GENDER DIMENSION FROM EFFECT OF MOBILE INSTRUCTIONAL APP ON UNDERGRADUATES' PERFORMANCE IN ECONOMICS

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Abstract
Gender dimension in educational technology is becoming critical within the context of patriarchal Nigerian society. Thus, this study examined effect of mobile instructional app on undergraduates' performance in economics from the dimension of gender. The research design adopted for this study was a quasi-experimental design. All undergraduates from Sokoto State University formed the population of the study. An intact class of 34 (23 males and 11 females) two hundred level undergraduates of Economics was purposively sampled for the study. Two instruments were developed and used for this study: Mobile Instructional App (MIA) and Economic Principles Test Instrument (EPTI). Descriptive statistics (mean) was used to answer the research question, the only null hypothesis of the study was tested using independent samples t-test. Findings revealed that there was no significant difference between male and female undergraduate students' academic performance in the use of mobile instructional app in economics. It was recommended that university curriculum should be made flexible to accommodate the use of mobile devices for learning process, and that undergraduates should endeavour to explore the opportunities offered by mobile instructional app for an improved academic performance irrespective of gender difference.

Keywords: Gender dimensions; Blended Learning; Mobile Instructional App; Students' Performance and Economics.

Introduction

Blended learning encompasses variety of learning contexts by juxtaposing conventional learning with technology-enhanced learning usually through utilization of mobile technologies. Portability, context sensitivity, ease of use and ubiquitous nature of mobile devices and applications make them friendly technology to meet up with the learning style of the students of native age. Mobile technologies are devices and applications (apps) such as personal digital assistants (PDAs), smart phones, pocket personal computers (PCs), social media apps, and Bluetooth that can store, access, create, modify, organize, or manipulate data in various forms from a location without being required to be joined to any particular spot (Ozumba, 2015). Mobile technologies are also apprehended to be simple PDA like a stock Handspring Visor, a palm operating system device, and act merely as a pot for a small amount of static information (Packard, 2015; Rogers et al., 2002). Mobile devices are portable, handheld and support social interaction among learners (Kam, Kumar, Jain, Mathur, & Canny, 2008).

Najmi and Lee (2014) identified five properties of mobile devices (PDAs, smartphones, tablets, iPods) that produce unique educational affordances: Portability - mobile handheld devices are not so big, thus convenient to carry along. Social interactivity - mobile device enables interaction among peer groups through media chats such as WhatsApp, Facebook, 2go and so on. This also helps students collaborate in educational discussions, literature review, among others. Context sensitivity - mobile devices are friendly for use irrespective of location. These devices are programmed to accommodate varieties of software and apps to serve individual and group demand. Connectivity - ability to connect to the Internet and share information and files online is another feature of mobile handheld device. Individuality - mobile device can be customized to serve the needs of different individual learners.

Mobile device refers to any device that one can carry to perform a wide variety of tasks. It is a technology that allows those tasks to be performed via PDAs, smart phones, tablets and so on (Mikre, 2011). A standard mobile device has gone from being no more than a single two-way pager to being a cellular phone, a GPS navigation system, a web browser, and instant messenger system, a video gaming system and much more (Voogt, Knezek, Cox, Knezek & Brummelhuis, 2013). It includes the use of a variety of transmission media such as: radio wave, micro wave, infrared, GPS and Bluetooth to allow for the transfer of data via voice, text, video, two-dimensional bar codes, and so forth. Mobile devices can effectively be used for learning through the utilization of instruction packages known as mobile applications.

Mobile instructional packages are mostly found as “applications” that are developed for a specific purpose (Otieno, 2015). As the name implies, these packages are mostly on handheld devices of different kinds. These apps are divided into three categories, web applications; native applications and hybrid applications (Ali, 2013; Oyelade, Oladipupo & Oyejoke, 2010). Native application is the commonest package found on Blackberries, iPhones, iPods, androids, and so on. Web application is the type of app usually found on websites for online consumption. Hybrid application comprises the features of both native and web applications. Mobile learning affects learners through cooperation, motivation, availability and information sharing (Adesulu, 2015).

Cohen, Lowrie, and Preston, (2011); Ozumba, (2015) reported that education through mobile technology has positive effect on the intensity of motivation. As such, both intrinsic and extrinsic motivation need to be aroused to inculcate students' learning in subjects such as economics, geography, sociology and so on. In spite of the submissions made by scholars that mobile device is an effective learning tool, there are junks of arguments as to who performs better academically in the utilization of mobile technology between male and female. Gender is a factor that plays significant role in the record of students' performance. Influence of gender might be neglected but it strongly determines who could do what in the use of ICT tools especially the handheld devices (Anagbogu & Ezeliora, 2007; Cotton, Anderson & Zeynep, 2009; Omonijo & Nnedum, 2012). Gender is a factor that needs to be considered in the use of technology (Yusuf, Gambari & Olumorin, 2012). Survey data indicate that in absolute terms, male mobile readers vastly outnumber female mobile readers in the world (Anagbogu & Ezeliora, 2007). On average, there are approximately 3 male mobile readers to every 1 female. The gender gap is slightest in Nigeria and Zimbabwe (UNESCO, 2014).

Girls traditionally have perceived themselves as less skilled in terms of technology, this has a lot to do with gender socialization (Cotten et al., 2009). Ifamuyiwa and Akinsola (2008); Onasanya, Nathaniel and Temitayo (2012) are of the view that the use of technology to improve students' academic performance has nothing to do with gender (UNESCO, 2014). Exposure in using technology is different among age and gender. Gender differences exist in use of social and web based media, consumption patterns, attitudes and culture toward technology (UNESCO, 2015). The researcher is of the view that females are more likely to use mobile phone than their males' counterpart. They stayed mostly at home playing games and interacting with friend through social media. Mobile technology has become one of the emerging technologies in the world, with mobile phones as an integral part of the life of students regardless of their gender (Wang & Shen, 2011). Attempt to ascertain who performs better academically between male and female students in the use of handheld devices triggered the attention of the researchers to carrying out a research on the influence of gender in the utilization of mobile instructional app on undergraduate students' performance in economics.

Research Question

The following research question was answered in this study:

1. What is the difference in the academic performance of male and female undergraduate students in the use of mobile instructional app in economics?

Research Hypothesis

Based on the research question, the following null hypotheses was tested:

Ho_1: There is no significant difference between male and female undergraduate students' academic performance in the use of mobile instructional app in economics.

Methodology

A quasi experiment with pretest and posttest, non-randomized, non-equivalent comparison design was adopted for the study. All the undergraduate students of Sokoto State University (SSU) formed the population of the study. An intact class of 34 (200 level) students was purposively selected as

sample for the study. The class was divided into two groups (23 male students and 11 female students). Pretests were conducted to the two groups to determine students' performance baseline, both groups were exposed to the treatment (Mobile Instructional App) for four weeks after which post-tests were conducted. An instrument pegged "Economic Principles Test Instrument (EPTI)" was validated by experts. After a pilot study was conducted, reliability co-efficient of 0.78 was obtained using Kuder Richardson (KR-21) at 0.05 level of significance.

Results

This section presents results from the study as followed:

Research Question: What is the difference in the academic performance of male and female undergraduate students in the use of mobile instructional app in economics?

Table 1:
Pre-test and Post-test Mean Scores of Experimental Group Based on Gender

Gender	N	Pre-test Mean	Post-test Mean	Mean Gain Scores
Male	23	12.04	17.61	5.57
Female	11	14.36	18.36	4.00

Table 1 presents the pre-test and post-test mean gain scores of the undergraduate students based on gender. Mean gain scores of 5.57 and 4.00 were obtained for male and female respectively. This indicated a slight difference where male undergraduate students performed better than their female counterpart in the subject matter of Economics.

Research Hypothesis: There is no significant difference between male and female undergraduate students' academic performance in the use of mobile instructional app in economics.

Table 2:
t-test on the Academic Performance of Male and Female Undergraduate Students in the Use of Mobile Instructional App in Economics

Gender	N	Mean	Std. Dev.	Df	*t*	Sig. (2-tailed)	Remark
Male	23	17.61	1.75				
				32	1.07	0.292	Not Sig.
Female	11	18.36	2.25				

**Statistically significant at 5 percent significance level.

Table 2 presents the result of *t*-test in respect of the research hypothesis. The mean score for the male and female undergraduate students were respectively 17.61 and 18.36, while the standard deviation for the two groups were 1.75 and 2.25 respectively. The *t*-test result $t(32) = 1.07$, $p>0.05$ (two tailed) revealed that there was no significant difference between male and female undergraduate students' performance in the use of mobile instructional app in economics. Thus the null hypothesis was retained.

Discussions

The result reveals that no significant difference was found in the academic performance of male and female undergraduate students in the use of mobile instructional app in economics. This indicated that the use of mobile technology for mobile learning is gender friendly. This is in line with the assertion that the use of technology to facilitate learning and improve students' performance has nothing to do with gender (Ifamuyiwa & Akinsola, 2008; Onasanya, Nathaniel & Temitayo, 2012). The finding nullified the assertion made by UNESCO (2015) that gender difference exists in the use of technology for learning among students. It also opposed the affirmation that gender sharply determines who could perform better in the use of technology for learning (Anagbogu & Ezeliora 2007; Cotton, Anderson & Zeynep 2009; Omonijo & Nnedum 2012).

Conclusions

Research on gender dimension in the context of learning technology and performance was generally inconclusive. Though the bulk of literature sources indicated significant differences between male and female students with regards to their utilization of mobile app for learning and improvement in their academic performance, but the differences were consequential to cultural settings and specific subject matter. The previous findings tilted towards higher academic performance of male students such that the female students were generally found to be skeptical, naïve and less-resistant to mobile app for learning. However, this study found no significant difference between male and female undergraduate students' academic performance in the use of mobile instructional app in economics largely due to differences in cultural setting and subject matter.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. University curriculum should be made flexible to accommodate the use of mobile devices for learning.
2. Undergraduate students should endeavour to explore the opportunities offered by mobile instructional app for an improved academic performance irrespective of gender.

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