internet facilities at the learning institutions were stolen by societal miscreants.
Therefore, these problems aroused the researchers' interest to assess the students' utilization of mobile technology devices for learning in Kwara State Colleges of Education.

Purpose of the study

The main purpose of the study is to assess the students' utilization of mobile technology devices for learning in Kwara State Colleges of Education.
Specifically, the study:
1. find out the type of mobile technology devices available to students in Kwara State Colleges of Education;
2. examine the students' attitude towards the use of Mobile technology devices for learning in Kwara State Colleges of Education; and
3. find out the influence of gender on the attitude of students towards the use of Mobile technology devices in Kwara State Colleges of Education

Research Questions

The following research questions were raised for the purpose of this study:
1. Which types of mobile technology devices are available for learning by the student in Kwara State Colleges of Education?
2. What are the attitudes of students toward the use of mobile technology devices for learning in Kwara State Colleges of Education?
3. What is the influence of gender on the attitude of students towards utilization of mobile technology devices for learning in Kwara State Colleges of Education?

Research Hypothesis

Based on the research questions, one hypothesis was tested.
HO₁: There is no significant difference between male and female students' attitudes towards utilization of mobile technology devices.

Research Design

The descriptive research of the survey type concentrated on the **assessment of students' usage of Mobile Technology devices in three Colleges of Education in Kwara State. Relevant information is sought from target population with a** researcher designed questionnaire.

Sample and Sampling Technique

An aggregate of One hundred and fifty (150) students were used as sample for this study. Fifty seven (57) students were selected from Kwara State College of Education, Ilorin; fifty (50) from Kwara State College of Education, Oro; and forty three (43) from Muyideen College of Education, Sango respectively with random sampling technique.

Research Instrument

A researcher-designed questionnaire was used to collect information from the respondents. The questionnaire was a four-point Likert scale consists of three sections. Section A sought for respondents' personal information; section B sought for types of Mobile technology available for respondents **learning** and section C was a four-point likert scale that consists of 15 items which sought to know respondents' attitude toward the use of Mobile Technology Devices for learning in Colleges of Education. The instrument for this study was face validated and it is coefficient in reliability using Cronbach Alpha technique which was 0.74

Data Analysis Techniques

The data collected for this study were analysed statistically. The Statistical Packages for the Social Sciences (SPSS) software was used to calculate frequency count, percentages, mean, standard deviation and t-test for this study.

Results
Table 1: Distribution of Respondent by Name of Institution.

Name of Institution	Frequency (N)	Percentage (%)
Kwara State College of Education, Ilorin	57	38.00
Kwara State College of Education, Oro	50	33.33
Muyideen College of Education, Ilorin	43	28.67
Total	**150**	**100.0**

Table 1 show that 38.0% of the questionnaires were administered at Kwara State College of Education, Ilorin; 33.3% at Kwara State College of Education, Oro; and 28.67% at Muyideen College of Education, Ilorin respectively.

Table 2:
Distribution of Respondent by Department

Department	Frequency (N)	Percentage (%)
Art and Social Science	36	24.0
Vocational and Technology	50	33.3
Science	19	12.7
Language	16	10.7
Early Childhood Education	23	15.3
Primary Education Science	06	04.0
Total	**150**	**100.0**

Table 2 shows the Distribution of respondents by Department. The table revealed that 36(24.0%) of the respondents are from Art and Social Science department; 50(33.3%) from Vocational and Technology department; 19(12.7%) from Science; 16(10.7%) from Language department; 23(15.3%) from Early Childhood Education department; and 6(4.0%) are from Primary Education Science department.

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Table 3:
Distribution of Respondents by Sex

Sex	Frequency (N)	Percentage (%)
Male	58	38.7
Female	92	61.3
Total	150	100.0

Table 3 shows that 58(38.7%) of the respondents were males, while 92(61.3%) were females. This shows that there were more female respondents than males respondents.

Table 4:
Distribution of the Respondent by Level

Level	Frequency (N)	Percentage (%)
100	35	23.3
200	97	64.7
300	18	12.0
Total	150	100.0

Table 4 shows that 35(23.3%) of The respondents were 100 level students; 97(64.7%) were 200 level students; while 18 (12.0%) of them were 300 level students.

Research Question One
What types of mobile technology devices are available for learning in Kwara state Colleges of Education?

Table 5:
Types of Mobile Technology Device Available for Learning

What types of mobile devices do you have?	Frequency (N)	Percentage (%)
Smart Phone	110	73.3
Basic Phone	016	10.7
MP3 Player	004	02.7
Digital Camera	004	02.7
Tablet (ipad, Galaxy, etc.)	006	04.0
Others	010	06.7
Total	150	100.0

Table 5 shows that 110(73.3%) of the respondents have Smartphone, 16(10.7%) of them have Basic Phone, 4(2.7%) have mp3 player, 4(2.7%) have digital camera 6(4.0%) have tablet (ipad, Galaxy etc.), and 10(6.7%) have other gadgets.

Table 6:
Types of Mobile Technology Devices Available for Learning

If you have a smartphone, can you do without it?	Frequency (N)	Percentage (%)
Yes	75	50.0
No	75	50.0
Total	150	100.0

Table 6 shows that 75(50%) of the respondents can do without their smartphone and 75(50%) cannot.
Research Question Two
What are the attitudes of students toward the use of mobile technology devices for learning in colleges of education?

Table 7:
Attitudes of Students toward the Use of Mobile Technology Devices for Learning

S/N	Items	Mean	Std. D
1.	Learning with mobile technology devices is boring to me	2.760	0.994
2.	Mobile technology devices are only useful for research	2.847	0.932
3.	Using mobile technology devices is often frustrating	2.687	0.883
4.	I would like to learn more about mobile technology devices	1.767	0.618
5.	Mobile technology devices are not really useful to my discipline	2.840	0.920
6.	Working with mobile technology devices makes me tense and uncomfortable	2.633	0.979
7.	Some mobile technology devices will be of no use to me in Nigeria because of its limited availability	2.687	0.903
8.	Using mobile technology devices could provide me with Information that lead to better research decision	1.593	0.625
9.	I enjoyed working with mobile technology devices	1.667	0.598
10.	Using mobile technology devices give me greater control over course of study	1.820	0.760
11.	I feel at ease when I am working with mobile technology devices	1.927	0.752
12.	Using mobile technology devices requires mental effort	2.207	0.846
13.	Exposure to mobile technology devices will help me learn effectively	1.820	0.625
14.	I do not like any of the mobile technology devices	3.033	0.958
15.	I find learning interesting whenever I am using mobile technology devices	1.653	0.705
	Grand	2.263	0.807

Table 7 shows the respondent responses on **attitudes of students toward the use of mobile technology devices for learning**. The findings from this table revealed that respondents "find learning with mobile technology devices boring" (2.760, 0.994); "Mobile technology devices are only useful for research" (2.847, 0.932); "Using mobile technology devices is often frustrating" (2.687, 0.883); "would like to learn more about mobile technology devices" (1.767, 0.618); "Mobile technology devices are not really useful to their discipline" (2.840, 0.920); "Working with mobile technology devices makes them tense and uncomfortable" (2.633, 0.979); "Some mobile technology devices will be of no use to them in Nigeria because of its limited availability" (2.687, 0.903); "Using mobile technology devices could provide them with information that lead to better research decision" (1.593, 0.625); "They enjoyed working with mobile technology devices" (1.667, 0.598); "Using mobile technology devices give them greater control over course of study" (1.820, 0.760); "They feel at ease when they are working with mobile technology devices" (1.927, 0.752); "Using mobile technology devices requires mental effort" (2.207, 0.846); "Exposure to mobile technology devices will help them learn effectively" (1.820, 0.625); "They do not like any of the mobile technology devices" (3.033, 0.958); and "They find it interesting whenever they are using mobile technology devices" (1.653, 0.705).

Hypothesis Testing
H_{oi}: There is no significant difference between male and female students' attitudes towards utilization of mobile technology devices.
Table 8:
Difference between Male and Female Students' Attitudes towards Utilization of Mobile Technology Devices

Gender	N	Mean	SD	Df	T	Sig. (2-tailed)	Remarks
Male	58	3.946	9.6782				
				148	-6.425	.008	Accepted
Female	92	2.986	11.6333				

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Table 8 revealed that degree of freedom (df) is 148, t-test is -6.425, p is 0.008. The hypothesis was accepted because the significant p-value of 0.008 was less than 0.05 alpha level. Therefore, there is significant difference between male and female students' attitudes toward utilization of mobile technology devices.

Discussion of Findings

The findings for this study revealed that majority of students at Kwara state Colleges of Education have smartphones as communication and research devices. This result is in accordance with Kim et al. (2013); Mehdipour and Zerehkafi (2013); Marwan, Madarand Fuad (2013); and Transformyx (2017) who postulated that mobile technology devices manufactured with numerous ad-on and solution applications are good for acquisition of instructional skills and knowledge.

Also, findings revealed students' attitudes toward use of Mobile Technology devices for learning at Colleges of Education. The results show that some students did not like any of the mobile technology devices for learning; and are uncomfortable and tense working with mobile technology devices. This finding contradicts Al-Emran, Elsherif and Shaalan (2016) who stressed that student's attitude towards Mobile technology devices ultimately enhance their excellence academic performance.

Finally, there is significant difference between male and female students' attitudes towards utilization of mobile technology devices for learning. Economides and Grousopoulou (2008) confirmed that there is significant difference between male and female students' attitudes toward learning with mobile technology devices.

Conclusion

Attainment and utilisation of Mobile technology devices by students in higher institutions serve as a catalyst that facilitates the acquisition of instructional skills and knowledge at any time and place. In conclusion, the findings reveal that student have negative attitude toward the utilization of mobile technology devices for learning; majority of students have Smartphones as communication and research devices; and there is significant difference between male and female students' attitudes toward utilization of mobile technology devices for learning.

Recommendation

Based on the findings of this study, the following recommendations were made:-

1. Students should be encouraged and conditioned to use mobile technology devices for research and learning purposes rather than using it to chat, playing games, taking photographs, listening to music and watching video
2. Students should maintain the positive attitude by updating their knowledge on the use of mobile technology devices for learning.
3. Partnership with a mobile network that will reduce the cost of the device and data Plan for students.

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MOBILE AND COMMUNICATION DEVICES INTEGRATION IN FORMAL AND NON FORMAL EDUCATIONAL SETUP

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Abstract
The integration usage of information and communication technologies such as mobile devices, laptop, electronic payment machine, scanning device, etc. in formal, and non-formal educational setup as overtaken human activities and skills acquisition in our contemporary society, While this paper will examine teachers', learners', and general user on how business education, social media communication, general platform communication, coded languages communication and lastly on how to improve on teaching and learning processes through the use of the above mentions devices. There is a widespread view that information and communication technology in teaching favors several teaching and learning processes. In particular, It help to contribute to the improvement of teaching and learning processes in the schools, organizations, industry and cooperate entities'' that have integrated information and communication technology as an innovation factor. To attain this highest level implies that a schools or non-educational setup in our environment will not only has to modernize the technological tools, but also has to change the technological devices been use to integrate communication for easy accessibility and usage and teaching-learning process. The teacher's role in issues regarding classroom organizational, the teaching and learning processes, and the interaction mechanisms are among several other factors relating to the uses of information and communication technology in education were discuss.
Keywords: *e-education, ICT, weblog, Technology, integration, methodology, teachers and learners. Tools, Mobile devices,*

Introduction
The significant role of Information and Communication Technology (*e-education*) especially in the process of innovation and empowering the technology into the educational activities cannot be over emphasis. Education sector can be the most effective sector to anticipate and eliminate the negative impact of Information and Communication Technology. Technology (e-education) in another side can be the most effective way to increase the student's knowledge and self-development toward there carrier in life.

Being aware of the significant role of Information and Communication Technology (e-education) in our life, especially in the educational activities, education administrators should take a step toward a successful implementation and a strategies approach to empower in Information and Communication Technology enhancing the process of teaching and learning in general. Information and Communication Technology is not just a tool in educational sectors, but it's a main-born to improve effective and meaningful educational process.

The main purpose of the Strategy for Information and Communication Technology Implementation in Education is to provide the prospects and trends of integrating information and communication technology into the general educational knowledge. There are some unavoidable facts in the modern education sectors such has;

a. **Rapid Improvement:** the Information and Communication Technology improved very rapidly, Therefore, in order to balance it, the whole educational system should be reformed and Information and Communication Technology should be integrated into all educational stages (level).

b. **Mobile:** the influence of Information and Communication Technology especially in mobile devices (open source tool) cannot be ignored in our student's lives. So, the learning activities should be reoriented and reformulated, from the manual source centered to the open source ones. In this case the widely use of mobile devices access has been an unavoidable policy that should be anticipated and inculcated by schools (tertiary institutions) to their curriculum tools.

c. **Integration of Games**: the presence of multimedia games and online games with mobile devices has been another serious problem that should be wisely handled by the educational institutions. The students cannot be exterminated from this case. They can have and do with it wherever and whenever they want. Schools, as a matter of fact, do not have enough power and time to prevent or stop it after school times. Meanwhile, most parents do not have enough times to accompany and control their children usage of mobile devices for simulations and games. So, the students have large opportunities to do with multimedia games or online games or browsing *the negative and porn sites*. Having been addicted, the students will have too little time to study, and even do not want to attend lectures.

In such scenario, education institutions play an important role to reduce these challenges. One of which is by facilitating the students to do edutainment or educational games. Schools can let their students be familiar with educational games adjusted by their teachers. Besides, they can also support and facilitate their students to have their own blogs in web.

A lot of Weblog providers are free to the users; visit Google for more details on free weblog. In their blogs, the students can create and write something, like an article, poem, news, short stories, features, or they can also express their opinion by an online forum provided in the internet. By doing so, I think our young generation will get more and more information and knowledge by browsing in the internet. They can also create innovation in web design that it may be out of the formal curriculum content, but it will be useful for their future.

d. **Chant altitude by Africa leaders:** the implementation of Information and Communication Technology in education has not been a priority trend of educational reform and the government paid little attention to it. Therefore, there should be an active participation and involvement, initiative and good will of the schools with the government support and various institutions to enhance Information and Communication Technology implementation in all school both in states and local government area.

e. **Failure of teacher as educational motivator:** the teachers should be the main motivator and initiator of Information and Communication Technology the implementation in all our institutions and arms of learning. The teachers should be aware of the social change in their teaching activities by participating in various training program on latest development and initiations. They should be the agent of change from the analog system of teaching to the digital ways with the help of Information and Communication Technology. They must also be the part of the global change in learning and teaching modification.

The followings are the aim and objectives of i.c.t implementation in education:

a. to motivate students towards learning: e-education make teaching and learning fun by simulating and attracting the attention of students due to hands, body, brain and all part of human are focus on the gadget or device, this make the students to show willingness towards learning because it also make learning real.

b. to reduce verbal illustration and description of an ideal: Majority of teachers spent more time to teach a particular concept in education by making verbal or pictorial illustration of subject but the advents of e-education will clarify the concept and make real time illustration without time wasted.

c. to preserve learning and teaching times: In adopting e-education, learning period are preserve by teaching a particular concept within the stipulated period and no time wasted as well.

d. to help to update individual skills and knowledge: Teacher is up to date on their subject matter because e-education provides global learning environment and community base learning forum.

e. it helps in self-pace learning: With the help of e-technology and computer base learning like computer assisted instruction, a program is design for particular students and time pace will be embedded so as to learn base on their cognitive understanding and level intelligent.

Predominant Advantage

a. It enhances educational society in realizing their objective: Schools and colleges in Africa are more analogue in administrative duties than digital while e-education provide easier and a more friendly administrative duties with the adoption of information and communication devices that are software clone.

b. it provide higher quality of trained leaners and teachers: E-education help the teacher to stay up to date in their area of specialty by improve them educational wise and knowledge acquired.

c. it help self-reliance and entrepreneurships skills:

Students with e-education are self-reliance and entrepreneurships in various skills of information and communication technology innovation.

Limitations

a. lack of computers and electronic devices for instructions,

b. lack of train and re-training seminar for teachers,

c. lacks of funds,

d. laziness altitude of teachers,

Guideline for Successful Implementations of Mobile and Communication Integration for Learning in Africa

1. Compulsory implementation of computer subject from primary level of education to tertiary level.
2. Preparing the educational environment towards Information and Communication Technology implementation.
3. Funding of e-education at all level of education.
4. Other includes skills flow, clarity of subject specialty by students, recognition of computer as valuable tools and skills in hardware and software maintenance.

Conclusion

e-education offer a great challenges in environment and societal reform through the uses of I.C.T devices by inculcating all form of learning and teachings devices in it devices and gadgets and also enriching the quality of instructional and educational reform to both the teacher and learners ,despite the setback challenges in e- education in Africa.

Africa of 21th century should be able to boast of education of an educational mechanism with innovative ideals and technological driving force of personnel, development in education and e-training in Africa countries should keep valuable pace with development in e-technology.

Recommendation;

Base on the result of this study, its recommends the following:

1. Government in Africa should ensure adequate funding in the area of training and re-training of teacher on e-education.
2. Government in Africa should encourage the purchase and implementations of hardware and software devices for education purpose, because e-technology is an investment in Africa development not a cheap.
3. Government and relevant governing body in schools, colleges and universities should enhance students learning by providing e-technological devices for them at the initiation of their enrolment into various course of study.
4. Government and relevant bodies should encourage and give opportunities to students discover fact through electronic-media.
5. Teacher and tutors should encourage the uses of multi-media devices as a tool of leaning among their students.
6. Teachers should make learning and teaching process a more interactive arena with the uses of e-media devices.
7. Government should make the teaching and learning environment a more conducive atmosphere for e-technology.
8. Government in Africa should finance Information and Communication Technology utilization across schools and the outcome should be report to the government for appropriate evaluations
9. Schools in Africa should solicit for educational aid sponsorship from international and local body so as to reduce the burden from the government and improved the learning system.
10. Full adoption of information and communication technology should be implemented in schools

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IMPACT OF COMPUTER BASED TEST IN NIGERIA TERTIARY INSTITUTIONS: A THEORETICAL VIEW

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Abstract
The impact of computer based examination in Nigeria tertiary institutions cannot be overruled since research established the roles and immense contributions of ICT for instructional purpose in Nigeria education. The author submitted that though Nigeria still experiences the problems of integration in some tertiary institutions in Nigeria due to many factors. The paper also explored the conceptual meaning of Computer Based examination, historical development of computer based examination, advantages of computer based testing in education and problems of computer based examinations in Nigeria educational institutions. Based on the following considerations, conclusion and recommendations were made.
Keywords: Impact, Computer Based Examination, Tertiary Institutions, Theoretical View.

Introduction

During the past few years, technology has significantly reshaped the method of assessment. In many academic domains, educational measurement has been moving towards the use of computer-based testing (CBT), defined as tests or assessments that are administered by computer in either stand-alone or dedicated network, or by other technology devices linked to the internet or world wide web most of them using multiple choice questions (MCQs). Computer based tests have been used since 1960s to test knowledge and problem solving skills. Computer based assessment systems have enabled educators and trainers to author, schedule, deliver, and report on surveys, quizzes, tests and examsThere are two main types of computer based testing. The most familiar type is where candidates fill in their responses on a paper form, which is fed into a computer optical mark reader. This reads the form, scores the paper, and may even report on the test reliability. The second type of computer based testing is where computers provide an assessment interface for students: they input their answers and receive feedback via a computer.(Jimoh, AbdulJaleel, &Kawu, 2012).

Computer Based Test (CBT) is not just an alternative method for delivering examinations; it represents an important qualitative shift away from traditional methods such as paper based tests. Despitethese advantages available in computerized test administration as it was shown that, it does not mean that CBTs are intrinsically better than paper-and-pencil tests. Previous study by have even found that testing format does not affect test scores and as such CBT can be considered a valid and acceptable testing mode. As CBT began to be used for summative assessment, establishing whether computer based testing performance was comparable to that of paper based assessment became important.

The Conceptual Meaning of Computer Based Examination

Computer based examination requires a system of interconnected computer networks that the Standard Internet Protocol Suite (SIPS) to serve the users. Computer systems which are used for CBT are made of two major components for them to carry out their functions as delivering examination questions they help to store examination questions and allow students to access them. The two parts are hardware and software. Computer hardware refers to the physical components of the computer i.e. the aspect of computer that can be seen, touch and felt. While software refers to the set of instruction that are fed into the system which enable the computer to process information or data, and these are application software (Williams, 2007).

Bennett (2015) asserted that computer based test represent a modern way of answering an examination questions, replacing the written pen and paper (PNP) format. CBT is a combination of networks, hardware and software as well as means of communication, collaboration and engagement that enables the processing, management and exchange of data, information and knowledge. It can be understood to be a complex of artificial techniques and knowledge for solving instructor's problem involving marking pen and examination (Bennett, 2015).

Computer – based tests (CBT) are the form of assessment in which the computer is an integral part of question papers' delivery, response storage, marking of response or reporting of results from a test or exercise. Conole and Warburton (2005) defined CBT as 'the use of computers for assessing students' learning'. It is required to think, re-consider, and modify or change the traditional test manners. Electronic assessment tools had reduced the load of teachers and facilitate exams execution purposefully because of inclusion of ICTs in education. CBTs can be applied to promote further efficient learning by examining students' knowledge and understanding in many fields.

Students' prior experience in computer and communication skills is essential matters in CBTs. CBT are a method that may does not suit the learning styles of many students. The primary factor in determining whether an assessment program is beneficial or not depends on whether the assessment tasks are relevant to the purposes and learning outcomes for the course, not forgetting the attitudes and skills that are to be examined. Computer and related technologies provides a powerful tool to encounter the challenges of designing and implementing assessments modes that go beyond the conventional practices and facilitate accessing a widely sources of information,cognitive skills and knowledge (Sonntag, Sinacore, McNulty2011).

CBTs are written to test specific levels of ability they have the potential to deliver more accurate and reliable results than traditional exams". Traditional methods of assessment are being changed by automated assessment in all over the world progressively but it is not clear so far to up to what extent these changes will be fruitful to the academicians and administrators of HEIs, in addition to that, institutions across the globe are migrating toward the use of (CBT) to test students' knowledge (Conole and Warburton 2005).

Historical Development of Computer Based Examination

From the punctual, a considerable length of time of instructive registering in the 1960s it might have been envisaged that exams or tests might be completed around computers, yet all the normally this just recognized completing on the PC what might have been generally completed on paper. That is, the PC might available inquiries on which learners might kind done An reaction Possibly Toward selecting from An rundown for alternatives or writing enlarged content (Ilesanmi&Lasisi, 2015). Throughout the years different courses in which appraisals could be encouraged by utilizing PCs have been visualized and as a rule attempted (Clarke-Midura and Dede, 2010). Pilots and specialists frequently do PC based exams utilizing test systems, some oral dialect exams have included "talking" into the PC (Pearson Instruction Australia, 2012), drawing and varying media computerized apparatuses have been utilized to present and record exhibitions, and the e-scape extend in the UK had understudies utilizing versatile PCs to record their advance chipping away at handy work (Kimbell, Wheeler, Mill operator, and Pollitt, 2007).

In short, an exam should measure some sort of performance and there is a multitude of ways in which this could be done on a computer system using the range of hardware, software and networking options now available. For example, a computer-based exam could be delivered on a stand-alone personal computer or within an isolated Local Area Network (LAN) or use online technologies such as web-pages over the Internet. Technical and administrative methods can be used to assure security and fairness (McNulty et al., 2011). The increasingly sophisticated range of peripheral devices can provide audiovisual and kinaesthetic support to collect a large range of types of student responses and evidence of performance.

For more than a decade researchers at the Centre for Schooling and Learning Technologies (CSaLT) at Edith Cowan University (ECU) have grappled with the multitude of ways in which digital technologies can be used to improve assessment, including with computer-based exams (Newhouse &Njiru, 2009). In so doing we have identified a number of categories of exams or exam items. Traditional exams are based on response items but an exam could include performance tasks or be based on the production of an artifact(s). Computer-based response items can provide stimuli using a full range of sensory forms and can allow responses in text, graphic, audio and kinaesthetic forms. Performance task items may involve recording a representation of a performance (e.g. making an audio recording of a talk), simulating a performance on the computer (e.g. demonstrating capability in using virtual equipment), or in some cases the performance is in using software on the computer (e.g. an ICT literacy test). Similarly production items may involve recording the process of production and/or representing the final artifact(s) (e.g. e-scape project (Kimbell et al., 2007)). Naturally in practice the distinction between these categories of items is not always clear and there may be some blending.

There have been trials of different types of PC based exams in various nations including the UK, Norway, Denmark, USA and Australia. In Australia a PC based test was utilized to survey the PC proficiency of 12 and 16 year-old understudies (Clerical Committee on Instruction, Work, Preparing and Youth Undertakings, 2007).The test was developed around a simulated computer environment and utilized using sets of networked laptop computers. While the test was successfully implemented with over 7000 students this was over a long period of time and would not be readily scalable. Also the use of a simulated environment would be expensive and difficult to provide a great enough variety of activities each year. The trial in the UK also involved a multi-million pound simulated system but was accessed by students through their school computers (Boyle, 2006). In the Norwegian illustration understudies utilized their own legislature gave journal PCs (English Telecom Company, 2009). In the USA progressively national testing is PC based and PC education will be incorporated inside national testing as is as of now the case in various states (Clarke-Midura and Dede, 2010; Harris, 2008).

Computer-based exams are a part of e-assessment that Ripley (2009) defines as "the use of technology to digitize, make more efficient, redesign or transform assessments and tests" that includes "professional examinations, qualifications, certifications and school tests, classroom assessment and assessment for learning". He proposes that there are two "drivers" of e-assessment being "business efficiency" and "educational transformation". E-assessment driven by business efficiency will tend to use digital technologies to support the same forms of assessment traditionally done on paper such as multiple-choice and short answer items. Where the driver is educational transformation then it is likely that the e-assessment will take on different forms and designs to suit the outcomes or the performances to be assessed.

The history of computer-based testing began in the early 1970s with the introduction of the early computers in the 1970s which revealed the potentials of using technology not only for new learning environments but also for completely new settings in the design and administration of tests. E-assessment originated with the PLATO system from the University of Illinois and was commercialized by Control Data Corporation in the 1970s, starting with a computer testing system for National Association of Securities Dealers (now the Financial Industry Regulatory Authority). The testing business grew slowly and is today known as Thomson Prometric. Further expansion of the testing system was occasioned by Pearson VUE in 1994 which was one of the first to use the internet for CBTS. Today many universities and institutions employ the use of computer based testing.

Advantages of Computer Based Testing in Education

Computer-based tests offer a few advantages over conventional paper-and-pencil or paper-based tests. Innovation based appraisal give chances to gauge complex type of learning and thinking that is impractical to connect with and survey through conventional strategies (Alabi, Isaa, & Oyekunle, 2012). In Nigeria, bosses now direct inclination test for occupation searchers through electronic means; the colleges and other tertiary establishments are enrolling and leading electronic examination for their understudies through the web and other electronic and systems administration devices. Correspondingly, extraordinary examination bodies in the nation, for example, West Africa Examination Council (WAEC), National Examinations Council (NECO), National Business and Technical Examination Board (NABTEB), and National Teachers' Institute (NTI), among others enroll their understudies through electronic means (Olawale and Shafii, 2010). Computer and related innovations give capable instruments to address the new difficulties of outlining and actualizing appraisals techniques that go past the customary practices and encourage recording a more extensive collection of psychological aptitudes and information (Mubashrah, Tariq &Shami, 2012).

Computer based testing can encourage the improvement of more legitimate evaluations. CBT has the possibilities of guaranteeing viability and effectiveness in instructing, proficient advancement, certainty and direct criticism. Computer have changed the way we work, be it any calling(Mubashrah, Tariq &Shami, 2012).

Computerized standard testing likewise gives leeway in booking, since tests can be managed in a great deal less time than it takes to regulate a paper test. This makes testing more open to those with all day employments or full class plans. Since the calendar can be packed, more test dates can be given consistently. The prompt and calculation and accessibility of test scores makes it workable for test takers to anticipate their subsequent stages directly in the wake of taking the exam. CBT assumes a key part in the cutting edge arrangement of Education. The way toward learning has gone past noting examination inquiries with pen and paper. Online examination has changed the instruction business. It has made the fantasies of separation taking in a reality. Examination is not any more constrained to paper and pen organizes (Johnson, 2009).

By and large, focal points of CBT frameworks over conventional paper-and-pencil testing (PPT) have been shown in a few similar works and as specified by, CBT is not only an option strategy for conveying examinations, it speaks to an essential subjective move far from customary techniques, for example, paper based tests. Regardless of, these preferences accessible in computerized test organization as it were demonstrated that, it doesn't imply that CBTs are characteristically superior to paper-and pencil tests. Past review by have even discovered that testing group does not influence test scores and all things considered CBT can be viewed as a substantial and worthy testing mode. (Dede, 2008) highlighted the beneath focal points of Computer Based Testing.

Changed Measurement: Standardized tests regularly are condemned as simulated and unique, measuring execution in routes separated from certifiable practices. In any event some of this feedback is because of the requirements that paper based organization forces upon test engineers. Paper is confined to showing static content and designs, offers no genuine methods for cooperating with the examinee, and forcefully restrains the courses in which examinees can react. Computers can free test engineers from these limitations. Computers can introduce sound and movement, cooperate powerfully with examinees, acknowledge reactions through an assortment of modes, and even score those reactions consequently. For instance:

✓A test evaluating dialect capability can gauge not just how well understudies can read and compose, additionally their capacity to grasp talked dialect, talk, and even speak.

✓A science test can enable understudies to outline and lead mimicked analyzes as a methods for reacting.

✓A medicinal affirmation exam can enable examinees to intelligently assess, analyze, treat, and oversee recreated patients.

✓A written work test can enable understudies to compose and alter their expositions in a well-known word-processor condition (rather than the undeniably less recognizable pen-and paper).

Moreover, the computer can score that paper consequently and immediately give the understudy particular, analytic criticism, combined with guideline for development.

Improved Measurement Precision and Efficiency: Certain sorts of CBTs can change not only the way of what is measured, but rather the estimation procedure itself. The way to doing as such is, once more, the capacity of the computer to associate with and tailor itself to the understudy being tested. A CBT with these capacities is named versatile. As a versatile test continues, answers to prior inquiries figure out which inquiries are asked later. The test hence logically changes as the understudy's execution level is slowly uncovered.

Increased Convenience: The third major benefit of computerized testing is operational convenience for students, test administrators, and those who use test scores. These conveniences include:

✓ Self-administering. Regular paper-and-pencil tests for the most part oblige somebody to disseminate test booklets and answer sheets, monitor time points of confinement, and gather materials after the test closes. Overseeing a CBT can be as straightforward as stopping an understudy before a computer. The computer can gather recognizable proof information, situate the understudy to the testing procedure, manage and time the test, and deliver a score report at the conclusion. Diverse understudies can sit next to each other taking distinctive tests with various time limits for various purposes. With customary organization, these two understudies may should be tested at various circumstances or in better places.

✓ Immediate scoring. The estimation of any data debases after some time. A score report based on a test taken a month and a half prior is a portrayal of what that understudy was instead of what she or he at present is. CBTs can address this qualification by giving understudies score reports endless supply of their test. The test can along these lines have moment affect. At the understudy level, this may include rapidly changing the instructional approach brought with a specific idea. At the school or locale level, prompt data may permit comparative however more worldwide strategic movements.

✓ Integrated information administration frameworks. Testing on computer can enable scores to be entered naturally into classroom-, school-, region , or statelevel databases. Once there, different individual and total reports can without much of a stretch be created to condense and track the execution of individual understudies and characterized gatherings.

✓ Diagnostic appraisal and combination with instructional programming. Self-delegating, prompt scoring, and simple information administration makes CBTs — versatile CBTs specifically — perfect for demonstrative or developmental appraisal. Consider the issue of evaluating an understudy's example of qualities and shortcomings over a genuinely wide substance space. A versatile CBT can start with a concise review of the space to decide the understudy's general level of capability. This is much the same as looking a dim stay with a moderately diminish, yet wide-shot electric lamp. The areas of huge articles can be mapped however subtle elements would not be unmistakable. Intriguing items are best inspected all the more intimately with a brighter, all the more barely engaged shaft. Certain versatile CBTs could be particularly intended to switch persistently between these parts and therefore would be extraordinarily suited for this sort of inquiry.

A further advantage on the diagnostic front is the ability to connect the scores output from a CBT directly to instructional software. This can allow the diagnosis remediation cycle to proceed much more quickly and easily than might be possible with paper-based tests.

Adaptable planning: Since CBTs can act naturally delegated and self-scored, they can enable testing to happen when schools or potentially understudies think that its helpful instead of as indicated by some forced timetable.

Reach and speed: Despite the fact that CBTs are here and there given in settled destinations committed to test organization, they can hypothetically be conveyed anyplace and at whatever time a computer is accessible. It is likewise conceivable to get a CBT bundled and appropriated significantly quicker than a paper test can be designed, printed, boxed, and transported. This circumstance can enable tests to change quickly so as to stay aware of quick changing educational module or topic.

Problems of Computer Based Examination in Nigeria Educational Institutions

Bennett (2015) watched that actualizing computer exams requires a protected testing condition, one that keeps understudies from looking for answers by checking their computer hard drives, texting or messaging companions, or perusing the web. To Fagbola(2013), absence of institutionalized/brought together CBT improvement show alone undermines the accomplishment of the e-examination stage for continuous reception by and by. Fluck (2009) is of the sentiment that online appraisal may not be viable for assessing imagination, critical thinking capacity, basic considering, reflection, or true adapting; altogether the qualities of profound and successful learning. Different difficulties militating against the full selection of CBT in Nigeria and other creating nations are highlighted beneath:

Inadequate ICT infrastructure: including hardware, software and bandwidth accessibility. Obioma(2013) watched that a great part of the foundations for robotized examinations are either out of date or overstretched regarding limit, openness, unwavering quality and security. Once more, the nonappearance of web offices in our provincial territories requires understudies setting out long separations to urban focuses to approach web. Broadband infiltration should be optimized to lessen the cost of web transfer speed access in Nigeria.

Power supply: The test of whimsical power supply in Nigeria has opposed all endeavors by different governments. Sporadic and visit intruded on power supply in Nigeria is a perpetual issue influencing each part of the economy including training (Oye, 2011). Most rural communities are not connected to the national grid, the implication is that schools located there cannot undertake practical effectively. During JAMB's online UTME, cases of power failure interrupting the examination abound.

Students / candidates inadequate skills in ICT: Many school leavers in the country are not computerliterate. Even many teachers in the primary and secondary schools cannot boot a computer not to talk ofusing any application. With these 'analogue' teachers to impart ICT skills to students, definitely the students cannot be adequately equipped for CBT. And this anxiety explains why the resistance to JAMB's full use of CBT in 2015 UTME by students, parents and even teachers.Nigeria does not just need ICT foundation; it likewise did not have the human abilities and information to completely coordinate ICT into auxiliary school training (Ilesanmi&Lasisi, 2015).

Integrity of examination managers: Outside tertiary foundations ICT focuses, other CBT focuses in Nigeria are exclusive digital bistro. One of the key reasons progressed for moving from PPT to CBT is to control the wild instances of examination acts of neglect in the nation, the uprightness of these specialists in holding fast to the set down strategy for biometric information catching amid enlistment and check amid examination can't be ensured. Involvement in SSCE examination has demonstrated that the vast majority of the exclusive schools are for immaculate monetary increases prompting a wide range of examination acts of neglect. These exam "supernatural occurrence" focuses disorder might be exchanged to CBT focuses if critical measures are not taken. All levels of government as a team with corporate association through open private organization (PPP) ought to manufacture, prepare and keep up standard. CBT focuses no less than four in each of the 774 nearby government territories in the nation. This will encourage e-examination in the nation and guarantee decency and value to the examinees.

Acceptability: There are arrangements of reasons distinctive partners are kicking against robotization of examination in Nigeria. Dreher(2011) referred to in Obioma (2013) watched that for instructors and teachers, work parts and control are significant explanations behind opposing computerized evaluation. They contended that since computerized appraisals are probably going to encourage a more autonomous way to deal with learning for understudies, instructors who consider themselves to be "master that interpret information in the classroom" are tested and thusly oppose its take-up in their classroom rehearses. For school proprietors and other instruction administrations suppliers, financial variable might be the purpose behind opposing the take-up of CBT. Ilesanmi and Lasisi (2015) noticed that ICT has remained a low money related need in most instructive frameworks in Africa. To preserve subsidize that would be utilized to get computers, web offices and other required framework, some school proprietors might need to sidestep the positive change CBT has conveyed to our instructive framework. For applicants and understudies, poor ICT abilities could be the main certifiable purpose behind not grasping CBT in this time.

Software factors: Presently, there is no product or mixed media that has all inclusive application to the extent CBT is concerned. School educational modules and training standard vary from one nation to the next. Fluck (2009) watched that evaluation of understudy learning and aptitudes inside a web program window or conveyed by bespoke appraisal programming (particularly created for a specific arrangement of inquiries) gives a confined situation which keeps the showing of capacities related with the utilization of master programming or a blend of uses. Once more, a degenerate programming or system disappointment can bring about rescheduling of the examinations.

Conclusion

The impact of computer based examination in Nigeria tertiary institutions in this present technological development era has enhanced both the teaching and learning process, and makes it easy for the achievement of teachers' set objectives. Teaching is no longer teachers' centered as the learner can utilize ICT tools like Computer Assisted Instruction for individualized learning. Despite the impact of computer based examination in Nigeria tertiary institutions, most institutions in Nigeria are yet to extensively embrace these innovations. Efforts should be geared integrating computer based examinations in Nigeria tertiary institutions. Problems such as inadequate ICT infrastructure, power supply, students / candidates' inadequate skills in ICT, integrity of examination managers, acceptability, software factors militates against these efforts. For computer based examinations to succeed in Nigeria, governments, school ownerships and individuals are called upon to look into the problems stated in this paper and proffer solutions to them, as such will go a long way to making teaching and learning more interesting, stimulating, admiring and efficient as well as to improve Nigeria standard of education through the proper use of ICT tools for computer based examinations.

Recommendations

In order to ensure that Computer Based Examinations are widely utilized in Nigeria tertiary institutions, the following recommendations are put forward:

1. Government should provide ICT facilities in all tertiary institutions in Nigeria.
2. Government should provide institutions at all levels in country with adequate information technology tools.
3. Teacher should be more committed with the use of ICT tools, giving the importance of practical knowledge in it.
4. Government should ensure adequate electricity supply in all tertiary institutions in Nigeria.
5. Adequate funds should made available for the provisions of ICT tools in Nigeria tertiary institutions.
6. Teachers and students should make use of ICT facilities in Nigerian tertiary institutions.

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INFLUENCE OF SECONDARY SCHOOL TEACHERS' TEACHING EXPERIENCE ON THE UTILIZATION OF ELECTRONIC MEDIA FOR TEACHING IN ILORIN METROPOLIS

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ABSTRACT

Electronic media are diverse set of electronic technologies, technological tools and resources used to communicate, create, disseminate, store and manage information. The study was based on Influence of Secondary School Teachers' Teaching Experience on the utilization of electronic media for teaching in Ilorin Metropolis. The study examined the types of electronic media available and used for teaching. A number of three hundred teachers were randomly selected from twenty schools with fifteen respondents (15) from each sampled senior and junior secondary schools in the selected three local governments in Ilorin metropolis. At the end of the survey, a total of two hundred and fifty-four (254) teachers adequately responded and submitted that was used for the study. Two research questions were answered and one hypothesis were tested. Means scores and percentage were used to answer the two research questions while t-test was used to test the hypothesis. The findings of the study showed that seven (7) of the electronic media were not available in school among the twenty-two (22) listed electronic media, other electronic media were available. Fourteen were used while the remaining eight were not used by the teachers. It was reported that there was not significant difference in teachers' utilization of electronic media based on experience with the t-test value of t(252) = -1.438, P>0.05. Based on this study, conclusions and recommendations were raised.

Keywords: Influence, Teaching Experience, Teaching, Electronic Media, Ilorin Metropolis.

Introduction

Throughout the globe, many nations have introduced various electronic media facilities into schools through different ways. The utilization of electronic media facilities has become a necessity for improving quality teaching and learning. This has been approved in Nigeria by the Federal Ministry of Education (FRN, 2010), when it was emphasized that electronic media is of crucial to the Nigeria educations at all levels. The successful integration of electronic media in teaching will immensely contributes to the success of both the teachers and the learners within and outside the classroom settings. The impacts of electronic media in classroom instructions is also attested to by the United Nation's Education, Scientific and Cultural Organization (UNESCO), at their National Summit on media in Germany in 1982. Their submission stated that on increasing number of people spend time watching television, playing records, and listening to the radio as these medium will appeal to both their sense of seeing and hearing (UNESCO, 2013).

Hepburn (2005), examines electronic media as media that use electronics or electrochemical energy for the end-user to access the content. In another way round, electronic media are diverse set of electronic technologies, technological tools and resources used to communicate, create, disseminate, store and manage information. These technologies may include materials such as computers, the internet, broadcasting technologies, instructional technologies and telephony. Many researchers have written on the impact of utilizing electronic media in the teaching and learning process. These researchers include (Aguokogbuo 2000, Koet2000, Nwanna-Nzewunwa 2003, & Omoyajowo, 2014).

Omoyajowo (2014) submitted that electronic media re those electronic devices or electronic technologies that facilitates transmission of information. These include telephones, radio, television, satellites, and computers and so on. The researcher also emphasized that electronic media are utilized to determine volume of data within a short period of time. Alexander (2011) noted that electronic media are electronic technologies which are utilized for collecting, storing, and processing of information. In addition to the researcher's submissions, the use of electronic media in the teaching and learning has become one of the most vital facilities that can be utilized to preferring solutions to teaching and learning challenges.

Teachers are expected to interact fully with their environments to bring about desirability, effectiveness and efficiency in instruction centered on learners. These responsibilities cannot be handled with mere talk-chalk approach. There is need for the application or utilization of electronic media to enhance the achievement of all the domains of education with maximum ease. (Onasanya 2004, cited by Omoyajowo, 2014). Guernsey (2010), found out that, using electronic media in teaching stimulates the development of intellectual skills, contributes to the ways of acquiring knowledge, skills and attitude, makes learners using media in instruction concentrate more than students in traditional setting, gingers the spirit of research within students and provides collaborative learning.

Relevant to this research is teaching. Abimbola (2004), defined teaching as a process that facilitates students' learning through proper management by teachers. These includes interrelationship among the students' interest, the content for learning, and the methods with materials they intend to utilize in the teaching and learning process. Teachers teaching experience contributes significantly to the successful utilization of electronic media in the teaching and learning. Scholars observed the significant contributions of electronic media in the process of instruction; these include(Cubbons& fair Weather, 1997, Lawal 2004, Betts, Zau, & Rice 2003, Omoyajowo, 2014).

Also, Akubuilo, (2005) noted that years of teaching experience play a significant role in teachers' productivities. Onanuga (2006) asserted that the more the number of years spent on the profession reduces most teachers' productivity in all aspects. Teachers teaching experience in electronic media utilization is essential because this will go a long way in proffering solutions to teaching and learning problems. It is in the light of this, that the researcher carried out teachers' teaching experience on the utilization of electronic media for teaching in Ilorin metropolis.

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Influence of Secondary School Teachers' Teaching Experience on the Utilization of Electronic Media for Teaching in Ilorin Metropolis

Purpose of the Study

The general purpose of this study was to examine the influence of teachers' teaching experience on the utilization of selected electronic media for teaching in Ilorin metropolis. Specifically, the study examined the following purposes:

1. The extent of electronic media that was available for teaching in Ilorin metropolis.
2. The extent of teachers' utilization of electronic media for teaching in Ilorin metropolis.
3. If there is any significant difference in the extent to which electronic media are used by experienced and less experience teachers in Ilorin metropolis.

Research Questions

1. What are the types of electronic media available for teaching in Ilorin metropolis?
2. To what extent do teachers utilize the available electronic media in teaching in Ilorin metropolis?
3. Is there any significant difference in the extent to which electronic media are utilized by experienced and less experienced teachers in Ilorin metropolis?

Research Hypothesis

Based on the research questions, the study tested these hypotheses:

H_{01}: There is no significant difference in the utilization of electronic media by experienced and less experienced teachers in Ilorin metropolis.

Methodology

This study was a descriptive survey method that investigated Influence of Secondary School Teachers' teaching experience on the Utilization of Electronic Media for Teaching in Ilorin Metropolis. The population for the study consisted of all secondary school teachers in Ilorin metropolis while the target populated for this study was all junior and senior secondary school teachers in Ilorin East and West. A total of 300 teachers, were randomly selected from twenty(20) schools with fifteen(15) respondents from each sampled junior and senior secondary schools in both Ilorin West, Ilorin South and Ilorin East. Purposive sampling techniques was used to select ten (10) senior and junior secondary schools from the three selected local governments in Ilorin metropolis. At the end of the survey, a total of 254 teachers responded and submitted the questionnaire that was used for the study. A researcher-designed questionnaire titled "Influence of Secondary School Teachers' Teaching Experience on the Utilization of Electronic Media for Teaching in Ilorin Metropolis" was used to determine the extent of utilization and availability of electronic media in Ilorin metropolis. The instrument was validated by experts to check the clarity of language and ensure it is relevant to the study. Their corrections and suggestions was noted and used for the final draft of the instrument. The instrument was pilot tested on twenty (20) teachers who were not originally part of the sample used for the study to determine the reliability. The twenty questionnaires had reliability of 0.95 therefore, the instrument is reliable for the study.

Data Analysis and Result

The three major research questions analysis using percentage and meanwhile the hypothesis was tested using t-test.

Research Question 1: What are the types of Electronic Media available for teaching in Ilorin metropolis?

Table 1: Percentage ratings of the responses of teachers on the availability of electronic media for teaching.

S/N	Electronic Media	Available (%)	Not Available (%)	Decision
1.	Overhead Projector	35.9	60.5	Not Available
2.	Radio Sets	64.6	35.4	Available
3.	Television sets	70.5	29.5	Available
4.	Tape Recorder Players	61.8	38.2	Available
5.	Video Players	55.9	44.1	Available
6.	Still Cameras	22.0	78.5	Available
7.	Motion Cameras	29.5	70.5	Not Available
8.	Computers	73.7	26.3	Not Available
9.	Internet Connectivity	36.3	69.7	Available
10.	Audio Tape Recorders	54.3	45.7	Not Available
11.	Video Tape Recorders	24.0	76.0	Available
12.	Flash Drive	60.2	39.8	Not Available
13.	Telephone	72.4	27.6	Available
14.	Public Address System	66.9	33.1	Available
15.	Multimedia Projector	55.9	44.1	Available
16.	Radio Broadcast	22.0	78.0	Not Available
17.	Television Broadcast	27.6	72.4	Not Available
18.	Memory Card	72.4	27.6	Available
19.	Films	70.9	29.1	Available
20.	Video Cassette (tapes)	55.9	44.1	Available
21.	Presentation Software e.g. PowerPoint	73.1	26.9	Available
22.	Computer Disc	55.9	44.1	Available

The table 1 above revealed that amongst the twenty-two (22) electronic media selected in this study, as required by teacher for effective teaching to students, only seven (7) electronic media were considered not to be available in the selected schools and the unavailable electronic media are overhead projector, still camera, motion camera, internet connectivity, radio tape recorder, radio broadcast and television. This is because the percentage of availability of the electronic media was less than 50% below 50% which is the cut-off point. The percentages of the 15 available electronic media are 50% or above which were above the cut-off point. This indicated that those above 50% were on the average.

Research Question 2: To what extent do teachers use the available electronic media in teaching in Ilorin metropolis.

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Table 2: Percentage rating on the responses of teachers on the use of available electronic media for teaching.

S/N	Electronic Media	Not Used (%)	Seldon used (%)	Frequently used (%)	Decision
1.	Overhead Projector	65.4	2.4	32.2	Not Used
2.	Radio Sets	1.6	1.2	97.2	Used
3.	Television sets	0.8	1.2	98.0	Used
4.	Tape Recorder Players	65.0	1.2	33.9	Not Used
5.	Video Players	18.9	0	81.1	Used
6.	Still Cameras	85.8	0	14.2	Not Used
7.	Motion Cameras	73.2	5.5	21.3	Not Used
8.	Computers	38.6	0	61.4	Used
9.	Internet Connectivity	85.8	0	14.2	Not Used
10.	Audio Tape Recorders	48.0	0	58.0	Used
11.	Video Tape Recorders	56.3	4.3	39.4	Not Used
12.	Flash Drive	28.3	0	71.7	Used
13.	Telephone	33.1	0	66.9	Used
14.	Public Address System	38.6	0	61.4	Used
15.	Multimedia Projector	27.8	7.9	69.3	Used
16.	Radio Broadcast	61.4	14.6	24.0	Not Used
17.	Television Broadcast	44.9	16.1	39.0	Not Used
18.	Memory Card	12.6	18.1	69.3	Used
19.	Films	20.9	29.1	50.0	Used
20.	Video Cassette (tapes)	28.6	16.9	44.5	Used
21.	Presentation Software e.g. PowerPoint	35.4	43.3	21.3	Used
22.	Computer Disc	35.4	37.0	27.6	Used

Table 2 revealed that 14 out of 22 electronic media listed in the study to be required by teachers for effective teaching to students in schools are used. This is because the percentage use of electronic media was 50% or above which were above the cut-off point. The remaining 8 electronic which are also not available in the schools had their percentage use below 50% which is the cutoff point. This indicated that they were not used on the average and they are overhead projector, still camera, motion camera, internet connectivity, tape recorder players, video tape recorder, radio broadcast and television broadcast. This indicated that most of the electronic media that are not often available are not often used by the teachers for effective teaching in schools. The table also reveal that 8 out of 22 electronic media that are not available are the ones not used by the teachers. This indicated that the electronic media were not available in schools.

Research Hypothesis: There is no significant different in the use of electronic media by experienced and less experienced teachers in Ilorin metropolis.

Table 3:
Differences in the use of electronic media by experienced and less experienced teachers.

Qualification	N	X	SD	df	t	Sig	Remarks
Experience	121	50.36	5.02				
				252	-1.438	0.115	Accepted
Female	106		50.72	4.30			

Significant @ 0.05

the t-test value of t(252) = -1.438, P>0.05 indicated no significant difference. This indicates that no significant difference exists between experienced and less experienced teachers used of electronic media for teaching. Therefore, the hypothesis which states that there is no significant difference in the use of electronic media by experienced and less experienced teachers in Ilorin metropolis is accepted. This implies that no differences existed among teachers in the use of electronic media based on experience.

Summary of Findings
The findings of this study are therefore summarized as follows:
1. Based on the findings of the study, 7 out of the 22-electronic media were not available in schools. The available 15 electronic media rated 50% and above.
2. The study also revealed that 14 out of the required 22-electronic media established for effective teaching in schools are in use.
3. There was no significant difference in the utilization of electronic media by experienced and less-experienced teachers.

Conclusion
The conclusion drawn from the result obtained from this study is that electronic media are available for teachers to use for teaching. Another major conclusion from this study is that teachers teaching experience revealed no significant difference was found in the utilization of electronic media by experienced and less experienced teachers.

Recommendations
Based on the finding of this study the following recommendations are put forward:
1. Since electronic media is an essential facility in the teaching and learning, policy makers should involve not only training teachers but also retraining and constantly updating their skills to enable them to keep pace with usable electronic media.
2. Adequate funds should be made available for the provisions of electronic media in schools.

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ONLINE DISTANCE LEARNING ADOPTION: CASES OF FINLAND AND NIGERIA

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Abstract

Globalisation, general internet technologies and knowledge acquisition have now become the basis for competition even amongst states. Knowledge acquisition and application, in turn, is a crucial element of learning. As an option, infusing online distance learning as a mode of anchoring academic programmes offers by the universities could serve as leverage to become self-reliant. The main study objective is to explore the factors affecting the adoption of online distance learning in Finland and Nigeria exploring the two distinct population of developed and developing countries. This research is based on a quantitative approach using a questionnaire to collect data in two countries respectively. Since online distance learning is peculiar to the students in tertiary institutions, students at the University of Applied Sciences, conventional Universities in Finland and Nigerian higher institutions characterise the respondents of this study and workers in different sectors. The study expanded UTAUT with compatibility for lifestyle and self-efficiency constructs. The study tested the hypotheses and built a structural model for validity using SmartPLS software. The path coefficients were produced using bootstrapping model. The result of the study reveals enablers of ODL adoption by universities and higher institutions in Finland and Nigeria. In both countries, compatibility for lifestyle has a positive impact on effort expectancy to adopt online distance learning and facilitating conditions has a positive broadened UTAUT for studying factors affecting behavioural intention to use online distance learning in Finland and Nigeria. The study also gives future direction.

Keywords: *Online Distance Learning (ODL), Unified Theory of Acceptance and Use of Technology (UTAUT), Compatibility for Life Style (CFL), Efficiency (EF)*

Introduction

With the globalisation, general internet technologies and knowledge acquisition have now become the basis for competition even amongst states. Knowledge acquisition and application, in turn, is a crucial element of learning. Through the internet and other information technologies such as multimedia, learning has become easier and more convenient (Tung and Chang 2008, 1300; Tung and Chang 2008, 294; Lee 2007, 1423). The acceptability and popularity of online distance education have been on the increase; owing to incredible opportunities it provides for education and training delivery (cf. Lee 2007, 1423). The popularity stems from the inherent flexibility and time savings it provides. Recently, the explosion of online distance learning according to Boling, Hough, Krinsky, Saleem and Stevens (2012, 118) is due to "shrinking budgets and lower local students' enrollment at the universities." Perhaps, it is the same reason that is driving the like of Coursera and other platforms being put together by an amalgam of partners' universities in some part of the world. Within five years since 2012 Coursera has recorded 25 million learners, 149 University Partners, 2000 courses, 180 specialisations courses and 4 degrees online distance learning program. In a similar vein, adopting online distance learning in Finland is also predicated on the factors mentioned above. The budget to higher institutions in Finland is shrinking, even as the ministry of education changed its free education policy and introduced tuition fee to non-EU students. Regarding this development in Finland, Universities are now coming up with innovative ideas on how to be self-reliant and less dependent on shrinking budget from the Government.

As an option, infusing online distance learning as a mode of anchoring some programmes offers by the universities could serve as leverage to become self-reliant. Currently, some universities offer online distance courses as part of their programmes. The popular programme is online distance learning MBA tailored towards the working-class people. This MBA programme is a mixed study of 50-50, 60-40 or 70-30 of online and offline courses. On the part of the open university in Finland, it offers courses for busy people. However, none is yet to provide online distance learning as the only mode of teaching for any programme yet. This study thus seeks to explore the opportunities and readiness of the population to adopt online distance learning as a complete offering for a programme of studies at the Finnish universities and Nigerian higher institutions. ODL would be a whole new experience if implemented in Finland and Nigeria. Besides, in the event of implementation of tuition fee, online distance learning would become handy for those who must work to raise the necessary fund to finance their education. Given this, the study proposed a research question: what are the factors affecting the adoption of online distance learning in Finland and Nigeria?

Online Distance Learning

Recent studies according to Tung and Chang (2008, 1300) have found that online courses are quite helpful for students. Some other studies have looked at online distance learning from the perspective of the relationship between instruction materials and the structure of the materials, teaching strategies, the abilities of learners, the self-control and behaviour of students (Lee 2007, 1424). One of the major merits of online distance learning is that it overcomes some drawbacks inherent in traditional classroom setting.

The traditional classroom teaching lacks flexibility and not too resource efficient; whereas online distance learning is not only flexible but also resource efficient, even in the context of time and space (Tung and Chang 2008, 294.) Online distance learning via the Internet platform can provide universities with a low-cost, flexible option to expand even into global markets (Boling et al. 2012, 119). Despite the seeming advantages in online distance learning, the need to ascertain the necessary precondition that will facilitate the adoption of online distance education cannot be over emphasised.

Finland is extremely advanced in technology, so incorporating a variety of media and communications tools is a natural way to provide students with meaningful learning activities and practice opportunities, especially off campus (Dahlman and Rilling, 2001). Wende and Beerkens, (1999), DfEE, (2001), Finnish Information Technology Development Centre, (2001), Parjanen and Tuomi, (2003) regarded the country as an innovative country in open/distance learning. The increase in internet use has revolutionize open/distance learning as its mostly now predicated based on using a computer (Pohjonen, 1997).

In Scandinavia, there is an almost universal provision of open/distance learning across the higher education sector as Van de Wende and Beerkens (1999) noted that 100% of Swedish universities are engaged in open/distance learning and that anecdotal evidence suggests that the figure for Finland is likely to be closer to that for Sweden.

As pointed out by van de Wende and Beerkens (1999) that the distinction between campus education and distance education is becoming blurred. Presently in Finland, there is increased open/distance learning as in other OECD countries. They use 'pick-and-mix' or 'blended' approach as they use elements of open/distance learning in their traditional, campus based undergraduate and postgraduate courses. They have single subject online distance learning (ODL) successfully in Finland but not a complete degree or masters ODL.

In 2002, the Nigerian educational system witnessed a change with the reopening of the National Open University of Nigeria (NOUN), which was closed 18 years earlier due to political upheavals in the country provided credence and the level of awareness needed for the acceptance of distance education in Nigeria. However, National Teachers' Institute (NTI) and other conventional institutions have been in existence offering distance learning courses such as Ahmadu Bello University, Zaria; Distance Learning Institute at the University of Lagos; Centre for Distance Learning at the University of Ibadan; and the Distance Learning and Continuing Education Centre at the University of Abuja (Aderinoye and Ojokheta, 2004). *Ojo, Ogidan and Olakulehin, (2006)* concluded that open and distance learning institutions are highly effective and that many recipients confirmed that more of these types of institutions are needed. According to Ojo and Olakulehin (2006), recognition of a conventional university education value was never in doubt, people nonetheless had purposefully chosen to enrol in an open and distance learning institution as students held positive perceptions and attitudes towards it. Summarily, what operates presently in Nigerian educational system is open and distance learning with mere infusion of online distance learning mode to anchor some programmes offered by the universities. They offer online distance courses as part of a programme for working or non-working class people but none is yet to offer online distance learning as only mode of teaching for any programme.

Online courses and virtual universities in the world witnessed steady growth in number with the advent of internet thereby redefining the concept of distance education. In Nigeria situation, there is concern of accessibility to the internet due to its high cost, epileptic services and in most rural communities, unavailable broadband internet services while some students who reside in the rural areas must travel down to the urban centres in order to have access to the internet for their assignments (Osang, 2012). The author further stressed that most students' access internet through cyber cafes' while very few students' access it from their homes or offices and very few students can conveniently afford internet MODEMs which are still expensive. As at the end of march according to Internet World Stats, (2017), the number of internet users in Nigeria is 93,591,174 which amounts to 48.8% of its population penetration and the highest internet user in Africa. Judging with these statistics, online distance learning can be possible in Nigeria.

Conceptual Model and Hypothesis Development

The Unified Theory of Acceptance and Use of Technology (UTAUT) was formulated by Venkatesh et al. (2003) to measure, predict and explain user intentions to use an information system and subsequent usage behavior. According to *Attuquayefio and Addo (2014)*, the authors of UTAUT model unified eight theories and models which include Theory of reason Action (TRA) (Fishbein and Ajzen 1975), Technology acceptance model (TAM) (Davis 1989), Motivational model (MM) Davis et al., (1992), Theory of planned behavior (TPB) Ajzen (1991), combined TAM and TPB (C-TAM-TPB) Taylor and Todd (1995), Model of PC Utilization (MPCU) Thompson et al. (1991), Innovation Diffusion Theory (IDT) Rogers (1995) and Social Cognitive Theory (SCT) Bandura (1986). The authors stressed that all the constructs from the eight models were summed up to the four determinants which predicts intentions and usage and four moderators of the key relationships Venkatesh et al. (2003) in the model.

The Unified Theory of Acceptance and Use of Technology (UTAUT) have been widely applied in relevant information technology (IT) and information systems (IS) research. The unified theory of acceptance and use of technology (UTAUT) was presented by Venkatesh et al in 2003. The theory has its background in several other theories, which have been combined to produce a more complete model of user behaviour (Venkatesh et al 2003).

The theory seems to provide better explanation for about 70% of observed variances in studies on IT adoption and more so included demographic factors such age and gender ignored in other models like TAM (Venkatesh et al 2003). UTAUT model has four exogenous variables (Performance Expectancy which equals perceived usefulness of TAM, Effort Expectancy (EE) which equals perceived ease of use of TAM, Social Influence, and Facilitating Conditions), two endogenous variables (behavioral intention and actual usage) and four moderating variables (gender, age, experience and voluntariness of use). This study however, expanded the independent variables by including additional two of: Compatibility for Lifestyle (CF), Self-Efficiency (EF), while only BI is the independent variable used and with no moderating factors. Hence, a new hybrid UTAUT was developed for studying factors affecting behavioral intention to use online distance learning in Finland and Nigeria.

Compatibility for Lifestyle

Compatibility for Lifestyle (CF): The degree of combination of factors which determines how the students synergized with learning environment psychologically and interact and response to accordingly (cf. Dad and Gecer 2009, 862). Since it is possible for compatibility for lifestyle to affect ODL adoption, the authors hypothesize that:
H1: Compatibility for lifestyle has a positive influence on effort expectancy to adopt ODL.
H2: Compatibility for lifestyle will positively affect social influence on ODL adoption

Effort Expectancy

Effort Expectancy (EE): This equals perceived ease of use in Technology Acceptance Model (TAM). According to Venkatesh et al. (2003, p.450), it is the degree of ease associated with the use of the system. The perception of ease involved in engaging with ODL will determine its adoption, the authors hypothesize thus:
H3: Effort expectancy has a positive influence on behavioral intention to adopt ODL.

Self-Efficiency

Self-Efficiency (EF): Though somewhat like 'self-efficacy' that is commonly used in most studies, however, self-efficiency is used in this study and is define as an individual's perceptions of his or her ability to use resources (both computer and otherwise) necessary in the accomplishment of a task rather than reflecting simple component skills (cf. Compeau and Higgins 1995). We hypothesize thus;
H4: Efficiency has a positive influence on behavioral intention to adopt ODL

Facilitating Condition

Facilitating Condition: This is the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al. 2003, p. 453). Availability of computers, internet, power supply and other infrastructural facilities will contribute to the decision of ODL adoption. We therefore hypothesize that:
H5: Facilitating Conditions has a positive influence on behavioral intention to adopt ODL
H6: Facilitating Conditions will have positive influence on Compatibility for lifestyle in adopting ODL
H7: Facilitating Conditions will have positive influence on self-efficiency to adopt ODL.

Social Influence

Social Influence: This is known as the degree to which an individual perceives that important others believe he or she should use the new system (Venkatesh et al. 2003, p. 451). Individuals can be motivated to adopt ODL by the influence of opinion leader and family member. The authors hypothesize that:
H8: Social influence has a positive influence on behavioral intention to adopt ODL

Behavioural Intention

Behavioural intention is the degree of individuals willingness to use a system (Venkatesh et al. 2003). Warshaw and Davis (1985, p. 214) also define behavioral intention as the degree to which a person has formulated conscious plans to perform or not perform some specific future behaviour. Behavioral intention will be used as a dependent variable in this study to predict the ODL adoption.
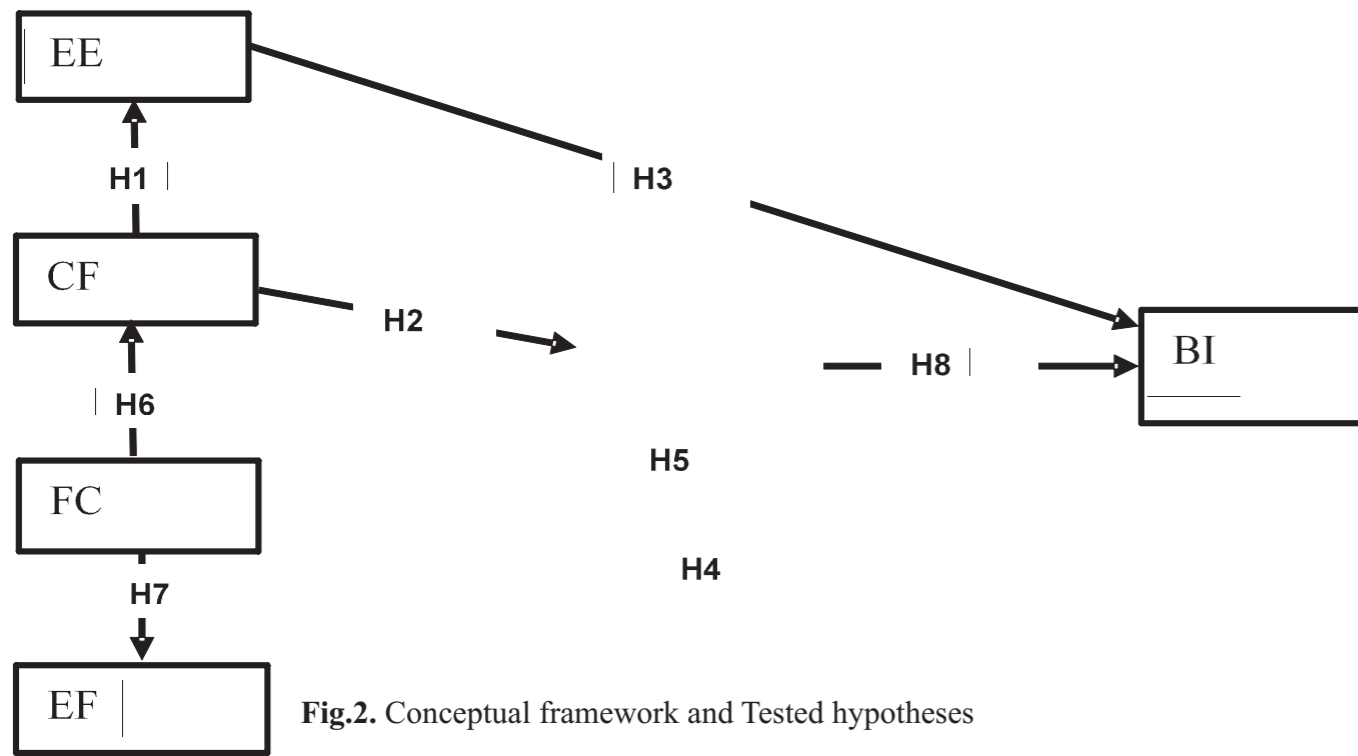
Fig.2. Conceptual framework and Tested hypotheses

Methodology

Data Collection

This research is based on a quantitative approach using questionnaire to collect data. Identical questionnaire was administered online and offline (hardcopy) to the respondents in Finland and Nigeria respectively. The online survey was through Survey Monkey platform (www.surveymonkey.com) and offline was a paper distributed to respondents. Online survey was employed in one of the countries because of the respondents' high and reliable accessibility to internet connection. The questionnaire in both context is divided into two main sections: background information and 11 constructs with 3 questions each. The background information contains general questions about the respondents' sex, age, occupation, academic attainment, salary and computer experience. The second section contains 33 questions to measure the factors affecting the adoption of online distance learning. Since online distance learning is peculiar to the students in tertiary institutions, students in the University of Applied Sciences, conventional Universities in Finland and Nigerian higher institutions characterize the respondents of this study and workers in different sectors.

Population and Sample

In Finland, a total of 160 questionnaires were returned of which 125 is useable for this research due to the inconsistency of 35 respondents missing data. The response rate was 78.1%. This response rate is a bit high when compared with other studies results that are below 50%. Students and workers constituted the population for the study while the study aimed at evaluating the factors affecting adoption of online distance learning in Finland. The respondents consisted of 100 males and 25 females between age bracket 17 and 49 years old. Among the respondents 62.4% are doing their bachelors programmes while 22.4% are doing their masters programmes. 64.8% of the respondents have completed an online course while 35.2% respondents did not have any experience of online course. This indicates that greater percentage of the respondents had already known what online distance learning is before the survey while the minorities are still ignorant of online distance learning.

In Nigeria, a total of 162 questionnaires were retrieved while 124 of the survey is used because of unengaged responses during the cleaning process. The students and workers were the sampled respondents involving 73 males and 51 females within the range of 17 and 49 years old age bracket. 59.3% of the students are undergraduate and 30.0% are graduates.

Measurement Items

The items used in the questionnaire were extracted from the previous studies. Six constructs were measured based on five-point Likert-scales varying from (1) disagree, (2) partially disagree, (3) I don't know, (4) partially agree and (5) agree. The measure for performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC) and behavioural intention (BI) were adapted from model developed by Vankentesh (2003).

Compatibility for life style and efficiency were added to the existing instrument developed by Vankentesh to make it more robust. There were some modifications and reconstruction of the survey instrument to tailor it to the present study. SPSS 21.0 was used for descriptive statistics and SmartPLS 2.0 was used to test the hypotheses and measure the validity of the constructs.

FINDINGS

To test the hypotheses, a structural model was built using SmartPLS software. The path coefficients were produced using bootstrapping model. In the bootstrapping procedure, behavioural intention, compatibility for lifestyle, effort expectancy, efficiency, facilitating condition, performance expectancy, social influence were the exogenous variables which, had direct effects on other variables in different level of effects and were statistically significant in all ramifications.
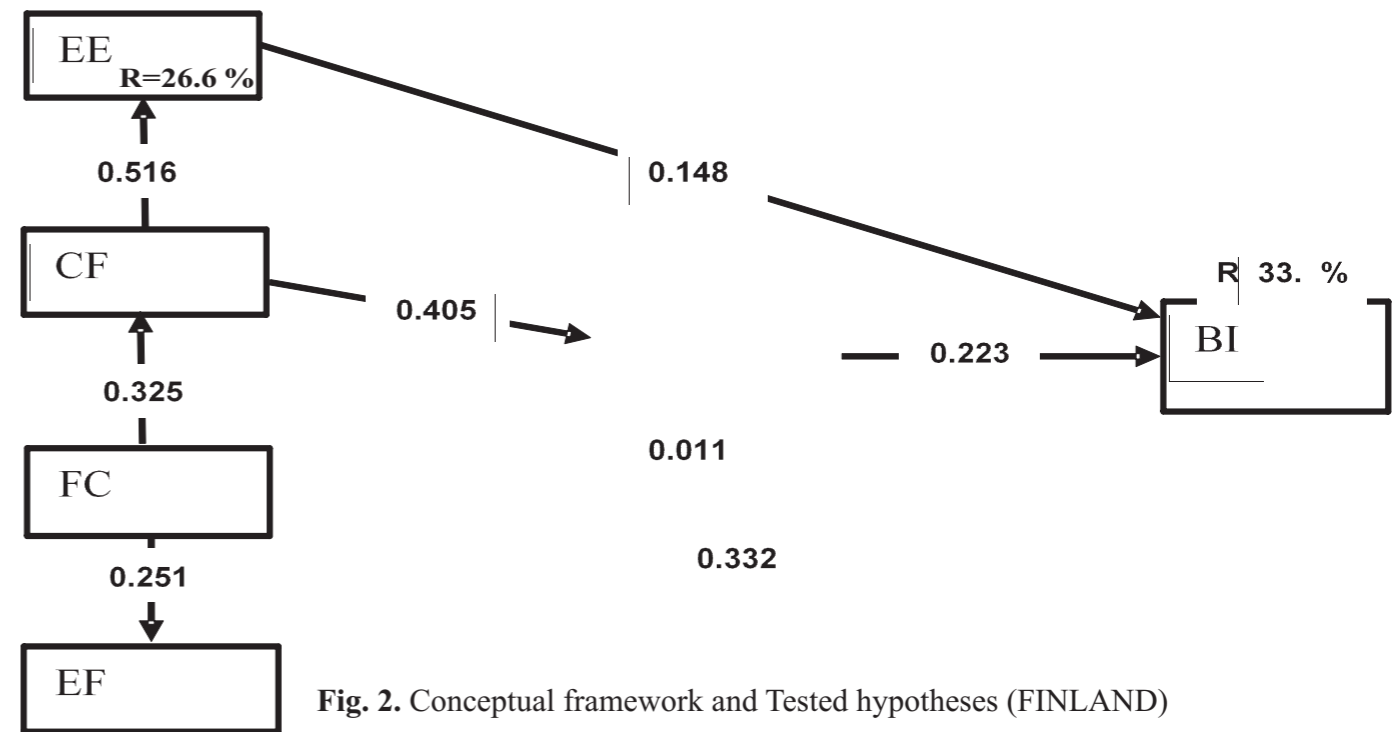

Fig. 2. Conceptual framework and Tested hypotheses (FINLAND)

Table 1 FINLAND
Standardized path coefficients and corresponding hypothesis results

Hypothesis	Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)	Hypothesis Confirmed
H1	" "	0.5159	0.5191	0.063	0.063	8.1832	Yes
H2	CF	0.4047	0.411	0.0608	0.0608	6.6544	Yes
H3	EE	0.1482	0.1515	0.1002	0.1002	1.4794	No
H4	EF	0.332	0.3269	0.1077	0.1077	3.0825	Yes
H5	FC	0.0113	0.0181	0.0661	0.0661	0.1707	No
H6	FC	0.325	0.3367	0.0977	0.0977	3.3277	Yes
H7	FC	0.2511	0.263	0.1034	0.1034	2.4288	Yes
H8	SI	0.2233	0.2252	0.0818	0.0818	2.7306	Yes

Student can take different courses online through the Open University and transfer the credits for undergraduate or postgraduate programmes in Finland. There are single online courses via Moodle or through other online platforms, but there is no full online distance programme. Also, Nigeria offer distance learning courses in conventional universities and open university infusing online platforms with occasional on-campus attendance but not as advanced the developed country to transfer credits as part of the fulfilment of the degree requirement. In all, none of the countries is yet to provide online distance learning as the only mode of teaching for any programme yet in Finland and Nigeria. Education platform that can enhance student career, that is compatible with their lifestyle and make them efficient in their studies should be the focus of Nigeria and Finland education policy maker. The student needs much orientation, publicity and motivation for adoption of online distance learning in both contexts. The present study contributed to the education technology literature. The paper presents the conception of compatibility for lifestyle and efficiency as it associates with an adoption of online distance learning. Traditional UTAUT constructs, including effort expectancy, social influence and facilitating condition, were not found as robust as they were in previous UTAUT studies. Particularly, effort expectancy is not the most dominant motivator in comparison with compatibility for lifestyle. The results suggested that compatibility for lifestyle is an important factor to be considered for adoption of online distance learning.

Limitations and Future Research

Among the limitations of this study that is worthy of consideration is an inability to include the actual usage in the study. Also, the male respondents took part in the survey more than the female respondents, and this may well represent the male group. It will be better if the future studies can investigate ODL adoption based on age group, experience and education level.

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