

EMERGING TECHNOLOGIES AND VIDEO MEDIATED INSTRUCTIONAL STRATEGIES IN CONTEMPORARY EDUCATIONAL SYSTEM IN NIGERIA

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Abstract

This paper examined emerging technologies and video mediated instructional strategies in contemporary educational system in Nigeria. It discussed the historical development of video mediated instruction as an offshoot of the technological growth of the 21st century. This paper was tailored towards teaching and learning both in and outside the classroom. This technologies are for basic instruction, classroom enrichment, accelerated learning, distance education, global student collaboration, communication and professional development. Strategies for the application of videos in the classroom were also espoused and the benefits of using video mediated instruction was harnessed. Some of the challenges in the adoption of video-mediated instruction comprising of technological, legislative, behavioural pattern, and resource-based challenges. Recommendations were based on understanding of good practices that can help improve success in incorporating video mediated technologies in teaching and learning processes.

Key words: Technologies, instruction, education

Introduction

In the contemporary society, technological growth is taking over as a formative influence in teaching and learning processes. Technologies help to prepare students for the 21st century competition which involve skills and creativity. It creates cultural awareness, problem solving, innovation, communication, productivity, collaboration and exploration; with the ultimate aim of making the classroom a dynamic environment. With the emerging technologies in the society, this can improve learning, teaching, and reading skills of both teachers and students as well as in enhancing instructional supervision by the school administrators (Sinha, 2013).

The Internet, mobile devices and social networking platforms such as Facebook, Twitter and so on are technologies that have transformed the way teachers communicate, interact and transact with the global society. Video mediated instruction can help teachers traverse the boundaries of geography and time, making teachers active participants in other people's culture and environment. However, it is very challenging that teachers' effort especially in classroom where teachers and students don't seem to enjoy classroom activities due to ineffective technology as instructional resources (Gupta, 2017). The use of video in educational settings is applicable to teaching, studying and learning in and outside the classroom which cut across all disciplines for educational enhancement. Video instruction can be designed for presenting case studies, interviews, digital storytelling, student directed projects, and online evaluation (Zhang, Zhou, Briggs & Nunamaker, 2006).

Concept of Video Mediated Instruction

Alabi (2013) in Aboyegi (2014) defines video mediated instruction as an educational process that ensures that practical skills are taught using video. The video links the audio and the visual together to provide a multisensory experience for the learner for maximal understanding. Learners can play, replay, pause and rewind to specific section of the experiment and this aids practice and rehearsal which is so important in developing competency. Hence, the learner has control over the process of learning. Video instruction is one of the audio visual media that could be used to facilitate instruction.

Video instruction appeals to senses of hearing and sight. Recent advances in multimedia and communication technologies as reported by Aboyeji (2014) have resulted in powerful learning system with instructional video components. Video is rich and powerful medium used in learning. It can present information in attractive and consistent manner. However, the instructional video used in early studies was primarily either broadcasted TV programme or stored on CDs ROM, the linear nature of such video produced inconsistency results (Brecht, 2012). According to Aboyeji (2014) videotape instructional package would teach effectively in the large populated classroom successful and with students understanding the lesson better.

For instance a close circuit television could assist the teacher teach a large population of students subject effectively not necessarily Social studies, it is also believed that with the use of this package it will motivate the students the more in what they see and hear will remain permanent in them since the paper is also considering the students retention ability. Dale 1969 in Alabi (2012) , states that pictures are effective but not as effective as motion pictures, this study believed that youth of today love watching football than reading their books, in fact a number of them have allowed the television to become impediment to their studies, some could forget their lecture for watching football or their interesting programme. With the introduction of Television/Videotape frequently in Nigeria, it may be potent because it will attract the attention of students.

Video is an electronic medium for the recording, copying, playback, broadcasting, and display of moving visual object. Video mediated instruction can be carried on a variety of media, including radio broadcast, tapes, DVDs, computer files and so on (Illeris, 2014). Video mediated instruction is often attractive as a means to capture lecture content and present direct instruction to the learners. Of all the technological components involved in the learning experience, it is often believe that the most visible and resource intensive in the video mediated instruction (Brame, 2015).

Historical Development of Video Mediated Instruction

In years back, globalization, technology, and demographic shifts have dramatically redefined economic development, business, social environment and educational enterprise. The western society like the United States, European Union nations, and other players have contributed to web economic interdependence, while countries like Brazil, Russia, India, and China have emerged as significant nations in economy through technological expansion around the globe. The use of Television, and cable, have been an effective combination of video and audio distance education medium. Individuals or groups can receive video mediated and audio instruction at remote locations using the national network of Public Broadcasting Stations (PBS) or participating cable systems. Additionally, microwave transmission of video signals provides access to non-wired viewing sites and incorporating them into technological global awareness (Alabi, 2012).

Video as a change agent in the classroom has undergone a unique cycle of adoption over time (see Figure 1). Use of broadcast television and films first progressed as out-of-the-classroom forms into enrichment (assignments to supplement class work) before it become an instrument for classroom instruction.

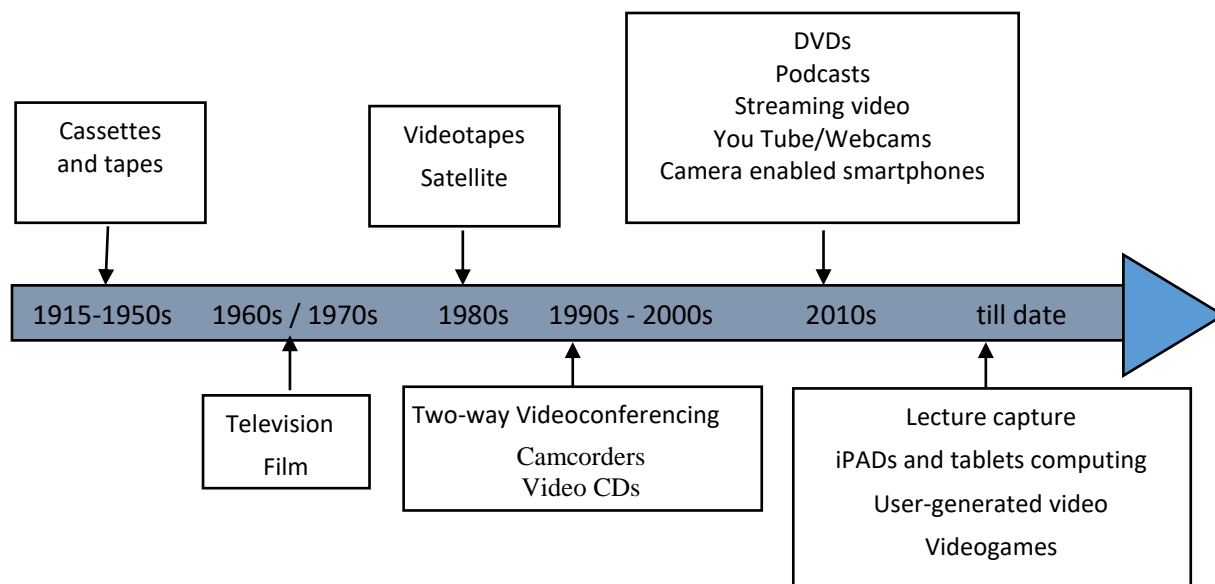


Figure 1: General Timeline for visual technologies in the classroom.

Source: Greenberg and Zanetis (2012:11)

In the past 55 years, there has been a shift in viewers' behaviour due to the availability of video mediated instruction. Viewers have moved away from being passive spectators absorbing the images and content displayed on the screen to participate in the ongoing instruction. According to reactive theory of viewing, Winn, 1977 in Vikoo (2015) viewers have become active observers and participate by become active observers, applying individual experiences and understanding of their viewing content. According to cognitive active theory of Anderson, 1983 as cited in Greenberg and Zanetis (2012) observe several new forms of video came along: Laserdiscs and videotape were popular methods of enriching the classroom with content in every subject matter. Additionally, satellite delivery, which had already been available became a more common method of delivering instruction in the distance education networks.

Camcorders made it possible for teachers and students to begin to create their own analogue content, although the means for distributing the 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 to some universities in the past. In the first decade of the 21st century, the connection with classrooms to the Internet was so significant to permit the distribution of digital content globally. Within a few short year, 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 to spice up technological knowledge. Podcasts had brought the ability to create and deliver discrete audio files for educational purposes and enhanced classroom delivery. 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 have enabled video to be delivered to 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 answers the need for flexibility in time and location of presentation. Video cassette playback units are required equipment if the learner is to take instruction in this medium. Video discs provides a new packaging for video/audio instruction. Video discs, like their music equivalents, compact discs, are easy to use and are very durable. Video disc technology also provides more opportunity, using custom programs by teachers, to create high interactive instruction that suit the learner.

Types of Video Mediated Instruction

Video conferencing Video Mediated Instruction

Video conferencing or video communications is the ability to communicate with other people as if they were in the same room. For video conferencing to really succeed, participants need to be able to see, hear and use meeting tools regardless of whether participants are in the same room or across the other side of the world. Video conferencing is defined as (by www.whatis.com): “a live connection between people in separate locations for the purpose of communication, usually involving audio and often text as well as video. At its simplest, videoconferencing provides transmission of static images and text between two locations. At its most sophisticated, it provides transmission of full motion video images and high quality audio between multiple locations (Alabi, 2012).

Screencasts Video Mediated Instruction

A screencast is a video recording on a computer screen. It’s ideal to be used when there is need to demonstrate a process or teach a computer-related function or task. Screencasts can include music, voice narration, and animated text, or they can be simpler and show only the on-screen action and result. When the learning objective is competency in a technical task, it may be best to make a screencast.

Ways of Delivering Video Mediated Instruction

There are three primary ways to deliver video mediated instruction proposed by (Greenberg & Zanetis, 2012:12–13), namely:

- **On-demand video**, whether locally based or delivered on demand video makes the use of internet to project instruction.
- **One-way video**, which may be time-ruled, packaged, broadcast TV, on demand streaming video, or real-time, instructor-based satellite TV.
- **Two-way interactive video**, which includes interactive videoconference, compressed interactive video, video teleconference (VTC), and telepresence.

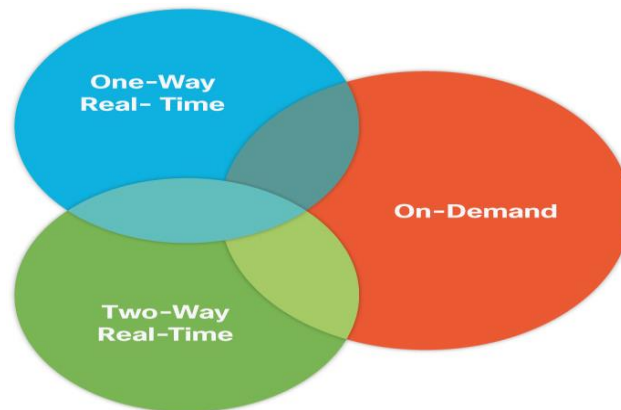


Figure 2: Three major groupings of video mediated instruction

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 in interactivity and 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 as cycle. The media through which video is accessed has evolved into time based on combination of cost and value equations (how affordable the technologies are) and pedagogical purpose (what the technologies can accomplish).

Properties of Video Mediate Technology

On-demand video

- Longer format Digital Video Discs (DVDs), Video Home System (VHS), and Laserdiscs. Examples of content delivered this way include movies, educational programming, and on-demand broadcast content.
- Shorter format segments including *YouTube* clips, enhanced podcasting, and video-on-demand (VoD casting) delivered via streaming capabilities.
- Lecture capture, including archive lectures made available on demand via streaming capabilities.
- Video games, delivered on demand or in real time.

One-way real time video

- Broadcast content, including educational programming.
- Streaming video, including live class or public events.
- Lecture capture, a form of streaming video delivered to some instances as live streaming as well as archive for on-demand viewing.
- Satellite delivery, which includes live instruction.

Two-way real time videos

- Satellite delivery, which includes two-way or multi-way live instruction in some instances.
- Interactive video- conferencing and telepresence technology, consisting of two or more locations linked with live instruction, presentations, and collaboration.

Purpose of Video Mediated Instruction

Video instruction as noted by Zhang; Zhou; Briggs & Nunamaker (2006) has the following purposes:

- Video mediated instruction helps present visual information that is difficult to convey in other ways.
- One of the appeals of video is that, it provides a sense of being there. Students can walk on the moon, or visit an erupting volcano without ever leaving the classroom.
- Video, like television, may condition viewers to be sensitive or to feel helpless in the context of such events.
- Not only do video allow students to travel to different places, they permit travel through time as well. Events of the past or great works of literature can be brought to life when characters, costumes and customs of the time and events are portrayed on the screen.
- Video provides dual channel learning. In fact, all students, both with and without a strongly dominated modality preference, benefit from video.
- Video can be used to demonstrate specific manual skills or physical processes, either at normal speed, in slow motion, or speed up to reveal relationships, principles or practices.
- Video can provide visual access to situations or experiences that would otherwise too dangerous or expensive for students to experience personally.
- Video can provide visual access to situations or experiments that would otherwise too dangerous or expensive for students to experience personally.
- They can be used to teach simply and complex ideas, using media Specific technique such as animation, computer graphics or motion.

Strategies for the use of Video-Mediated Instruction

Video is applicable to not only teaching but also for studying and learning in and outside the classroom. Zhang, Zhou, Briggs and Nunamaker (2006) list a sample strategies of how video is incorporated into each major application area:

- **Use 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 videos should be supported by the use of an interactive word glossary, dictionary, 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 the knowledge to enhance student learning development.

- **Web and DVD Based Clips:** In language classes by using web or DVD-based audio/video clips, 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.
- **Use of 3D Images:** Thomsen, Bridgstock and Willems (2014), report 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 into the human body, and can illustrate complex, abstract concepts through animated 3D images and show experiments that are not possible in class.
- Ward (1990) suggests that video conference is a two-way video transmission used in interactive conference to provide means to overcome the traditional physical attendance to a conference. Videoconferencing requires that both the transmitting and receiving site is set up with monitors and video cameras to project two-ends to the two group centres. 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 method, delivery of courses can occur in a manner as close to live instruction as possible. In order for video-conferencing to be effective, students must be at a given location at a given time in order to participate. This therefore, stand as one of the significant advantages offered by a distance education program.

Aboyeji (2014) identified the following strategies for an effective implementation of video mediated instruction;

Integrate immediate assessment and feedback. Have students complete a practice assessment after viewing the video and provide immediate feedback to ensure understanding of the material. Studies show that including an assessment at the end is more effective than just viewing the materials multiple times.

Encourage note taking and reflection. Encourage students (particularly those who are unfamiliar with the topic) to take notes while watching the video or answer conceptual questions in between the video to help improve long-term retention of the material. Using a tool such as CLAS can help encourage active engagement with the material through annotation and commenting.

Keep the content focused. Avoid including interesting facts or anecdotes in your video that are not crucial to the learning experience as they become distractors that can decrease learning by reducing both recall and problem-solving performance.

Break up material into clear sections. When explaining complicated cause-and-effect concepts that are related simultaneously, divide the explanation into segments and have students view them separately before showing the full explanation. This encourages students to understand one concept before moving onto the next and allows the learner to control the pace of their learning.

Use conversation style. Use a conversational style in your videos (such as “you” and “your”) rather than a formal style (such as “students should...”). This will help students to feel more personally connected to you through the video which helps to reduce the lack of presence when materials are moved online.

Avoid too much visual information. Try to use graphics and narration to communicate concepts. Avoid adding too much printed text to prevent cognitive overload as it is difficult for the brain to read and listen at the same time.

Limit video length. Try to limit video length for online viewing. Instead of uploading an hour long lecture, break the material into multiple, shorter videos. While 6-8 minutes is often given as a target, it is important to consider the context and purpose of the videos as well as the overall amount of video content students are expected to watch each week. Some academic concepts cannot easily be reduced to a 6 minute

explanation, so if you do go longer make sure the material is focused and tied closely to assessment activities.

Design for reuse and longevity. Video is expensive and time consuming to create, so you want to make sure you can use the same videos from term to term without having to redo them. Avoid including dates and references to current events that will limit the potential of reusing content from year to year.

Benefits of using Video Mediated Instruction

Video, in its various guises and modalities (broadcast television, Laserdiscs, camcorders, videocassettes, DVDs, streaming video, satellite video, webcams, videoconferencing, and lecture capture) have been a strong enhancer of instruction (Sinha, 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 who use 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 (2017), outline below some benefits:

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 include 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.

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.

Classroom exercise: Research has demonstrated that the most effective way to use video involves classroom lesson, or unit of study. Video should be as an instrument of instruction along with other resource material available to the teachers for teaching a particular topic.

Classroom enrichment: Video gives students the opportunity to travel to remote places outside the classroom walls without leaving the school premises in their course of learning.

Accelerated learning: Many rural and even urban secondary schools lack teachers in certain areas. One-way such could be handle by using video tapes to pass instruction to the learners way ensure 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 as, auditoriums, and classroom work. The content may be purely instructional or a blend of entertainment and information.

For professional development: Primary and secondary school teacher 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 teachers can also take advantage of recorded seminars and online virtual communities when they miss the 'live' version.

Challenges to Videos Mediated Instruction

However, challenges exist on adoption of video instruction in the classroom. These challenges are:

Technological challenges: Some institutions see video instruction to be a challenge due to access to network, especially when fluctuate mostly in rural areas. Others cannot afford signal from their service providers necessary to deliver the quality of service expected by their teachers and learners. The way students and teachers use the technology and the genuinely to the implementation might hinder success. Leadership, teacher proficiency, professional development, curriculum, school culture, and pedagogical approaches and to some degree by levels and types of technology accesses to determine the fidelity to technology implementation in a school (Metiri, 2009).

Equipment failures and reliability represent significant challenges in adopting video or any other type of technology in the classroom. Technical hitches might stem from the hardware as well as the software, and some teachers do not have the background to troubleshoot when problems arise. Continuous technical challenges with the equipment might jeopardize the flow of information in the class, creating frustration and reducing the teacher's motivation to use the technology.

Legislative challenges: Technologies in some countries must meet requirements of special needs of learners. In other cases, there might be an absence of science and technology policy or even 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.

Epileptic power supply: In a situation where the power supply is regular or constant, the possibility of using self-generated power become a very high cost to the school system. Sometime, the video may go off due to low voltage or abrupt power off and may damage the equipment.

Behavioural challenges: Behaviours, attitudes, expertise, and preconceived ideas can be a challenge when adopting any new technologies or teaching methods. In the views of Polin (1992), there are four stages of behavioural pattern of teachers in adoption and integration of multimedia technology into the classroom namely.

The comfort zone, when the teacher is acquainted with the equipment and its operation, there is a likely hood for such teachers to give in their best in the classroom.

Disjointed instructional use: This happens when the instructor is able to work with the technology, but is still unable to integrate it with her instructional goals.

Integrated instructional use: This is a situation when the teacher is able to integrate the technology into her instructional plans, with the technology driving the instructional plans.

Transparent integration: This happens when the focus moves from technology to content and instructional strategies. At this stage, the technology becomes one of many tools used by the teacher to accomplish the educational goals. Some teachers are reluctant to teach on a camera and feel at disadvantage together with their students regarding video technology as a replay of weaknesses.

Faculty challenges: This is especially the case of some post-secondary teachers that lack appreciation of technologies, particularly if they believe that intellectual property and digital rights issues may be at play (Dey, Burn & Gerdes, 2009).

Resource-based challenges: Some studies find the percentage of high-quality educational TV programs to be low (Metiri, 2009). This of course, depends on the subject matter and educational level discussed. For example, textbook publishers have become more media savvy in recent print production both rich educational media and video

Success Factors: Design and pedagogy are factors that determine the effectiveness of video in educational delivery. Many teachers lack an understanding of when and how to apply video (Lambert & Cuper, 2008) in their teaching services.

Conclusion

Emerging technologies and video mediated instruction provide easy methodology for students comprehension and knowledge internalization. Historical development of video mediated instruction show that there is a paradigm shift from traditional methods of teaching and learning in the contemporary education. With the help of video mediated instruction, teachers can make teaching to be more practical rather than theoretical. Challenges of video mediated instruction such as legislature and behavioural pattern of teachers, students and the society at large should be positively tailored towards the accomplishment of school objective.

Recommendations

From the discussion, the recommendations on integration of video in instruction are as follows:

- There should regular power supply that will enhance video mediated instruction in schools.
- Teachers should be trained to manage the educational changes as a result of technology.
- Government and house-hood should give education the financial push to enable them equip instructional resources.
- Instructional technologies should be maintain to a sure completion of their lifespan.
- Student ratio per equipment may not be more than 1 to 25 students to ensure effective teaching and learning processes.

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