

THE PAPERLESS CLASSROOM: VIEWS OF THE UNIVERSITY OF ILORIN UNDERGRADUATE STUDENTS

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Abstract

Technology proliferation rate in the 21st century has affected the way everything is done with a ripple effect on the methods of teaching delivery in university education. Regrettably, most universities in Africa are yet to join the bandwagon because they are still embracing the basic and medieval methods that developed countries are trying so hard to leave behind. Paperless classroom is the future trend and to make it a reality in Nigeria, students play a pivotal role. This study addressed the perception and attitude of students on the adoption of a paperless classroom in the University of Ilorin. Five research hypotheses were developed based on the Technology Acceptance Model (TAM). Using stratified and purposive sampling methods, 100 respondents were sampled and a 21 item questionnaire was administered to collect data. Results showed that perceived ease of use and attitude are strong predictors of behavioral intention to adopt paperless classroom. Contrary to findings from other studies, perceived usefulness was discovered to have no significant influence on the respondents' attitude towards using paperless classroom. Finance, challenges of electricity supply and complexities in the implementation were revealed as factors that can constitute challenge to the implementation of paperless classroom. The study concludes that the university administration must ensure that the views and specifications of the students are actively sought, carefully considered and meticulously included in the planning and implementation processes of a paperless classroom.

Keywords: Perception, Attitude, Behavioural intention, Paperless Classroom

Introduction

Students' learning in tertiary institutions all over the world has undergone tremendous transformation, especially since the advent of information and communication technology (ICT) (Bassey, Umoren, Akuegwu, Udida, Ntukidem and Ekabua, 2007). There has been a shift from traditional approach of teacher directed to modern methods where computer technology plays a significant role. This has promoted learning and made it more meaningful, where students can stay even in their homes or Classrooms and join in on lectures without physical presence (Adewole-Odeshi and Egbe, 2014).

According to Bassey et al, (2007), a classroom is paperless in the narrowest sense, when the use of papers in that classroom is fully replaced by IT equipment or is placed side-by-side the paper in the instructing or impartation of knowledge from the lecturer to the student. This generation has witnessed a lot of developments and improvements in the way things are done thanks to the advent of ICT whose effects has been felt in all sectors of a country's economy

including the education sector. Liverpool, Marut, Ndam and Oti (2009), maintained that advances in ICT have revolutionized education in many ways; for example, increasing access to postsecondary instruction, improving the availability of educational resources, and facilitating meaningful interaction among learners, therefore, harnessing the power of ICT has become a critical strategy among institutions eager to offer an affordable, efficient, and flexible learning environment for rapidly growing and diverse communities of learners.

In some tertiary institutions in Nigeria, University of Ilorin inclusive, there has been an encouraging level of ICT compliance, although this is restricted to the famous Computer Based Tests (CBT), online registration portals and staff/student online data management through the university's website (Alabi, Issa and Oyekunle, 2012; AbdulRahman, Balogun and Yahaya, 2014; Bappah, 2010). Tertiary institutions cannot actualize the goal of a paperless classroom if they don't make it a thing of the past, the culture of just getting a building, buying computers off the used-product markets and calling it an electronic learning center where there's no constant electricity supply and no internet connectivity, coupled with the fact that these buildings are always under lock and key. Moreover, in institutions where the ICT equipments are ready to go to work, it does not have the magic wand to transform the learning environment of the students without a teacher with the technological, pedagogical and content knowledge (TPACK) to use them in the classroom situation (Mishra and Koehler, 2006).

The digital age has provided a good and robust pedestal for institutions to leverage on and utilize to the best possible level. The University of Ilorin is one of the Nigerian universities that provide students with access to the university's internet facility at a subsidized rate, a step towards actualizing e-learning. More than encouraging has been the university's adoption of CBT for assessing students in various courses they offer both in continuous assessment tests and examinations. So to a large extent, virtually all students use ICT equipments in the course of their study (Alabi, Issa and Oyekunle, 2012; AbdulRahman, Balogun and Yahaya, 2014).

The number of students seeking and being offered admissions into Nigerian Universities has increased over time. In particular, the University of Ilorin matriculated 11,057 and 10,886 students in the 2015/2016 and 2016/2017 academic sessions respectively, adding to the already crowded population of students coupled with the limited classroom infrastructure and lecturers to match. Consequently, information (knowledge) impartation seems almost impossible and in cases of its success, largely ineffective. It is therefore imperative to find other means to supplement and compliment as the case may be the inadequate and ineffective learning situation the continent of Africa has been battling with for years. (World economic

forum on Africa, 2013; Bello, Ehira, Balogun, Ayeni and Faruq, 2014). They further stated that there has always been the issue of having multiple lecturers taking the same course because the students taking the courses have to be divided into groups with each lecturer taking a particular group which indisputably leads to disparity and inequality in the quality of knowledge delivered to the groups since they all paid the same amount to obtain knowledge which consequently, without an iota of doubt affect students' performance. Bello et al. (2014) further argued that since universities sponsor their lecturers for further studies, they should look into ways of ensuring the lecturers continue to take part in the teaching process of their students even if they are not physically on ground.

Pursuant to the above paragraphs, there's the need to bolster the learning and pedagogical environments in universities and other higher institutions of learning by supplementing or substituting as the case may be the traditional approach to teaching and learning with paperless classrooms, yet this can amount to financial and infrastructural waste and failure if the end-users are not consulted and brought to the fore of the quest to implement and imbibe it. This is why the current study examined the perception of students of the University of Ilorin on paperless classroom and its impact on adopting it as a teaching/learning medium.

Paperless Classrooms

According to Solomon (2013), paper has been a medium of convenience, accessibility, affordability and familiarity, the past few centuries. And yet, as the world ushers in a digital zeitgeist, our modes of communication, interpersonal interactions, information access, instructional methodology, the learning and creative process have undergone a tremendous change. The world has moved a long way indeed from clay tablets, papyrus and vellum, although the latter is still being used as a medium to write the British Acts of Parliament, dating back to 1497, for archival purposes. Paper too is slowly losing its coveted place as medium of choice for dissemination of information; in every sphere of life, it's slowly becoming secondary for many reasons, especially in works where sensitive information is transmitted from one place to another (Solomon, 2013). But the most important reason for this is speed and ease of using electronic means for information dissemination which paper cannot afford its many users. Students in contemporary times being digital natives makes it sufficiently easy in the endeavor towards a paperless classroom and the sheer momentum of change in technology, its various exponentially increasing uses and changes in interfaces can be overwhelming but not

insurmountable (Solomon, 2013). Therefore, submitting to the inevitable and predictable change makes the transition towards a digitized classroom all the easier and smooth sailing.

According to Bello, et al. (2014), University of Nairobi has implemented three different paperless classrooms called “learning management systems (LMS)” in the last five years: Wedusoft, Chisimba and Claroline. Wedusoft was specifically developed by a member of staff for the university while Chisimba was adopted and implemented through collaboration with development partners; currently the university is using Claroline LMS. However, none of the LMS have been utilized to their potential, and the success of LMS-supported paperless classroom at the university is described as minimal (Ssekakubo, Suleman, and Mardesn, 2011). Currently, the University of Cape Town is using Sakai as their major LMS which has been customized and branded as Vula. But in the past, the university has deployed Moodle and WebCT as well. However, they still continue to seek for virtual learning platforms that would satisfy most of their requirements (Ssekakubo et al., 2011). Share-point, a Microsoft content and document management system was used at, Nelson Mandela Metropolitan University to make courses available for sharing and collaboration in a blended environment. However, the platform was found to be less flexible, and had limited interactivity options. As a result, it migrated to Moodle, and currently uses it as its Learning management System (Ssekakubo et al., 2011).

From the generally held positions and observations described above, universities in Africa have invested in the use of LMSs like Moodle, Sakai, Blackboard etc. These LMSs have only been successful in maintaining the learning process between the students and their lecturers; but with little or no provisions and capacity to solve peculiar challenges such as overcrowded classrooms, and limited human resources as being experienced within the Nigerian academic environment. (Bello et al. 2014).

Evident in all these experiences is the need for the seeking of students’ and staff perception and attitudes towards electronic teaching and learning and this view was echoed by Ssekakubo, et al., (2011) stating that the numerous researches conducted in the area of designing virtual learning environments have arrived at strikingly similar conclusions regarding the major educational benefits of purposefully designed virtual learning environments. In other words, virtual environments designed to accommodate a specific learning activity, may have positive effects on learning if it is compatible with the educational activity that takes place within the given academic institution. Conversely, a virtual learning environment that is ill-suited for a specific task might have adverse effects on the learning

performance of students utilizing the platform (Meloni, 2010). Following this line of reasoning, the architectural design of a paperless classroom should manifest the pedagogy–related features of a given university in order to encourage a desired educational approach among students and staff because their perception and attitudes to it is quite integral to the success of these paperless classrooms (Ssekakubo et al., 2011).

Current State of Paperless Classrooms in the University of Ilorin

In 2013, the University of Ilorin deployed a learning management System to facilitate learning and correspondence between the lecturers of University of Ilorin and its open distance learning students (Post-Doctoral Diploma in education). Via this platform, lecturers can post lecture notes, send assignments, information notice, grade students' performance and send results to every registered student on the platform. Although this platform has been in use for a while now, it has not been fully maximized and explored to cater for other courses in the open distance learning sector (Bello et al., 2014). More importantly it does not yet support a real time communication between the lecturers and the students (Center for Open and Distance learning-University of Ilorin, 2013). In the same year, University of Ilorin Management delivered on its promise to make learning in the institution digital with the launching of the I-pad initiative for fresh student, this was a welcome idea as student lauded the initiative. According to the Unilorin Bulletin (February, 2015), the Nigerian Communications Commission (NCC), Abuja donated a smart classroom containing 50 sets of computers, conferencing facilities, voice-over IP, alternative power supply, interactive board, audio equipment and so many other appliances worth several millions of naira to the institution. This according to the Director of the institution's Computer Services and Information Technology (COMSIT) Directorate, will serve as an e-learning platform among other uses.

In addition, Globacom and the University of Ilorin entered into a partnership to take tertiary education in Nigeria to a higher level as they have agreed to initiate a platform where students can access their lectures and lecturers from anywhere in the world (Globacom, 2016). The University has also partnered with companies like Intel and Institutions outside the country on e-learning.

Benefits and Challenges of Paperless Classrooms

The advantages that technology provides to training and learning include not only the possibility of one-on-one interaction for every learner, the ability to simulate new ideas, the

chance to try things out at one's own pace and to fail in private without the fear of ridicule from other students. This is one of the biggest and greatest advantages of a paperless classroom (Galagan, 2002).

The implementation of a paperless classroom comes with some incredible advantages including the electronic dissemination of class notes and reference materials to delineate accurately the information the lecturer wants to impart on the students and reduce the stress involved in oral dissemination thereby removing the space for errors and in cases where a student missed out on some lines he won't have to bother the people around him/her for clarification. Also, the issues of students having to submit assignments or group works in hardcopies with the lecturers having to go through a lot of paper work, use pens to peruse and append marks on the multiple papers are eliminated by the paperless classroom. These assignments when turned in by the students are sometimes just copied from an online source and typed like it's an original thereby misleading the lecturers and guilty of plagiarism. But with the paperless classroom, when students submit their respective individual and group works, the lecturers can easily run a plagiarism test on these works.

According to Ellis-Behnke, Gilliland, Schneider and Singer (2005), some of the advantages of adopting a paperless classroom technology include improvements in student performance, decrease in the number of students who perform poorly, increase in the amount of information delivered, ease of organization and editing of class material and notes by students. While Dongsong, Zhao, Lina, and Nunamaker (2004), stated that learner-centered and self-paced, time and location flexibility; cost-effectiveness for learners and instructors; potential availability to a global audience and unlimited access to knowledge re-use and sharing are advantages of a paperless classroom as compared to a traditional learning classroom:

Despite all the benefits and advantages of the paperless classroom, there exist some challenges. Abubakar (2015) identified inequality of access to the technology itself by all the students known as digital-divide and technophobia as part of the bottlenecks. He describes the digital-divide phenomenon as that which creates gap between people who possess regular access to technology, such as computers and their related functions like ability to get to the internet and those who do not have access. Furthermore, there is still a large number of students and lecturers who have low ICT literacy skills.

One of the challenges according to Schulz and Apostopolous (2009) is epileptic power supply. The poverty level in the country makes it impossible for most Nigerians to have good quality electric generating plant. Right from time immemorial, power supply has always been

the biggest hindrance to innovation and industrialization in Nigeria. Those companies, organizations and educational institutions that need power to ensure they stay in business mostly run it on their own power generating set. This therefore poses a great threat to the success of implementing a paperless classroom in Nigeria. Another challenge peculiar to Africa is this problem of superstitious belief over the use of ICT facilities. Some people associate computer with 666 which means that it is satanic. According to Nworgu (2006) people tend to resist innovations and changes, they show a great deal of reluctance to embrace new technology because every ICT innovation has a spiritual background to it.

Etesike (2008) and Chidobi (2015) posited that the niggling problem with the ICT utilization in universities is the poor nature of the beliefs, attitude and competence of the university administrators over ICT tools, i.e. the provision of the technology alone isn't the factor but if it is made available by the bodies and organizations but the users (staff/students) are incompetent to handle or manipulate them, it becomes a white elephant project. In addition, Conkova (2013) stated that at present, paperless classroom is still at its infancy with many unsolved questions. Although some research has shown that paperless classrooms can be at least as effective as conventional classroom learning. In her study, Conkova (2013) revealed that some trainees claimed that although learning in a paperless classroom is interesting and effective, if given the choice, they would still prefer the traditional system of teaching with the teacher in the classroom. Teaching and learning in a paperless classroom requires more maturity and self-discipline from students than in the case of classical education, which may explain the higher rate of students dropping out and failing to complete their online learning programmes. (Hiltz and Wellman, 1997).

Lastly, some logistics problems are associated with the operation of a paperless classroom. An electronic learning environment requires more of the lecturers' time to prepare the lesson than it is needed in case of traditional teaching; besides, certain types of teaching/learning materials are too difficult or expensive to be used in a paperless teaching class.

Theoretical Framework

There are various theories of technology acceptance used to assess perceptions and attitude. One of such models is the technology acceptance model (TAM) developed by Davis (1989). According to Hayashi, Chen, Ryan and Wu (2008), TAM was built upon Fishbein and Ajzen's (1975) theory of reasoned action (TRA) which posits that individual behaviour is

driven by behavioural intention, where behavioural intention is a function of an individual's attitude toward the behaviour and subjective norms surrounding the performance of the behaviour. TAM as proposed by Davis describes that a person's behavioral intention to use a new technology is determined by perceived usefulness and perceived ease of use (Mahdizadeh, Biemans and Mulder, 2008). Saade, Nebebe and Tan (2007) have noted that individuals will use technology when they perceive that the technology will enhance their performance.

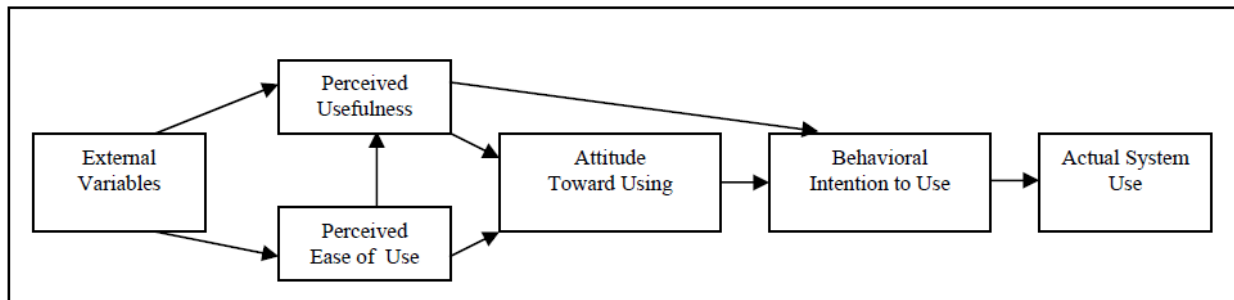


Figure 1: Original Technology Acceptance Model (Davis, 1989)

TAM theorizes that an individual's behavioural intention to adopt a system is determined by two beliefs: perceived usefulness and perceived ease of use. **Perceived usefulness** is defined as “the degree to which an individual believes that using a particular system would enhance his or her productivity” while **perceived ease of use** is defined as “the degree an individual believes that using a particular system would be free of effort” (Davis, 1989). **Attitudes towards use** is defined as ‘the user's desirability of his or her using the system’ (Malhotra and Galletta, 1999). **Behavioral intention** is predicted by attitude towards use combined with perceived usefulness, while **actual use** is predicted by behavioral intention.

Some studies (Mbengo, 2014; Lee, Cheung and Chen, 2005; Elliott and Fu, 2008; Masrom, 2007; Al-Adwan, Al-Adwan and Smedly, 2013) verified empirically the relationship put forward in the TAM model in the context of learning electronically, that perceived ease of use and perceived usefulness helps in reducing the uncertainty of innovations leading individuals behavioural intention to adopt a new technology. Other studies have also indicated that attitude directly and significantly influences behavioural intention to use a particular technology (Venkatesh, Morris, Davis and Davis, 2003). However, too few studies (Liaw, Huang and Chen, 2007; Wang, 2009) verify the relationship between attitude and intention. Such attitude towards using the technology determines the behavioral intention to use that technology. i.e. if a user has a positive attitude towards using a technology, the individual is

more likely to adopt it. Attitude in conjunction with perceived usefulness and perceived ease of use all culminate into the two factors that have been found to have significant effect on an individual's behavioural intention to adopt a technological innovation.

To investigate the attitudes and perception on the adoption of paperless classroom of students in the University of Ilorin, a descriptive survey research was employed. The total population of registered undergraduate students for the 2015/2016 academic session was over 30,000 out of which 100 students was conveniently sampled due to easy accessibility, geographical proximity, availability at time of data collection and willingness to participate in the study. Stratified sampling technique was used to select students from all the fifteen faculties in the university, while a 21 item questionnaire modified from previous studies was used to collect data on demographic information, perceived ease of use, perceived usefulness, behavioural attitude and behavioural intention to use a paperless classroom.

Data generated from this study was analyzed using SPSS 21.0 software. Test statistics like p-value was used to decide whether or not to accept or reject the stated hypotheses and correlation was used to measure the relationship between variables.

Discussion of Findings

The findings of this study lend the understanding that perception and attitude plays a significant role in determining the adoption of a paperless classroom at least among the sampled respondents, by using theoretical basis derived from the technology acceptance model. The results of this study confirms that there is a statistical correlation between the predicted directions of the research model as four out of five hypotheses tested were supported by the data collected.

The strong positive linear relationship between perceived ease of use and perceived usefulness of a paperless classroom which is significant at .003 ($p < 0.05$) is in agreement with the findings of Mbengo (2014); Venkatesh et al. (2003); Al-Adwan, Al-Adwan and Smedly, (2013); and Al-alak and Alnawas (2011). This implies that the respondents believe that they would find it easy to use and relate with a paperless classroom. The moderate positive linear relationship found between perceived ease of use and the attitude of students towards using a paperless classroom at .016 significance level ($p < 0.05$) indicates that students are willing to use and embrace the paperless classroom because they believe that using it would be free of effort. This finding is also consistent with previous studies like that of Mbengo (2014).

Furthermore, the third hypothesis tested in this study concerns whether there is a significant relationship between perceived usefulness and behavioural attitude towards adopting a paperless classroom. However, the result of the test of this hypothesis (.094 significant level) illustrates that at least among the sampled students, the degree to which they believe that using a paperless classroom would enhance their productivity does not bond adequately with their desirability of using it. This is contrary to the findings of Davis (1989); Barclays and Osei-Bryson (2012) and the TAM assertion. The fact that the respondents have a high perception of the usefulness of a paperless classroom but that didn't appreciably influence their attitude towards adopting it is a source of concern. On the surface, this suggests that the students' perception of the usefulness of the paperless classroom technology needs to be solidified.

In addition, with significance level of 0.001 ($p < 0.05$), perceived usefulness proved to have a very high significant relationship with behavioural intention to adopt a paperless classroom by the students which is in line with the TAM assertion. It can therefore be concluded that perceived usefulness greatly predicts the behavioural intention of students of the University of Ilorin to adopt a paperless classroom. Meaning that the respondents' high perception of the usefulness of a paperless classroom would make them to go all out to adopt or implement it into the teaching/learning system in the University of Ilorin.

Lastly, a moderately positive linear relationship was found between attitude and behavioural intention to use paperless classroom at a significance level of .019 ($p < 0.05$). This result corroborates the findings of Venkatesh et al. (2003) who found that attitude greatly influenced behavioural intention to use a particular technology. Just like in the field of telemedicine, attitude has been discovered to be the second most important determinant of physicians' intention for accepting telemedicine technology (Chau and Hu, 2001). It is therefore not surprising that a significant influence is exerted by attitude of students of the University of Ilorin on their behavioural intention to adopt/use the paperless classroom.

Table 1: Result of Correlation Analysis

Hypotheses	Significance	Correlation Value	Results of Hypotheses Test
Students' Perceived Ease of Use will significantly influence their Perceived Usefulness of a paperless classroom.	.003	.940	Supported

Students' Perceived Ease of Use will significantly influence their Attitude towards using the paperless classroom.	.016	.640	Supported
Students' Perceived Usefulness will significantly influence their Attitude towards using the paperless classroom.	.094	.310	Rejected
Students' Perceived Usefulness will significantly influence their Behavioural Intention to Use a paperless classroom.	.001	.970	Supported
Students' Attitudes towards using a paperless classroom will significantly influence their Behavioural Intention to Use the paperless classroom.	.019	.600	Supported

Implication of the Research

Based on the findings of this research work, it can be concluded that the students of the University of Ilorin believes that using a paperless classroom is free of effort and would enhance their productivity, as a result, they are ready to adopt and use it. However, students' perception of the usefulness of the paperless classroom technology needs to be strengthened so as to translate to better attitude towards using it. The university management has a critical role to play in ensuring students are given and afforded the best learning and teaching environment that is available to reduce the stress exerted on students and lecturers in the knowledge delivery and reception process, which the paperless classroom can achieve. The government must also provide a facilitating and enabling environment for the flourishing of technological innovations because the success of a paperless classroom technology is dependent on the availability of infrastructure and social amenities largely and most importantly, electricity supply. Hence, to make the paperless classroom a success, all factors that will mitigate its successful implementation must be eliminated.

References

- AbdulRahman, A., Balogun, N. A. and Yahaya, I. S. (2014), Information Technology enhances students' academic performance: a case of university of Ilorin. *The online Journal of Distance Education and e-Learning*, 2 (2), 15-20.
- Abubakar, U. A. (2015). E-libraries, E-readiness: Imperatives for e-learning delivery in National Open University of Nigeria (NOUN). Proceedings of the 4th Teaching and Learning in Africa Conference. Namibia. June 8–15, 2015.

- Adewole-Odeshi, E. (2014). Attitude of Students Towards E-learning in South-West Nigerian Universities: An Application of Technology Acceptance Model. *Library Philosophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/libphilprac/1035>.
- Alabi, A. T., Issa, A. O. and Oyekunle, R. A. (2012). The use of computer based testing method for conduct of examinations at university of Ilorin. *International journal of learning and development*, 2(3), 68-80.
- Al-Adwan, A., Al-Adwan, A. and Smedley, J. (2013). Exploring Students Acceptance of E-learning Using Technology Acceptance Model in Jordanian Universities. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)*, 9 (2), 4-18.
- Al-alak, B. A. and Alnawas, I. A. M. (2011). Measuring the acceptance and adoption of e-Learning by academic staff. *Knowledge management and e-Learning: An International Journal*, 3, (2), 201-221.
- Anderson, M., 2013. Advantages and Disadvantages of Lectures in Middle University and High University. Retrieved from <http://everydaylife.globalpost.com/advantages-disadvantages-lecture-middle-high-University-15106.html>.
- Bappah, M. A. (2010). Availability and Use of Information and Communication Technology (ICT) in Six Nigerian University Library Schools. *Library Philosophy and Practice*. Retrieved from <http://unllib.unl.edu/LPP/bappah-abubakar.pdf>
- Barclays, C and Osei-Bryson, K. (2012). An analysis of students' perceptions and attitudes to online learning use in higher education in Jamaica: An extension of TAM. Retrieved from <http://www.globdev.org/files/5thannualworkshop/4%20Barclay%20Bryson%20>
- Bassey, U., Umoren, G., Akuegwu, B., Udida, L. Ntukidem, P. and Ekabua, O. (2007). Nigerian graduating students Access to E-learning technology: Implication for higher Education management. *Proceedings of the 6th International internet Education conference, (ICTlearn2007)* held in Cairo Egypt from 2-4 September 2007, 59-76.
- Bello, O.W., Ehira, D.N., Ayeni, J.K., Faruk, N., and Balogun, N. (2014). Towards the Design of a Synchronous Virtual Learning System. *Covenant Journal of Informatics and Communication Technology (CJICT)*, 2 (2), 59-74.
- Chau, Y. K., and Hu, J. H. (2001). Information technology acceptance by individual professionals: A model comparison approach. *Decision Sciences*, 32 (8), 669-719.
- Center for Open and Distance Learning-University of Ilorin. (2013). Retrieved from <http://www.uilcodl.unilorin.edu.ng/>
- Chidobi, R.U. (2015). Staff Personnel Perception on the Utilization of e-learning in Public Universities in Enugu, Nigeria. *American Research Journal of Educational Research*, 1 (1), 8-17.
- Conkova, M.. (2013). Analysis of Perceptions of Conventional and E-Learning Education in Corporate Training. *Journal of Competitiveness*, 5(4), 73-97.

- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, user acceptance of information technology. *MIS Quarterly*, 13, 318-339.
- Dongsong, Z., Zhao, J. L., Lina, Z., and Nunamaker, J. J. F. (2004). Can e-learning replace classroom learning? *Communications of the ACM*, 47(5), 75-79. <http://dx.doi.org/10.1145/986213.986216>.
- Elliot, M. T. and Fu, F. Q. (2008). Consumer Acceptance of Technology Products: The Impact of Tactical Selling Approaches, *Marketing Management Journal*, 19 (2), 48-65.
- Ellis-Behnke, R. G., Singer, D. A., Gilliland, J. and Schneider, G. E. (2005). Tablet PCs and the Paperless Classroom. *Abstracts and presentation, Syllabus Conference for Education Technology*.
- Etesike, C. N. (2008). *Harnessing ICT resources for effective implementation of UBE Scheme in Nigeria*. A conference paper presented at the 7th International Conference of National Assist for Research development. FCT College of Education.
- Fishbein, M., and Ajzen, I. (1975). *Belief, Attitude, Intention, and Behaviour: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Federal Republic of Nigeria (2004). *National Policy on Education*. Lagos: NERDC Press.
- Galagan, P. (2002). The Learning Revolution. In Woods, J.A. and Cortada, J. W. (Eds.). (2002). *The 2002 ASTD Training and Performance Yearbook*, 75-82. New York: McGraw-Hill.
- Glocacom (2016). Unilorin, Glo partner on e-learning. Available at <http://www.gloworld.com/ng/latest-news/unilorin-glo-partner-on-e-learning/>
- Hayashi, A., Chen, C., Ryan, T and Wu, J. (2008). The role of social presence and moderating role of computer self-efficacy in predicting the continuance usage of e-learning systems. *Journal of Information Systems Education*, 15 (2), 139-148.
- Hiltz, S.R., and Wellman, B. (1997). Asynchronous learning networks as a virtual classroom. *Communications of the ACM*, 40 (9), 44-49. <http://dx.doi.org/10.1145/260750.260764>.
- Lee, M. K. O., Cheung, C. M. K., and Chen, Z. (2005). Acceptance of Internet-based learning medium: The role of extrinsic and intrinsic motivation. *Information and Management*, 42, 1095–1104.
- Liaw, S. S., Huang, H. M., and Chen, G. D. (2007). Surveying instructor and learner attitudes towards e-learning. *Computers and Education*, 49, 1066-1080.
- Liverpool, L. S. O., Marut, M. J., Ndam, J. N. and Oti, D. A. (2009). Towards a model for e-learning in Nigerian HEIS: lessons from the University of Jos ICT Maths initiative. Proceedings of the ICT Conference, Obafemi Awolowo University, Ile Ife, September, 2009. Retrieved from <http://www.forum.org.ng/system/files/IFE+paper.pdf>.

- Mahdizadeh, H., Biemans, H., and Mulder, M. (2008). Determining factors of the use of e-learning environments by University teachers. *Computers and Education*, 51(1), 142–154.
- Malhotra, Y., and Galletta, D. F. (1999). Extending the technology acceptance model to account for social influence: Theoretical bases and empirical validation. Proceedings of the 32nd Hawaii International Conference on System Sciences, Maui, Hawaii, USA, 1-14. doi:10.1109/HICSS.1999.772658
- Masrom, M. (2007). “Technology Acceptance Model and E-learning”. Retrieved from http://eprints.utm.my/5482/1/MaslinMasrom2006_techn.pdf.
- Mbengo, P. (2014). E-learning Adoption by Lecturers in Selected Zimbabwe State Universities: An Application of Technology Acceptance Model. *Journal of Business Administration and Education*. ISSN 2201-2958. 6 (1), 15-33.
- Meloni, J. (2010). Tools for Synchronous and Asynchronous Classroom Discussion. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/blogs/profhacker/toolsforsynchronousasynchronousclassroom-discussion/22902>.
- Mishra, P. and Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teacher knowledge. *Teachers College Record*, 108 (6), 1017- 1054.
- Nworgu, G. B. (2006). The Indispensability of ICT in educational research. In Eze, D. N. and Nkedi, O. (Eds). *ICT in the service of education*. Enugu, TIMEX.
- Onwuagboke, B. B. C., Singh, T. K. R. and Onwuagboke J. N. (2014). Perceived Challenges to Effective ICT Integration in Teacher Education in South-Eastern Nigeria. Paper Presented at the 3rd International Conference on Leadership and Learning in the Asian Century, November 17-19, Universiti Sains Malaysia Penang, Malaysia.
- Saade, R., Nebede, F and Tan, W. (2007). Viability of the “Technology Acceptance Model” in multimedia learning environments: A comparative study. *Interdisciplinary Journal of Knowledge and Learning Objects*, 3, 175-183
- Schulz, A. and Apostopolous, N. (2009). E-assessments with students Notebooks: F.U e-examinations. Berlin. Freie Universitat.
- Solomon, D. E. (2013). The Digitized and Paperless Classroom - A foreseeable future. Retrieved from <http://thetechnologyoflearning.wordpress.com/2013/05/04/the-digitized-and-paperless-classroom-a-foreseeable-future/>
- Ssekakubo, G., Suleman, H, and Mardesn. G. (2011). Issues of Adoption: Have E-Learning Management Systems Fulfilled their Potential in Developing Countries? Retrieved from <http://pubs.cs.uct.ac.za/archive/00000712/01/p231-ssekakubo.pdf>.
- Thiagarajan, S. T. (2005). Thiagi’s - Interactive Lectures – Power up your training with interactive games exercises. Alexandria: ASTD Press.

- Venkatesh, V., Morris, M., Davis, G., and Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27 (3), 425-478.
- Wang, T. (2009). The Transformational Promise of Information and Communications Technologies (ICTs) for the Professional Education of Architects. *Educational Technology and Society*, 12 (3), 206–213.
- World Economic Forum (2013). The Africa Competitiveness Report 2013. Retrieved from http://www3.weforum.org/docs/WEF_Africa_Competitiveness_Report_2013.pdf