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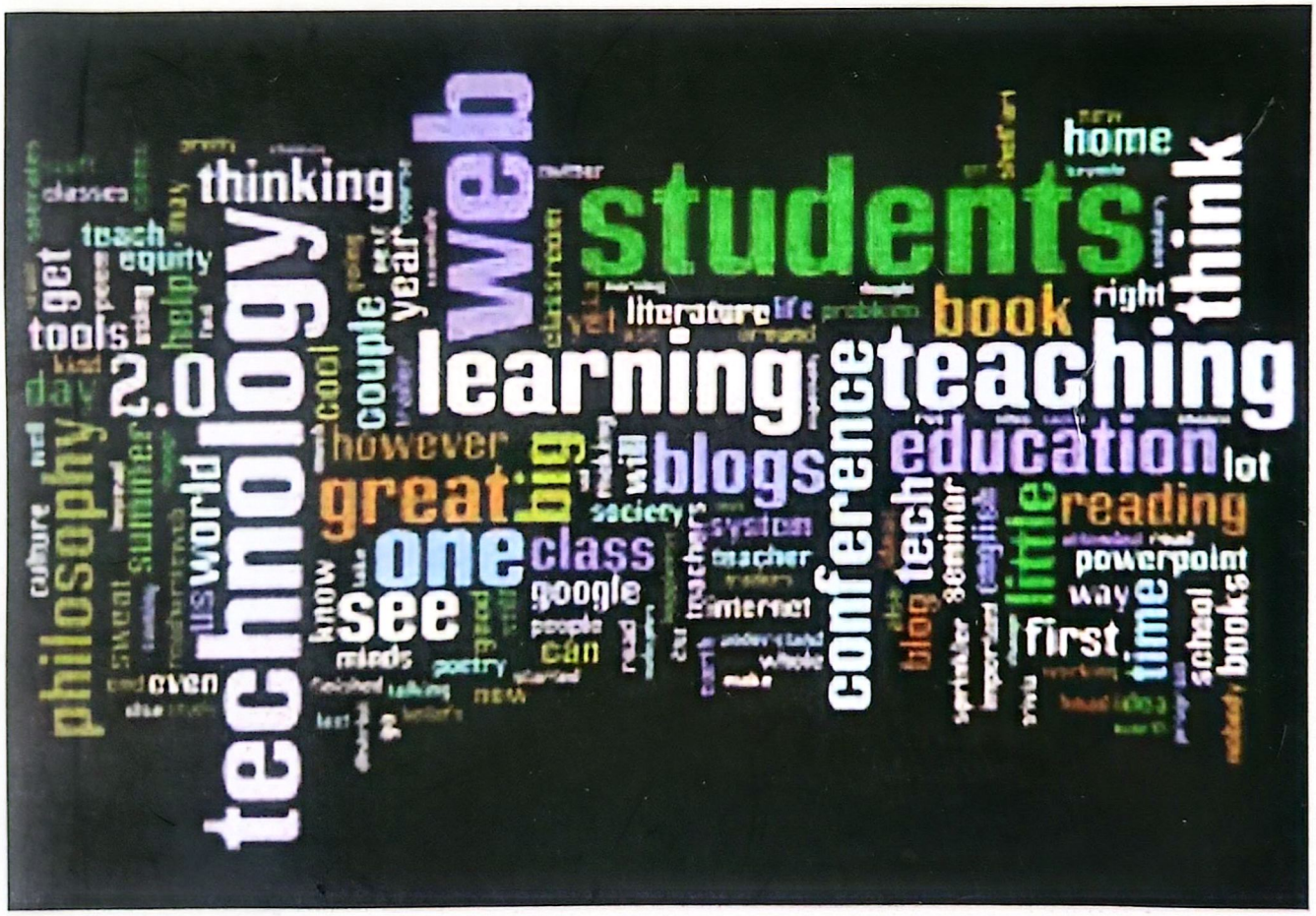

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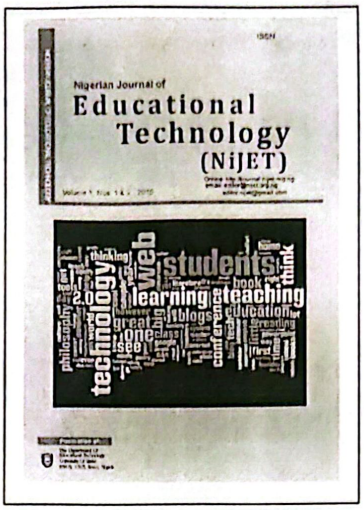

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Editorial Message



It gives me great pleasure to launch the maiden edition of this new journal, "Nigerian Journal of Educational Technology" (NIJET). The Nigerian Journal of Educational Technology (NIJET) is an institutional journal resident in the Department of Educational Technology, Faculty of Education, University of Ilorin, Ilorin, Nigeria. NIJET is a peer-reviewed bi-annual journal (June and December) on educational technology issues. The journal is devoted to presenting and discussing the emerging developments in educational technology. The objective of the journal is to publish original research, empirical and review articles to contribute to the development of educational technology field. In pursuit of this objective, the journal not only publishes high quality, peer-reviewed research papers but also ensures that the published papers achieve broad international credibility.

There are a lot of challenges in teaching and learning emanating from emerging developments in Information and Communication Technology (ICT). The application of technology is a key theme in every paper which is published in this journal. The intent of this journal is to showcase technologies which could bring about a fundamental change in achieving instructional effectiveness in academic institutions and workplaces. The first volume with two issues (volume 1, numbers 1&2) has been very carefully put together covering a range of instructional use of technologies in the domain of human computer interface, wireless technologies in synchronous and asynchronous environments. Authors of publication of the journal are responsible for their content. Credit for the content and responsibility for errors or fraud are borne equally by all authors.

I would like to appreciate all the members of the editorial board and reviewers for their courageous attempt in making this journal a possibility. We have had an overwhelming response from some eminent Editors and researchers globally to support as Editorial Team. I look forward to making this endeavour very meaningful. A very warm thanks to University of Ilorin for providing opportunity to make this journal a reality.

Professor Samuel A. ONASANYA
Editor-in-Chief,
Nigerian Journal of Educational Technology (NIJET)

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PRACTICAL ASSESSMENT OF ICT IN TEACHING AND LEARNING: CONTEXTUALIZING AN ICT IMPACT ASSESSMENT MODEL

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Abstract

Less than a decade after University of Ilorin, Nigeria launched the platform for teaching and learning with ICTs, it ranked first among Nigerian universities web popularity in 2009. Researchers took interest in this fact and decide to put an ICT impact assessment model for developing countries on ICT deployment in teaching and learning in context of the University. Using classroom observations, the 4-component model was used to assess the impacts ICTs have on lecturers' teaching and students' learning, the level of ICT integration, the incentives available to lecturers and students and the challenges that impede successful integration of ICTs in teaching and learning. These observations were used to understand the phenomenon at the University of Ilorin and recommendations were made based on the findings. The observation procedure, the contextualization of the model in the setting and the deduction of outcome from the observation are presented in this case for reference purposes.

Keywords: *Practical Assessment, ICT, Teaching and Learning, Impact Assessment Model*

Organization Background

The University of Ilorin (UNILORIN) ranked first among Nigerian universities and tertiary institutions going by the assessment of the nation's international colleges and universities web popularity ranking in 2009 (ITU, 2009). It has since been vigorously pursuing its mission to provide a world-class environment for learning and research through the Computer services and Information Technology (COMSIT) Directorate. COMSIT oversees the deployment of ICT facilities in the university and coordinates the activities of the three units (Computer Training Unit, MIS Unit and Computer Network Unit) under it for effective ICT implementation across the university.

The computer centre is the training wing for the university's ICT implementation. It conducts information technology training for staff and students at a discounted rate and for the public at reasonable prices. The training conducted by this unit includes ICT curriculum integration training for faculty members and use of software in the sciences and social sciences. Its other functions include computer maintenance, data processing, information retrieval and management (Unilorin Comsit Directorate, 2015).

The MIS unit on the other hand handles staff and student information, the staff, undergraduate and postgraduate database and portals. The activities of this unit include online application, index of courses, student registration, course registration, assigning courses to lecturers and online payment. The campus network unit however maintains support services like email services, internal networks and ensure security, less loss of data, long term project durability and sustainability. Services provided in this unit also encourage students to check their timetable, curricula online and courseware (Unilorin Comsit Directorate, 2015)

The University is stopping at nothing to ensure that its community builds a sustainable ICT workforce. This is evident in the number of on-going ICT projects and future initiatives mapped for the university like the e-library and the digital literacy curriculum. Other activities that have received considerable attention by the university include: Cyber Security seminar, Video Conferencing, University Library Services Automation, On-line SMS and life-meeting facilities. For training and content enrichment; the Computer Appreciation Certificate for undergraduates, Microsoft IT Academy, and Learning Content Development Software (LCDS) are also put in place. To facilitate the revolution,

the University is procuring additional hundreds of computers and enhanced capacity building of the University human resources (UNILORIN Bulletin, Feb., 2009).

ICT capacity building has been expanded tremendously in the University with the execution of a robust website, a seamless and sustainable Internet facility that is being extended from the campus area to the residential area. A provision in the form of helpdesk and technical staff in all faculties are also available. The officers assigned for these operations are the faculty officers, operators and emergency response team. They are in charge of academic publications, students' registration, Internet services, application software, undergraduate and postgraduate portals.

Courseware was also developed by the University for students' use and this facilitates interaction between students and lecturers. It is a faster way to post lesson notes, track students' participation, ask questions and provide feedback. Among other proposed ICT projects in the university include mobile learning, fibre optics backbone to transmit almost 100% of data, tele-presence and videoconferencing (UNILORIN, 2008). Having acknowledged the endeavour of UNILORIN in putting a massive ICT structure in place, it became imperative to assess the impact the deployed ICT facilities have on students' learning and lecturers' teaching.

Preliminary investigations conducted by this researcher revealed that no impact study has been carried out on ICT use at UNILORIN since the deployment of the campus-wide ICT initiative. Likewise a review of the university's publications (Ilorin Journal of Education (IJE) and the UNILORIN Academic Staff Publication as at 27th July, 2009) shows no evidence of any study of this nature conducted at the institution. This is however limited to the researcher's knowledge based on search from the university's publication. Hence, assessing how ICT is deployed at this university and its impact on teaching and learning is crucial. It is also essential to determine its reach on the intended users (students and lecturers) and how it can be improved to meet educational goals.

Several authors (Ololube, Ubogu & Ossai, 2007; Yusuf, 2010) have identified that Nigeria, being a developing country with an emerging thrust in technology and gradually deploying technology because of its prowess, has failed to consider evaluating the impact of technology on the system it is deployed for. Trucano (2012) also lamented about the situation in developing countries that the lack of evaluation tools and methodologies for the assessment of ICT impact on teaching and learning constitutes a limitation. In an attempt to respond to this limitation, this study thus assessed the impact of ICT in teaching and learning in UNILORIN by putting Adedokun-Shittu (2012)'s ICT impact assessment model to work.

Putting the Model in Context

The ICT impact assessment model (Adedokun-Shittu, 2012) is presented in a cyclic form to indicate the central strength all the elements in the model provide to ICT impact. Each of the elements has an individual and collective effect over the cause. They form four strong pillars for the foundation of the impact ICT will generate over teaching and learning in education. Its cyclic representation also depicts that assessment of ICT impact on teaching and learning can start from any of the four elements.

The positive effects derived from deploying ICT facilities into teaching and learning could be assessed earlier or the incentives provided in the form of training, mentoring and adequate facilities could follow. The level of usage and integration of ICT in the curriculum, assessment and pedagogy could also be measured before looking at the barriers and challenges to the limitation in the level of integration. This process could be reversed to suit the situation or the researchers' discretion. The layout of the model is illustrated in Figure 1.

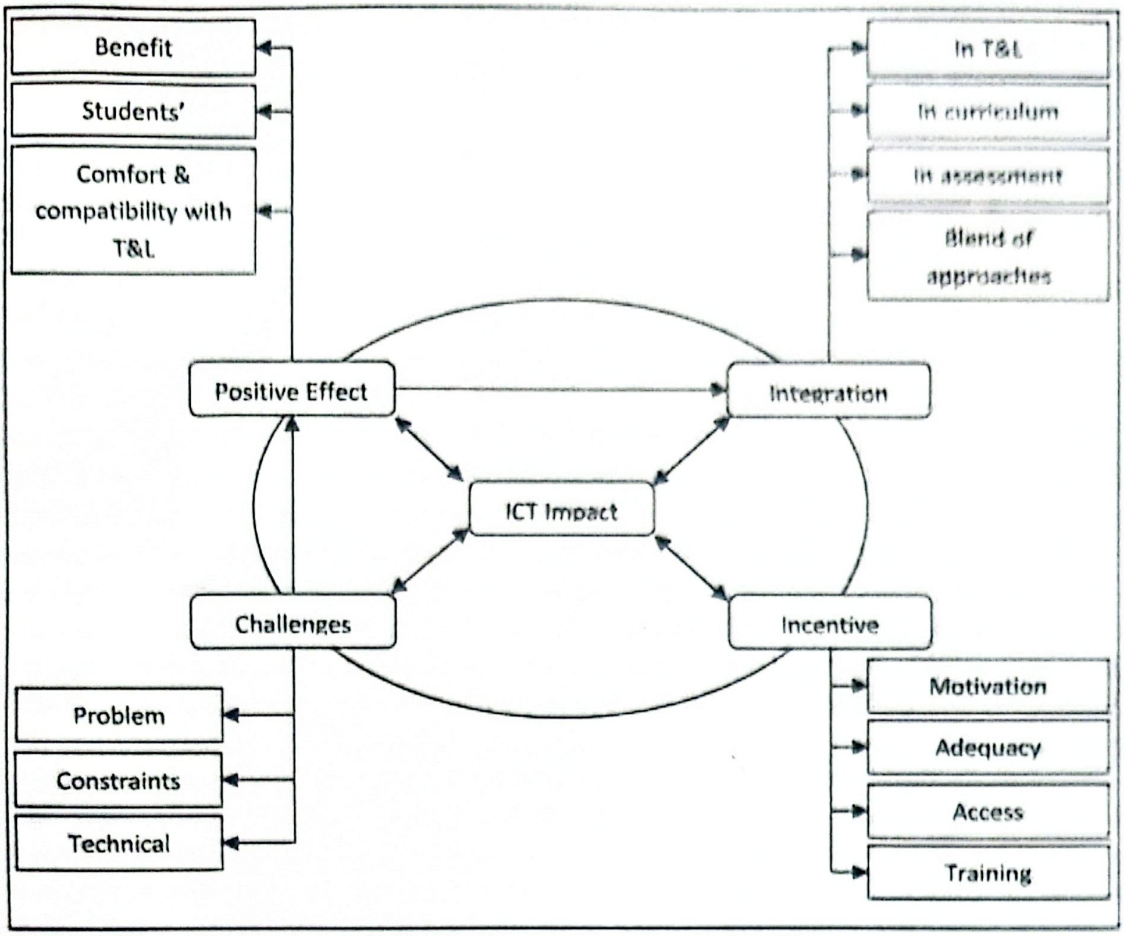

Figure 1: ICT impact assessment model (Adedokun-Shittu, 2012)

Positive effects in this model comprise benefits, students' response and ICT compatibility/comfort in teaching and learning. The benefits include; ease in teaching and learning, access to information and up to date resources, online interaction between staff and students, establishing contact with the outside world through exchange of academic work and achieving more in less time are some of the contributions of ICT to teaching and learning.

This model depicts students' response to the use of ICT as students' punctuality and regularity in class, attentiveness, high level of ICT appreciation, interactive class, students enjoy ICT-enabled classes, contribute greatly in class and prefer online assignment to offline exercises. The use of Internet to search for resources and use of software make students pleased with the product of their learning with ICT and assist their comfort level. Lecturers' proficiency in ICT skills also aid their comfort level and their ability to adapt it to their teaching needs (Adedokun-Shittu, Shittu & Adeyemo, 2013).

Authors like Rajasingham (2007), Wright, Stanford and Beedle (2007) have also found similar outcomes as positive effects of ICT in teaching and learning. Wagner,Day, James, Kozma, Miller, and Unwin (2005) categorized ICT outcomes as students' ICT skills, ICT attitudes, information skills, communication skills and lecturers' ICT, teaching and pedagogical skills. These are explained as students and lecturers' proficiency in the positive effects element of this new model.

Another component of this model is incentives and it comprises four issues that include accessibility, adequacy, training and motivation (Adedokun-Shittu & Shittu, 2015). Wagner et al. (2005) in their conceptual framework for IT listed equipment, software and network as infrastructure and they highlighted software use, equipment operation and instructional integration as required

training. They also emphasized the need for professional, administrative and technical support for teachers and students which are all part of incentives in this model.

Other researchers that have suggested these incentives as part of ICT integration issues are Yusuf (2005), Robinson (2007) and Selinger and Austin (2003). It is thus implicit that these incentives need to generate some impact to be felt in the area of integration into teaching and learning before the deployment of ICT facilities in Higher Education Institutes could be deemed productive (Adedokun-Shittu& Shittu, 2014). Hence, the fourth part of this model is integration. Some of the areas where integration is required are; ICT integration in teaching and learning, ICT integration in curriculum, ICT-based assessment, and a blend of ICT-based teaching and learning methods with the traditional method (Adedokun-Shittu, 2012). Wagner, et al. (2005) recommends that any plan for monitoring and evaluating ICT should elaborate on how ICT is integrated into the curriculum, the pedagogy, and assessment.

Challenges in this model include problems, constraints and technical issues. Among the problems are plagiarism, absenteeism and over reliance on ICT. Constrains identified especially in the Nigerian context are: large students' population, inadequate facilities and limited access in terms of working hours, insufficient buildings for the conduct of computer based exam, insufficient technical staff, no viable policy on ICT in place and epileptic power supply. The technical issues revolve around hardware, software and Internet services. Many authors such as Evans and Merhout (2004), McGill and Bax (2007), Ajayi (2002) and Abolade and Yusuf (2005) discussed some of these issues as challenges of ICT in education settings.

Challenges is a crucial part of this model, no matter how perfect an implementation is, it will definitely have some loopholes that need to be observed to achieve optimal benefit (Adedokun-Shittu, 2012). Likewise, the essence of assessment or evaluation (formative or summative) is to examine if an implementation is achieving its desired goals. Thus, to determine this, it is essential to foresee any immediate or future challenges to the successful implementation of the program.

Specifically, since this model is on ICT impact assessment and ICT is an ever evolving subject; it is appropriate to assess from time to time, the challenges, the gaps and updates needed to meet up with the developing nature of ICT required in the education system (Adedokun-Shittu, 2012). A confirmation on this could be made through the concluding words of Wright et al. (2007) study which assessed how blended model improves teachers' delivery of education curriculum. Concluding on the problems encountered by both teachers and students in the blended model, they resolved through Murphy's Law dictum thus; "... 'Anything that can go wrong will!' certainly applies to technology.... These issues of access and connection speed continue to present challenges" (p. 59).

Methodology

Classroom observations were conducted across three classes from three faculties of the University of Ilorin to see how the deployed ICT facilities are utilized and integrated in teaching and learning. To substantiate the essence of conducting an observation study in this ICT impact assessment study, reputed authors of evaluation studies are cited. Heath and Dick (2008) recommend formative approach for evaluating the effectiveness of educational technology that will incorporate more on observations of participants' actions within learning contexts. Kozma and Wagner (2005) in Wagner, et.al, (2005) also showcased how several studies on ICT impact monitoring and evaluation have employed direct observation of teaching process.

The ICT impact assessment model (Adedokun-Shittu, 2012) helped in the development of the observation protocol (Table 1) used to guide the classroom observation. It directed the researchers on what and how to observe the phenomena in the class to be able to properly assess the impact of ICT in teaching and learning in the university. The researcher-designed observation protocol used to guide the classroom observation was thoroughly developed after an elaborate review of researches that employed

observation as a data gathering technique and careful preliminary investigation of the study site.The observation protocolchecklist (Table 2) was validated by two experts on qualitative observation. The checklist contained items to look out for during the observation such as ICT facilities in the class, the ones utilized and the instructional strategy adopted by the lecturer. Others include students' reaction to the lecturers' teaching approach, student-lecturer interaction and technology interaction, their ICT proficiency and technical challenges. Field-notes and indexed video recording of the observation were made for validity purpose.

Three classes, one each from the faculties of Law, Communication and Information Sciences, and College of Medicine, were observed. All the classes were postgraduate classes because as at the time of collection of data, undergraduate students were in their exam preparation week and all their classes had been wrapped up for them to be set for the exams. Thus, postgraduate classes were chosen for observation. A Masters of Business Administration class under the Faculty of Communication and Information Sciences was first observed followed by a Masters of physiology class in the College of Medicine and lastly, a Masters class in the Faculty of Law, each with a duration of two hours.Descriptive interpretations of the class procedures are presented in sequence and the data gathered from the observation is situated under the corresponding components of the ICT impact assessment model for validity purposes.

Table 1: Observation Protocol

Issues	Sub-Issues	1st Lecture Room	2nd Lecture Room	3rd Lecture Room	Theme
Lecture Room Description	Faculty	CIS – Professional Health workers MBA	Medicine - Physiotherapy	Law	
Subject	Topic	Computer Application in Health Analysis	Gastrointestinal Secretion	Seminar Presentation	
	Content	Budgeting with Excel Spreadsheet 2007, EPI info version 6, SPSS version 15.0	Process and phases of gastrointestinal secretion, graphical representation of the pancreas	Arbitrators' Confidentiality in Nigeria	
Instructional Aids	Types	Laptop, projector, software, whiteboard as projection screen, flashdrive sized internet modem	laptop, LCD, software, PowerPoint, whiteboard, wireless internet	Textbook, laptop, Whiteboard, wireless internet	**Integration**
	Usage	70% ICT usage, 10% Setting up, 20% Teacher explanation	80% ICT usage, 20% Teacher explanation	95% oral presentation, 5% ICT usage,	
Lecturer	Teaching strategy	Blends ICT with traditional teaching, Time management strategy, Emailing for assignment submission, assessment, feedback Yahoogroups: communication, material and info sharing	Blends ICT with traditional teaching, PPT presentation slides, Moodle for assignment submission, feedback and assessment, Web Search for supportive materials and references	Traditional aided by ICT	
	ICT skill	Good	Excellent	Good	**Incentives**
	Mastery of subject	Good	Good	Good	
Students	Attitude	Noisy but participatory	Attentive and participatory	Attentive, interactive & participatory	**Positive Effects**
	Attention	On the lecturer and the LCD as directed by the her	On the PPT presentation slide and back on lecturer during explanation	On presenters, visitors, and lecturer	
	Reaction	To lecturers: interactive To contents: confused then understand after clarification To ICT: Normal to some, challenging to some, strange to some To questions: responsive, Students ask questions	To lecturers: attentive, inquisitive To contents: confused then understand after clarification To ICT: Normal, not strange To questions: responsive, challenging, interactive Students ask questions	To presenters: attentive To contents: understand, reactive To ICT: not ascertained To questions: responsive and challenging Students and lecturer critique presentation	
Technical issues	Technical Problem Technical Assistant	Yes – Initial setting up problem, slow internet connection No	Yes – power failure No	-	**Challenges**

Descriptive Interpretation of the First Lecture Room Observed.

This is a programme under the Faculty of Management Science taught by a lecturer in the Faculty of Communication and Information Sciences (CIS). The courseis specifically designed for professional health workers under Masters of Business Administration (MBA) to help them adapt the information and communication technology into their work practices. This class was chosen to be observed because it is one of the classes taught by a resource lecturer in CIS. The first 10 minutes of the 2 hours lecture between 12 pm and 2 pm on the 14th of July, 2010 was spent setting up the ICT facilities, connecting to the Internet and loading the softwares to be used.

Among the facilities used included a laptop, projector, whiteboard used as the screen for projection and a flash drive sized Internet modem used for Internet connection. As the topic (Computer Application in Health Analysis) indicates, the lecturer demonstrates how budgeting can be made by utilizing the Excel spreadsheet 2007 to make simple calculations using household examples which is really appealing to the students who are majorly housewives and breadwinners. She explains that the beauty of Excel spreadsheet in calculation is that once the formula for the problem is defined, the outcome changes automatically whenever any value is changed.

She added that the same calculation table can be done in Microsoft Word but the accuracy is higher in excel since it has to be done manually in Microsoft Word. She explained how to save, manipulate data and manage a large volume of data on Excel spreadsheet. She spent 15 minutes on this exercise during which she allowed questions and contributions from students; the session was quite interactive. She explained and compared how EPI info version 6 and SPSS version 15.0 can be used to analyze data from excel spreadsheet. She explained that EPI info is a free software on the Internet and it can be used to summarize or do a detailed analysis of statistical data. She shows the process of how data can be uploaded from the data source to the Epi Info for analyses.

Thereafter, she moved to SPSS version 15.0 for statistical analyses and compared it to Epi Info, saying that SPSS is more straightforward and it is already integrated in Windows while Epi Info was originally written for DOS and rewritten to place it in windows and not integrated in it. She also demonstrated how the statistical file can be imported into the SPSS file from the source file. Truly like she stated that SPSS is much simpler, the time it took her to figure out the Epi Info file was much longer than it took her with the SPSS even though, she stopped on file importation in Epi Info .

However, she proceeded to show how SPSS can be used to analyze the descriptive statistics using the frequency table. Afterwards, she explained that the assignment to be given will be on how to import data from excel file to SPSS from different sources and combine them for analysis. The assignment issue brought her to discussing how the students could send their assignment through the email to her for assessment and feedback. The class subscribed to a yahoogroup account where assignments are uploaded, submitted, assessed and feedback given. She briefly performed a systems specification comparison in response to students' question on how to choose a good laptop to buy.

She emphasized that the operating system and the memory of the computers is important in making a choice but external memory can be added. She adopted a time management strategy during the course of the lecture knowing well that the Internet connection is slow. Thus, she has initiated the Internet connection and navigated back and forth to connect to Yahoo homepage and sign in to the university's email account and check whether it has fully loaded or not. She wrapped up the class session by an interactive discussion with the students on the forth coming exam at 1.55p.m.

Descriptive Interpretation of the Second Lecture Room Observed

Around 10 minutes before the class time (10am – 1pm) on the 15th July, 2010, some of the students in this class (male) went to the department office to collect the ICT facilities that has been booked for use in this class. They installed the LCD and displayed the projection screen before the lecturer entered.

The lecturer's laptop was used for the lecture so he started it and opened the PowerPoint slide he has prepared for the day's lecture which is titled; "Gastrointestinal Secretion".

The PowerPoint presentation contained both text and graphics enhanced with different colours to show some of the process occurring in the stomach and specifically the gastrointestine. He also used graphical images to show the different phases of gastrointestinal secretion such as gastric phase intestinal phase and the cephalic phase. Graphics were also used to distinguish between the exocrine and the endocrine pancreas supported by textual explanation. He also used a graphical chart to show the relationships between the pancreatic juice and the irons that the juice is made up of. At this point, he asked if the students understand his explanation and a student signifies his intention to make contribution on the relationship between irons in the juice.

While the lecturer rolled the slide, he explained the graphics and the text prepared in the slide and asks questions intermittently and demands if students have questions to ask. The students responded both individually and sometimes collectively to the lecturer's questions and the lecturer corrected or confirmed their answers depending on their correctness. However some students were preoccupied with some other activities like Internet surfing and mail checking but some others were attentive and making notes. The lecturer suspended the lecture on intestinal secretion when he realized some of the students were dozing off. He gave a 20 minutes break for the students to ease off and return for the second part of the lecture.

Descriptive Interpretation of the Third Lecture Room Observed

This class was not teacher-directed; it was a seminar presentation session. Prior to this day 15th July, 2010, the lecturer had assigned topics to individual students to prepare a printed copy for presentation during the seminar and a softcopy for submission to the lecturer. Three students were scheduled to present but just two of them could make it because the review and critique from the lecturer and students took longer than anticipated. The lecturer introduced the presenter and her topic and allotted 20 minutes for her to make her presentation.

She highlighted some salient points on the issue and gave relevant examples. During her presentation, the lecturer sought some clarification on her reference to a particular point she raised and she pinpointed where the reference is in the printed copy of her presentation. There and then, the lecturer searched for the author and the link she quoted on the Internet and he confirmed the authenticity of her remark. This was the only point at which ICT facility (lecturer's laptop connected to wireless Internet) was utilized in this session.

It could be seen here that the lecturer was quite comfortable with ICT but it is difficult to ascertain the students' proficiency and comfort since they did not make use of ICT in class but from the output of their work it could be inferred that they are somewhat comfortable with ICT use. After the first presentation, the lecturer called for questions and comments from other students and he also made some comments, contributions and asked some questions. This question session lasted for about 30 minutes and the presenter reacted accordingly.

The second presenter discussed the issue of arbitrators' confidentiality in Nigeria. The procedure went the same way as the first presentation except that the lecturer referred to a textbook on "Readings in Arbitration and Conciliation" to clarify an argument that ensued among the students during the question section. The lecturer adjourned the seminar by appealing to the third presenter that her presentation cannot take place because of time

Inferences from the Observation

The first two classes observed were ICT-based while the third class was traditional complemented by ICT. Necessary ICT facilities like laptop, projector, LCD, whiteboard, projection screen, Internet were available for teaching in both classes (though they were not readily installed) except that the whiteboard

was used as the projection screen in class one and the Internet is not wireless; it is a modem enabled Internet service. This presumably caused the slow Internet connection experienced in the class but this was not an issue in the second class because it has a wireless connection. Class two though experienced a little hitch when power went off but it took just few minutes to be restored. Statistical analysis softwares (EPI info version 6, SPSS version 15.0 and Microsoft Excel spreadsheet 2007) were used in the first class but Microsoft PowerPoint 2007 was used in the second class.

Lecturers and students in both classes used ICT proficiently and comfortably in teaching and learning except for a few students in the first class who are not proficient in ICT use yet. Though ICT access in these classes gave room to two students in class two who were preoccupied with other activities like Internet surfing and emailchecking. Even with the use of ICT in these two classes, the sessions were still interactive and participatory. Class three was more of interactive and participatory because it is traditional in nature but an element of ICT was added when the lecturer searched the Internet to confirm a reference cited by one of the students.

The ICT facilities available in the class were the lecturer's and some of the students' laptop and wireless Internet. The lecturer was quite proficient in ICT use but it was difficult to ascertain the students' proficiency and comfortability since they did not make use of ICT in class. However, it could be inferred from the output of their work that they utilize ICT. Going by this analysis, it could be concluded that the Faculty of Communication and Information Sciences and the College of Medicine are ahead of the Faculty of Law in terms of ICT integration in teaching and learning. It could however be gleaned from the observation that the first two class sessions were teacher-centered despite the high level of ICT integration, while the last class session was observed to be student-centered even though it was more of traditional mode complemented with ICT.

To validate the observation of the teaching and learning process in the University, situating the outcome of the observation under the four components of the ICT impact assessment model - positive effects, challenges, incentives and integration is required. It was observed that both formal and informal students and lecturer interaction was present in the classes which is one of the positive effects identified. Slow Internet connection, power outage, inadequacy of facilities and distractions as a result of ICT access were some of the challenges encountered in the classes observed. This is consistent with some of the challenges described in the model. This is also consistent with the submission of Ajayi (2002) and Yusuf (2005) on the problems of ICT integration in teaching and learning in Nigerian Higher education.

Some of the incentives noticed in the observation include availability of Internet service, software and other facilities, good ICT skills of both students and lecturers, and students' participation as motivation. These are perfectly in line with the incentives identified in the model. All these submissions are also in line with King et al. (2007).

Lastly, ICT integration was seen in form of a blend of approach during the observation though it varied from faculty to faculty. This is practically consistent with what obtains in the classroom observations conducted across subjects (Mathematics and Science) in Adedokun-Shittuand Shittu (2011). They observed that classroom instruction is a combination of traditional and conventional ICT-enabled teaching. This is also in line with Collis and Moonen (2001) when they substantiated that ICT has clearly become part of the blend, serving as a complement to already existing instructional tools. It was thus ascertained that Computer, Science and Medical Faculties experience a higher level of ICT integration than the Faculty of Law. Even though one form of integration or the other exists across all faculties in the University; it is ascertained that ICT integration does not replace the traditional practice in the classroom; it only improves teaching and learning practices. This is consistent with Adedokun-Shittu and Shittu's (2011) submission that technology alone cannot do the trick but with an interconnected system in place.

Current Challenges

Having deduced the positive effects, incentives, integration and challenges of ICT in the University through the observation conducted, issues on how to maintain and improve the benefits and incentives while resolving the ICT integration challenges arise. An important issue identified is the fact that access to ICT facilities vary from one department or faculty to another within the University. Specifically, Medical and Science faculties have better access and utilize ICTs than other faculties. This situation needs to be fixed such that access is uniform and serves as an incentive and not as a deterrent to ICT integration. In line with this recommendation, Robinson (2007) asserts that a requisite for technology integration is provision of access to all, noting that integration is unlikely to happen in a situation where access is restricted to specific classrooms.

Regardless of the availability of ICT facilities in the University, adequacy of the facilities is also a critical incentive for usage and maximization of the benefits that are integral to ICT in teaching and learning. Training is also recognized as an essential incentive for a proper ICT integration in teaching and learning. Selinger and Austin (2003) indicate that the level of training, mentoring and

professional development teachers receive will determine the extent to which they will integrate ICTs in their teaching and students' learning. Yusuf (2005) also stressed the need for quality professional development programmes for pre-service and serving teachers, for proper technology integration to take place in teaching and learning. King, et al. (2007) described personal satisfaction and students' learning as part of intrinsic motivation while a combination of indirect and direct compensations serve as extrinsic motivation. Similarly, Adedokun-Shittu (2012) described personal achievement with the use of ICT in students' academic sojourn, students' marketability, success stories achieved through teaching and learning with ICT as internal motivation. She regarded incentives like accessibility, adequacy and training opportunities, and the university's continued effort to procure more ICT facilities as external motivators for ICT use in teaching and learning. These are all incentives that are needed to generate impact to be felt in the area of integration into teaching and learning before the deployment of ICT facilities in the University of Ilorin could be deemed productive.

It was also noted in Adedokun-Shittu (2015)'s study that the areas where ICT integration should reflect in a learning institution include: teaching and learning; curriculum; assessment; and a blend of ICT-based teaching and learning methods with the traditional method. However, from the observation in this study, the form of ICT integration that took place in the University is more of individual lecturers engaging students in informal and online interaction through social networks like Yahoogroup and email. Some lecturers also make improvisations in class to provide students with relevant and updated information and resources. An element of ICT-based assessment was also inferred from the observation in terms of online assessment and feedback through social networks. This study indicates that there exist some form of traditional-based teaching and learning method in the University despite the lecturers' and students' comfort with ICT-based teaching and learning. Student respondents in McGill and Bax (2007) also identified practical demonstrations, class discussion and other real-life applications, use of videos and multimedia within lectures as useful for their learning.

Despite all the edges ICT-based teaching and learning has over the traditional method, it is still assumed that 100% ICT-based teaching and learning should not be an option. A complementary approach based on course peculiarity is suggested for effective teaching and learning. Several authors (Adedokun-Shittu & Shittu, 2011; Lajbcygier & Spratt, 2007; McGill & Bax, 2007; UNESCO, 2005) support this integrated approach or blended learning that enhances student learning and provide a degree of flexibility. They agree that the ICT-based approach should not replace the traditional method. Rather it should complement each other and harness their benefits to improve student learning. It was also resolved by UNESCO (2005) that, for technology in teaching to be more effective especially in

developing countries, ICTs should be combined with more traditional technologies such as books and radios, and be more extensively applied to the training of teachers.

Summarily, this study suggests based on the observation that access in terms of ICT facilities in laboratories and classes, working hours, infrastructures and buildings for the conduct of computer based exam, upgraded and updated software, technical staff, viable policy on ICT and consistent Internet and power supply are required for a sustainable ICT integration in teaching and learning in the university. Likewise, training on how to use ICT facilities in teaching and learning and how to integrate it into the curriculum is essential for students and especially lecturers.

This study and other studies on ICT integration in Nigerian education system have found that insufficient training is a critical impediment to successful integration. Prominent among the problems encountered in the university's ICT integration in teaching and learning is power failure, internet inadequacy and less technical support. As such, administrators should ensure that the situation of ICT in the university be reviewed periodically in order to sustain the integration, address some of the implementation gaps and correct any problem encountered with ICT use in the system.

Overall, government should ensure that a deliberate and sustainable ICT policy is put in place to coordinate ICT implementation across educational system in the country. To curriculum designers, harmonizing between the old curriculum and the newly introduced ICT-enabled education system is a task they must accomplish. This requires that they conduct a needs assessment to look into teachers and students needs for the new curriculum to be integrative and acceptable by the primary users. Finally, the ICT impact assessment model employed in this study emphasized that no matter how perfect an implementation is, it will definitely have some loopholes that need to be observed to achieve optimal benefit.

Likewise the essence of assessment or evaluation (formative or summative) is to examine if an implementation is achieving its desired goals. Thus to determine this, it is essential to foresee any immediate or future challenges to the successful implementation of the program. Specifically since ICT is an ever evolving subject; it is appropriate to from time to time assess the challenges, gap and update needed to meet up with the developing nature of ICT required in the education system.

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Appendix

Observation Checklist

Resources/Issues	Comment	Lecturer	Comment	Students	Comment
ICT facilities available		Instructional Strategy Adopted		Students' reaction to instructional resources	
Technology integration		Teaching Approach		Students' reaction to lecturers' approach	
Utilized resources		Lecturer-student interaction		Student-Lecturer interaction	
Under-utilized resources		Lecturer-technology interaction		Student-technology interaction	
Technical issues		Lecturers' proficiency and comfort level with ICTs		Students' proficiency and comfort level with ICTs	
Intervention to technical issues		Lecturers' technical skills		Students' technical skills	
Teaching strategy		Teacher-centred		Student-centered	

LEARNING STYLES IN THE CLASSROOM THROUGH MULTIMEDIA APPROACH

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Abstract

Poor students' academic performance in Nigeria had been a major challenge to educators and educational organizations in Nigeria. It is obvious that the effort of teachers to teach and learners to learn without putting different student learning styles into consideration makes the teaching and learning activities yield less or no result. The fact remains that the way students learn varies and sometimes it is difficult for teachers to adopt all learning styles for the various learners in the classroom especially when they are many. Doing this will not make teaching and learning activities effective and efficient. Therefore, this paper examined the learning styles concept, nature of multimedia, multimedia approach to different learning styles, and the blending of multimedia approach to accommodate different learning styles in teaching and learning process in the classroom. Conclusively, this paper recommend that teachers need to be versatile on how to use different educational media through specialize training in other to meet the demand of various learners by exploring their different learning styles.

Keywords: *Learning Preference, Media, Multimedia, Teaching, Learning*

Introduction

Agulanna and Nwachukwu (2009) defines learning styles as the preferred ways that different individuals have for processing and organizing information and for responding to environmental stimuli. The term multimedia is a presentation of information that incorporate multiple media such as text, audio, graphics, and animation. Rose and Meyer (2002) education sector in Nigeria has failed in their responsibility of adding value and excellence to education in Nigeria. Instead of the standard of education to experience growth, reverse is the case. The rate of failure in examination is unimaginable and the best alternative for student nowadays is examination malpractice. The standard of education in Nigeria is indirectly proportionate to high rate of failure and examination malpractices. The major reasons for this are, poor teaching method, incompetent teachers, poor learning attitude on the part of learners, lack of instructional resources, and so on. All strategies employed to counter this ugly trend of examination malpractice has been fruitless. In other to surmount this problem, this paper elucidates how multimedia approach can be used in addressing major learning styles in the classroom. Implementation strategies and recommendations are also examined.

The present day classroom has become a playground for learners because teacher has nothing to offer them, all their teaching method has been exhausted and they are so wearied and frustrated on how knowledge can be imparted to the learners. Even when the teacher attempt to teach, the morale of the learners is very low due to the fact that the teacher's method and approach do not appeal to learners anymore. Matthews (1995) cited in Renou (2011) pointed out that educators have realized that individuals learn differently and one concept that could attest to the differences in students' motivation and students' academic achievement is learning styles. This paper discusses how multimedia approach can be explored in accommodating different learning styles in the classroom.

Concept of Learning Styles

Learning or cognitive style refers to the usual manner in which a learner learn a particular task in his or her own way. Agulanna and Nwachukwu (2009) defined learning styles as the ways different individuals process and organize information and ways they respond to environmental stimuli. They noted that learning styles do not reflect intelligence or patterns or abilities but may influence students' learning in school. In other words, adapting learning to learner's learning styles brings into play learner's intelligence. Negatively put, a child may look stupid or unintelligent in the classroom because the teacher's instructional method does not interest or suit learner's learning style.

Learning styles are vast and complex. The question then is whether it is possible to accommodate them in the classroom since it is believed that each learner learns in a different way. What if there are 40 students in the class does it means that teacher must have 40 learning styles? Confirming the above statement about complexity and ambiguity of learning styles, Renon, (2011) based on the synthesis of the ideas of Kinsella (1995), Reid, (1995); and Turton (2001) noted that disparity on how researchers categorize, define, group, and measure learning styles is both complicated and, at times divided. There seems to be controversy on the nature and etiology of learning styles, whether they are fixed or can change. Renou (2011) also cited a survey by Hall and Moseley (2005) stated that there is strong relationship among the influence of genetics, inherited traits, and the interaction and environmental factors such as cooperative and individual learning.

Felder (1993) cited in Agulanna and Nwachukwu (2009) affirmed that "students preferentially take in and process data in different ways such as by seeing and learning, reflecting and acting, reasoning logically and intuitively, analyzing and visualizing, steadily and in fits and starts; whichever is used mostly and consistently by a student is his own preferred learning styles" (p. 28). From the above statement, one can deduce that a student may learn intermittently through other learning styles the student prefers and that helps him learn better. In other words, if an instructional method does not appeal to learners' preferred styles; meaningful learning may not take place, and this attests to the imperativeness of adapting learning to the students' preferred learning styles.

It is pertinent that students learning styles be accommodated in the classroom but those differences do not end in the classroom but extend to the society. According to Agulanna and Nwachukwu (2009), students' learning styles do add spice and vitality to the world. As Basset (2004) noted in Agulanna and Nwanchukwu (2009) without these varieties, the world would be such without any unique contribution to the society, with all humans wearing the same face: so maintaining the varieties in the classroom will ensure a world of varieties. Variety they said is the spice of life.

Multimedia in Teaching and Learning

Abdulahi, (2013) opined that multimedia refer to the use of variety of instructional materials such as audio tapes, slides, transparencies, filmstrip, motion pictures, still pictures, animation and text in a single presentation. To make it simpler, multimedia means a combination of media for communicating information to students. Multimedia can be used in subject all subject areas (art, sciences, and social sciences). For example, in the sciences the materials may consist of microscope slides, specimens and some simple chemicals for experiment. The multimedia principle is simple and straightforward, people learn better from words and pictures than from words alone. Sure, there are exceptions to multimedia principle, such as expert learners may not need as much multimedia enrichment than novices, but the principles can be used by instructors to guide the design and presentation of instruction (Schroeder, 2010)

There are some instructional materials that are originally designed to control the process of presentation, and students are assigned a rather passive role as receivers of information. There are other educational materials such as multimedia that are interactive in the sense that students are assigned an active role where they can select topics and jump between these. The main purpose of using multimedia

in education is therefore to make the student active rather than passive in the process of learning. In other words, the use of multimedia by teacher will simulate active participation and encourage the students in individualized multisensory learning. Not only being actively involved in learning, the students will also be highly motivated to the extent of making learning to be exciting and enjoyable. It is believed that multimedia utilization is consistent with the view of learning as knowledge construction (Abdulahi, 2013).

Education is defined as a means of providing systematic training and instruction. In training and instruction multimedia are powerful tool which can provide individual interactive instructions as well as motivation for practice in an entertaining environment. Multimedia also provide students with different learning styles, the opportunity to learn, share, communicate and grow using all their faculties (Abdulahi, 1995).

Different Ways of Using Multimedia in Teaching and Learning Process

Linear Educational Sources: The use of linear multimedia regards the students' reception of the content of linear multimedia materials. These lead the students through tasks in sequence. The students can pick the event they want. However, once the potential useful sources have been located, the students have very limited control over the narration (Abdulahi, 2013).

Hypertext-based Materials: The use of hypertext-based educational materials encompasses the students' reception of the content of non-sequential multimedia materials. These non-sequential narratives encompass hypertext based, interactive CD-ROMs and internet services and they are often used as information providers. No guidance is offered through the different sections leaving the student as an explorer (Abdulahi, 2013).

Supervising Products: The use of multimedia tutoring materials regards the students' reception of the content of multimedia materials display various guides for the student and help them breakdown and structure different tasks. This type of products typically consist of a kind of tutoring strategy, for example, knowledge about a subject matter and about instruction, often presented in drill-and-practice sessions and a critiquing strategy. For example, provision of feedback tailored to the particular needs of each student helping her/him confirm hypotheses and refine proposals (Abdulahi, 2013).

Tools and Ingredients: The use of multimedia productive tools covers the students as authors and producers. This scenario regards production of their own multimedia presentations by means of proper multimedia element to be used by the students to produce multimedia in the class room and the proper (Abdulahi, 2013).

Tips for Accommodating Major Learning Styles through Multimedia Approach

All students have a way in which they best learn,every student in the class has a different preferred learning style, which can make it difficult for the teacher to be effective teacher. However, by trying to incorporate various methods into your teaching, you may be able to reach the majority of your students. At the higher institution level, it is expected that students have an idea of how to adapt to most teachers, although it cannot hurt to help them out a little.Using Neil Fleming's acronym VARK, students can be classified based on preferred learning modes into: Visual (V), Auditory (A), Reading/writing preference (R), and Kinesthetic (K) learners.

Visual: Visual preference learners prefer use of images, maps, diagrams, demonstration, displays, handouts, films, flip chart, and other visuals to understand new information. Student with visual learning style has a preference for seen or observed things. These people will use phrases such as 'show me 'let's have a look at that' These are the people who will work from lists and written directions and instructions. Visual learners can be accommodated by using maps, flow charts, or webs, checklist of needed formula, flash card, pictures or cartoon of concept, chalkboard and computers(Fleming, & Baume, 2006; Victoria & Alan 2005).

Auditory: Students with auditory learning styles have preference for transfer of information through listening to the spoken word, of self or others, of sounds and noises. They understand instructional contents through listening and speaking in lectures or group discussion, and they also use repetition as study technique. They use phrases such as 'tell me', 'let's talk it over', and will be best able to perform a new task after listening to instructions from an expert, happy being given spoken instructions over the telephone, and can remember all the word to songs that they hear. Auditory learners can be accommodated by engaging student in conversation about the subject matter, by questioning and summarizing materials, exploring tape lectures, reading materials aloud using talking calculator, putting materials to a rhythm or tune and rehearse it aloud (Fleming, & Baume, 2006; Victoria & Alan 2005).

Reading/writing: These are learners who are note takers and avid readers who can translate abstract concepts into words and essays. Students with this learning preference emphasizes text-based input and output-reading and writing in all its forms. They addicted to PowerPoint presentation, the Internet, dictionaries, quotations, and words (Fleming, nd.,Fleming, & Baume, 2006).

Kinesthetic or Tactile: Students with kinesthetic learning style have preference for physical experience such as touching, feeling, holding, doing practical hands-on experiences. These hand-on learners figure things out by hand information through tactile representation of information. They use phrases such as 'let me try it', 'how do you feel?' and will be best able to perform a new task by going ahead and trying it out. These are the students who like to experiment, hands-on and never look at instruction first. Kinesthetic learning styles can be accommodated by using checklists, trace words and diagrams, role play and drama, body movement (snapping fingers, pacing, mouthing ideas) while learning (Fleming, & Baume, 2006; Victoria,& Alan, 2005).

The diversified nature of multimedia makes it suitable for accommodating different learning styles in the classroom. There are many items in multimedia as there are many styles. Items like transparences, slide/filmstrips, still picture appeal to the visual learners. Items like audiotapes, recorders appeal to auditory learning and items like real objects appeal to tactile learner. Study prints and other printed media appeal to reading/writingpreference learners.Other latent learning styles are also indirectly accommodated. This is because within learning styles there are differences inthe component that make up each one. For example, the category of perceptual learning styles according to Renou (2011) is composed of visuals, tactile and kinesthetic. Kinesthetic/psychomotor, visual and spartial and auditory/verbal. Keefe (1979) in Renou (2011) gave his component as visual and haptic which is a combination of tactile and kinesthetic. James and Galbraith (1985) in Renou (2011) included print visual and interactive (verbalization and olfactory). Finally, Reid's (1995) in Renou (2011) noted that perceptual learning includes visual, auditory, tactile, kinesthetic/group and individual learning styles.

Merit of Multimedia in Teaching Different learning styles

Akude (2005) cited in Ifegbo (2008) opined that educational technology materials or educational media were therefore considered as the quickest and most systematic way of making education relevant and meaningful to the learners. Also, Kemp (1980) as sited by Ifegbo (2008) identified the following as the advantages of multimedia.Multimedia when effectively selected and utilized, help in attaining a better understanding of the concept taught, the learner using multimedia technique to instruction gain more learning experiences. Media simulate and sustain the pupils' interest to learn because they engaged more than one sense organ in the cause of teaching and learning, and multimedia can demand attention and create strong emotional impact on viewers through the use of photographs, slides, filmstrip and recording in combination of self-paced learning.

Media-mix help the learner to consolidate what is learnt. Pupils exposed to media acquire concrete experience and the amount of factual learning increases, learner appreciate what teacher teaches and perform better. With multimedia systems the students are provided with immediate feedback and their performance monitored. Taking care of the individual differences in learning is very

important, multimedia systems could be designed to suit the individual differences and learning preferences.

Factors Inhibiting Useof Multimedia in Teaching and Learning

Requirement for computer equipment could bring a problem; there may be need for using loud speakers, DVD, CD-ROM players, and so on.The computer and its components and equipment are very expensive.Working with interactive system could be very complex and difficult and there is the problem of compatibility between the computers which makes some computers not to accept materials from other computers (Abdulahi, 2013).

Conclusion

In spite of the inhibiting factors in the use of multimedia, the idea of multimedia implies that a variety of resources abound from which a teacher could choose to facilitate instructional delivery.Instructional media can be explored to meet the needs of different categories of learnerssuch as visual learners,auditory learners and kinesthetic learners. Audio-visual resources are more powerful than either audio or visual aids because they combine the qualities and affect both senses of sight and hearing. When multimedia is used appropriately to accommodate different learning styles, there will be improvement in academic performance of the learner.

Recommendations

Teachers should be familiar with various learning styles with a view to accommodating them in the classroom.Due to different use of multimedia simultaneously, in other to ensure efficiency and effectiveness, care must be taken in the use of various media.Teachers and teacher educators need to be well trained in the use of instructional media and hypermedia. Giving the importance of multimedia instructional method in contemporary education, the methods of integrating media in instruction should be properly taught to student teachers. Students should be assisted to identify their learning styles as the teacher uses multimedia. Evaluation must accommodate the different learning styles as the teacher uses multimedia instructional resources.

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CHALLENGES FACING UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN SPORTS ADMINISTRATION IN NIGERIA

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Abstract

This study investigated challenges facing utilization of information and communication technology among Sports Administrators in Nigeria.A sample of 780 respondents who are staff of the National Sports Commission (NSC) Abuja, Nigeria and the 12 NSC zonal offices in the six geo-political zones of Nigeria,were selected using multi stage sampling technique. A structured questionnaire developed and validated by the researchers was used to collect data for the study. Descriptive statistics and Pearson's Product Moment Correlation were used to describe the demographic data as well as test the hypothesis at 0.05 level of significance.The result revealed significant relationship between challenges and utilization of Information and Communication Technology among Sports Administrators in Nigeria. Based on the findings of this study, it was recommended that alternative sources of power such as solar should be provided to power the ICT facilities and SAs should be trained and retrained in the utilization of ICT facilities to assist them in functioning optimally in the digital world in order to keep abreast of latest happenings in their sports.

Keywords: *Challenges, Information and Communication Technology, National Sports Commission and Utilization*

Introduction

Information and Communication and Technology (ICT) refers to the tools used in the collection, collation, organization, manipulation and drawing of inferences on data as well as exchange of information between and among people from one geographical location to another. Rosandich (2014) stated that the currency in this new society is information and the medium of exchange is called information and communication technology. It is simply the tools and methods used for identification, organization and manipulation of facts that we call data. He stated further that ICT has become the engine that is driving all sectors of today's economy be it industry, government, education and sports.

The evolution of ICT in every sphere of human endeavour including sports has brought hardware and software which have made work place experience easier and worthwhile. Nhamo and Magonde (2013) observed that most professional sports in the United States of America and other developed nations now make extensive use of ICT in administration, coaching and officiating which have revolutionized and enhanced the standard and status of their sports.

The researchers observed that challenges militating against the utilization of ICT in sports administration in Nigeria include lack of ICT skills by sport administrators, erratic power supply/lack of standby generator, fluctuation of server/congestion, inadequate ICT personnel to assist in training sport administrators in the use of ICT and high cost of procurement, maintenance of hardware and connection to internet. Therefore, there is urgent need for the training and retraining of personnel and other staff that are connected with the handling of the ICT infrastructures in the utilization of ICT in

sports administration, both in theory and practical for maximum utilization and maintenance of the ICT facilities. Agere (2013) discovered obsolete computers and power outages, lack of qualification in ICT skills as a major challenge facing ICT in Zimbabwe. Adomi (2006) was of the opinion that electricity failure has been persistent problem militating against ICT application and use at the NSC. Okiy (2006) reported that a number of obstacles have been identified that are militating against utilization of ICT facilities among sport administrators in Nigeria. These include inadequate funding, inadequate power supply, acute shortage of competent manpower for information technology operation and maintenance, lukewarm attitude of the Nigerian government towards the development of ICT facilities.

The issue and problems mostly related to the economic aspect, costs, attitude of sport administrators towards the use of ICT, quality information and on the issue of commercialization. Adomi (2006) reported high cost of computer and other ICT facilities as one of the factors challenging the provision and utilization of ICT by sport administrators in Nigeria. From Nigerians perspective, Ehikhamenor (2002) in a study of Nigerian print media reported that some socio-economic and political factors limit the adoption and use of ICT which include high rate of inflation, unfavourable exchange rate, low wage level, inadequate funding, low gross national product and political instability. Brakel and Chinsenge (2003) stated that monthly internet rates are exorbitant and the charges for satellites, televisions are unaffordable for most people in Africa and this serves as a barrier to procurement of ICT facilities in sport administration in Nigeria. The researcher observed that funds to procure ICT facilities by the NSC Management is one of the problems confronted by the sports administrators that have militated against efforts at making the NSC ICT driven. The NSC depends mostly on government for funding and corporate bodies through donations and philanthropic gestures in developing available ICT infrastructure in NSC.

Therefore, in making sport administrators ICT compliant, the attitude of government management of NSC must change to ensure that all offices of the NSC are equipped with relevant ICT and coaches provided with latest ICT in their sport to solve the problem challenging the utilization of ICT by sports administrators in Nigerian. Thus, the purpose of the study was to determine the challenges facing utilization of information and communication technology in sports administration in Nigeria.

Research Question

One research was raised to elicit solution to the problem of this study.

1. Are there challenges faced by sport administrators in the utilization of ICT in sport administration?

Hypotheses

One hypothesis was generated and it was tested at $P < 0.05$, thus

1. There will be no significant relationship between utilization of ICT and challenges faced by sports administrators in Nigeria.

Methodology

Research Design: The design of the study was the descriptive cross-sectional survey research. The use of the design was hinged on the fact that it is suitable for gathering data from a relatively large number of cases at a particular time.

Sample and Sampling Technique: The population for this study consisted of all the 1144 personnel at the National Sports Commission located in Abuja and 12 zones created to ease the administration of sports in Nigeria. The zones are South West with one in Ibadan and two in Akure, South East with one in Enugu and two in Umuahia, North East with one in Bauchi and two in Damaturu, North Central with one in Jos and two in Minna, South South with One in Benin City and two in Port Harcourt, and North West with one in Kaduna and two in Sokoto.

Multi stage sampling technique according to Battaglia (2008) is sampling technique in which sampling is done in stages sequentially across hierarchical levels was used for the study.

First, purposive sampling technique was used to select National Sports Commission, Abuja and all the 12 NSC zonal offices in the six Geo-political Zones of Nigeria. Second, proportionate sampling technique was used to select 50% of the 12 NSC zonal offices which equals six which means one office was chosen out of the two offices in each geo-political zone and 68.2% of staff at the headquarters and the six zonal offices made up of Directors, Deputy Directors Organizing Secretaries, Coaches and Sports Officers were selected for the study. Finally, simple random sampling technique was used to select 780 respondents representing 68.2% of the entire population.

Research Instrument: The research instrument used to gather data for the study was a questionnaire tagged 'Sports Administrator Questionnaire' (SAQ) designed by the researchers and it consisted of two sections. The first part dealt with socio-demographic variables of respondents, while the second part contains items on utilization of ICT.

Procedure for Data Collection: The researchers personally administered the questionnaire copies on the respondents. After their consents had been received, each respondent responded to the questionnaire independently. Respondents' responses were regarded as reflecting current status of availability and utilization of ICT at the NSC. It was assumed that all responses given by the participants were frank and sincere. It is relevant to add that the researchers were former athletes, sports administrators and academics and hence had little or no difficulty in interacting with the sports administrators at NSC.

Data Analysis Technique: The data collected were analyzed using descriptive and inferential statistics. The descriptive statistics included percentages, frequency counts, while inferential statistics of Pearson's Product Moment Correlation (PPMC) was employed to test the hypothesis formulated for the study, at 0.05 level of significance.

Results

Research Question: Are there challenges faced by sport administrators in the utilization of ICT in sport administration?

In answering Research Question, data generated from responses on challenges of ICT were analyzed using frequency counts and simple percentages and the result is presented in Table 1.

Table 1:
Percentage Response of Respondents on Challenges of Utilization of ICT

		SA	%	A	%	D	%	SD	%
1	Lack of access to ICT facilities/Digital divide	144	18.5	392	50.3	156	20.0	88	11.3
2	Lack of adequate ICT skills	160	20.5	384	49.2	160	20.5	76	9.7
3	Lack of funds from government	232	29.7	360	46.2	120	15.4	68	8.7
4	Erratic power supply/ Lack of a standby generator	212	27.2	356	45.6	140	17.9	72	9.2
5	Lack of technical support from international federations	204	26.2	384	49.2	152	19.5	40	5.1
6	Fluctuation of ICT server/congestion	212	27.2	352	45.1	124	15.9	92	11.8
7	Inadequate ICT personnel to assist in terms of training SAs in the utilization of ICT	240	30.8	344	44.1	136	17.4	60	7.7
8	Lack of maintenance culture	268	34.4	280	35.9	144	18.5	88	11.3
9	High costs of procurement of hardware and software	264	33.4	316	40.5	128	16.4	72	9.2

10	High cost of connection to Internet	376	48.2	336	43.1	52	6.7	16	2.1

Respondents' responses from Table 1 agreed with most of the items on the challenges facing the utilization of ICT by sport administrators in Nigeria.These include lack of access to ICT facilities, digital divide, lack of adequate ICT skills, erratic power supply and so on.The responses above also indicate that the respondents did not show absolute agreement as indicated in the report of the responses. For instance, over 30% disagreed with 1 and 2, and over a quarter (25%) disagreed with 4, 5, 6, 8 and 9. Therefore, present the figure for the results.

Hypothesis

There is no significant relationship between utilization ICT and challenges faced by sports administrators.

In testing the hypothesis, relationship between challenges and utilization of ICT was determined using PPMC. The result is as presented on Table 2.

Table 2: **Pearson's Product Moment Correlation between Challenges and Utilization of ICT by SAs in Nigeria.**

Variable	Mean	SD	N	df	r	Sig(2-tailed)
ICT challenges	29.56	5.54	780	779	0.57	.000*
Utilization of ICT facilities	54.67	11.11	780			

*P< 0.05

Table 2 shows the relationship between challenges and utilization of ICT facilities by sports administrators in Nigeria (r= 0.57, p=.000). This denotes that the null hypothesis was significant and therefore rejected. This implied a significant positive relationship between challenges and utilization of ICT facilities by sports administrators in Nigeria.

Discussion

The findings of this study revealed that lack of access to ICT facilities and lack of funds from government as challenges facing utilization of ICT. The NSC is a government owned ministry and as such should be provided with the wherewithal and necessary support to provide ICT which will enable SAs access information geographical location notwithstanding. Access to ICT can depend greatly on financial status, geographical location and government policy (McCollum, 2011). Nigerian government need to invest huge financial resources to achieve internet access for SAs in order to bridge the digital divide. McCollum (2011) stated further that the United States invested billions of dollars to provide internet services for her citizens. This finding was also supported by Okiy (2006) who found lukewarm attitude of the Nigerian government towards the development of ICT as a challenge to utilization of ICT among sport administrators.

Findings of this study revealed that lack of adequate ICT skills, erratic power supply and inadequate ICT personnel to assist in terms of training SAs in the utilization of ICT posed challenges to the utilization of ICT. This was consistent with Adebo, Adekunmi and Daramola (2013) who found power outage, lack of computer skills, lack of skilled manpower and financial constraints as significant challenges of ICT. This implies that the constraints could predict the level of use of ICT by sport administrators since most of the ICT facilities depend on power supply for operation.

This study also found high cost of connection to Internet, high cost of procurement and maintenance of hardware and software to hinder the use of ICT. This was supported by Okiy (2006) who highlighted obstacles that militate against use of ICT to include, inadequate funding, acute shortage of competent manpower for ICT operation and maintenance. This was also consistent with Adebo,

Adekunmi and Daramola (2013) who found poor internet connectivity, and financial constraints as significant challenges of internet resources. Ogunlade, Joshua and Ogunlade (2013) also reported connection problem, power supply and congestion in logging-in as challenges to utilization of ICT.

Conclusions

From the findings of this study, it can be concluded that lack of access to ICT facilities, lack of support from government, lack of adequate ICT skills, erratic power supply, inadequate ICT personnel to assist in terms of training sport administrators in the use of ICT, high costs of procurement and maintenance of hardware and software, high cost of connection to Internet were challenges facing utilization of ICT among sports administrators in Nigeria.

Recommendations

Based on the findings of this study, it was recommended that

1. Government should provide funds for procurement, installation and maintenance of ICT facilities for use by SAs in the NSC;
2. Alternative sources of power such as solar should be provided to power the ICT to mitigate erratic power supply and
3. SAs should be trained and retrained to improve their ICT skills in order to assist them function optimally in the digital world so as to keep abreast of latest happenings in their sports.

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TRAINING WORKSHOP ON BASIC COMPUTER LITERACY: IMPACT ON TECHNICAL COLLEGE TEACHERS' PERCEPTION CHANGES

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Abstract

This study investigated the impact of training workshops on the perception changes of technical college teachers. Educational action research design was adopted for the study. The sample size for the study consisted of 73 participants drawn from technical colleges in Oyo State. Volunteer sampling technique was used for the selection of participants. The four basic themes of action research in a sequential order that is, "plan-action-observe-reflect" constitutes the basis of this study. The researchers were actively involved in a training workshop organized for technical college teachers. The Questionnaire on the Perceived Usefulness, Attitudes and Readiness to Implement ICT (QPUARII), focus group discussions and field notes were used for the collection of data for this study. Face validity of QPUARII was established while the internal consistency was established using Cronbach alpha statistical formula which yielded 0.87, 0.73, and 0.77 for sections B, C and D respectively. Research questions were answered using means and standard deviation while hypotheses were tested at 0.05 level of significance using paired t-test, partial correlation and ANOVA. Focus group discussion/interviews' responses and field notes were equally reported briefly. The findings of the study indicated that the training workshop had effect on teachers' perceived usefulness, attitudes towards and readiness to utilize ICT in their teaching after participation in the workshop. More so, teachers' perceived usefulness, attitude towards and readiness to utilize ICT in technical colleges were found to be significantly influenced by their areas of subject specialization and the locations of institutions. It was recommended that frequent training workshops and seminars be organized for teachers in technical colleges among others.

Keywords: *ICT Perception Changes, Perceived Usefulness, Attitudes, Readiness, Technical College Teachers*

Background of the Study

Implementation of Information and Communication Technologies (ICTs) in the classrooms has been the educational issue at the forefront of challenges of the moment in the early 21st Century. This is because, the role of (ICTs) in and for education is expanding in many countries of the world daily. Ede and Ariyo (2013) explain that ICTs have become increasingly significant as tools to accelerate social, economic and educational development. UNESCO (2002) however pinpoints that ICTs are pedals of educational system and change. Consequently, the significant role of ICT as strategies for development is essential to the running of education at all levels in Nigeria as well especially, in technical college education.

Information and communication technologies (ICTs) are used to gather, analyze, modify and exchange information (Tella, Tella, Toyobo, Adika & Adeyinka, 2015). The use of ICT for learning is associated with computers and internet to facilitate teaching and learning (Mbah,2010). Using ICTs for teaching and learning involves conveying and storage of data, browsing the internet looking for information (googling), emailing, and twittering among others. Knowing how to manage electronic information from an ever-widening array of resources and in proliferating formats is essential for building students of the computer era (Wilfred & Allan, 2013). Mahmud and Ismail (2010) explain that preparing learners for participation in a networked information society has become basic requirements for education in this era of information explosion. Educational institutions are therefore under pressure

to find better pedagogical methods to cope with these new challenges in most parts of the world. In order to fully prepare contemporary students for the challenges in a technology-oriented society, teachers have central roles as the key players. This is because teachers are widely believed to be the key agents of any educational change.

Teachers are indispensable to successful implementation of information and communication technologies (ICTs) for teaching and learning in the classrooms or schools at any level of educational institutions in Nigeria. This stems from the fact that the decision to use or not to use ICTs lies in their hands. The most important factor in determining the success of ICT in the classroom is a teacher who is confident and comfortable with and knowledgeable about computers (Mahmud & Ismail, 2010;Wilfred& Allan, 2013). In this technological-driven age, everyone requires ICT competence to survive. Most employers and employees have realized that computers and other ICT facilities are capable of enhancing efficiency (Adomi & Empror, 2010). Employees have equally realized that computers can be a threat to their jobs, and the only means of enhancing a job security is to become computer literate (Adomi & Empror, 2010). Consequently, most organizations deemed it very necessary to train and retrain their employees to establish or increase their knowledge of computers and other ICT facilities. Therefore, it can be considered that for teachers to be fully prepared to implement ICTs in technical colleges as one of Nigerian educational system; to support their students' learning; and function productively in a technology-oriented society, training and retraining exercises on the minimum basic computer literacy competencies are essential for teachers who are the implementers.

Al-Zaidiyeen, Mei, and Fook (2010) highlight the main reasons why ICTs should be used in schools explain that ICTs enables teachers to individualize instruction, which allows students to learn and develop at their own pace in a non-threatening environment. It increases the quantity and quality of students' thinking and writing through the use of word processors; develop students' critical thinking and allowing them to organize, analyze, interpret, develop, and evaluate their own work. In addition, ICTs encourage students' artistic expression; enables students to access resources outside the school; and bring new and exciting learning experiences to students. Furthermore, students need to feel comfortable using computer, since they will become an increasingly important part of students' world; creates opportunities for students to do meaningful work; and the schools need to increase their productivity and efficiency. In this case, technical college education should equally be availed of these opportunities.

In the National policy on education (FRN, 2010), technical colleges are post-primary education institutions saddled with the responsibility of producing craftsman and master craftsman as low level manpower. The main trust at this level of education involves practical training using newer methodologies of applying science, materials, tools, devices, equipment, machinery, and other resources to enable competent workers solve practical problems (Okoro, 1999). In a rapidly changing world, improved technical college education is essential to the creation of effective human capital. Consequently, it is imperative that the level of education in Nigerian technical colleges be supported with the use of ICTs. The development of useful skills at this level of education could therefore be harnessed using various digital technologies and many user friendly applications such as multimedia, power-point slides, video clips, animated graphics and audio among others for instruction. As such, manipulation of materials or objects, tools, devices, equipment, machinery, and other resources in form of performance tasks can be visualized through ICT technologies.

However, it could be observed in the current practices of most teachers in technical colleges that they have little or no special training in computers. Only a few teachers use computers in a very limited fashion. These might have serious implication on their perception. Teachers' perceptions toward ICT are an important factor that may affect the decision on whether or not to make use of ICTs. Perceptions in the context of this study refer to the three views of ICTs in terms of usefulness or benefits of using technology in learning and teaching, attitudes towards and readiness of technical college

teachers' to use ICTs. Usefulness in this sense is the quality of being of practical use. It is the perceived value or ability of computer to satisfy needs or wants. Availability of ICT tools in schools alone does not guarantee teachers effective use of the resources for instruction. Teachers should be convinced on the usefulness and benefits of these resources in improving teaching and learning. This suggests the need for effective guidance, support and training for teachers on basic computer literacy for the purpose of integrating computer technology resources into technical college instruction through direct practical experience. Teachers' basic computer literacy involves skills such as use of the keyboard and mouse, a basic understanding of the computer's operating system, manipulation of files, and cutting and pasting among others.

Teacher's attitude or behavior plays an important role in determining people reactions to situations (Al-Zaidiyeen, Mei & Fook, 2010). Thus, their attitudes toward computer can play an important role in the acceptance and actual use of computers in the classroom. Attitude is "a learned predisposition to respond to an object or class of objects in a consistently favorable or unfavorable way" (Al-Zaidiyeen, Mei & Fook, 2010). According to Eguavoen, (2011), attitude establishes a decision between two competing theories about the nature of attitude as a state of readiness, and as such could be regarded as intervening variable between a stimulus affecting a person and that person's response. In other words, a person attitude prepares him to react to a given stimulus in one way rather than in another. Davis, Bagozzi and Warshaw (1989) explain that attitude influences behavioral intention to use, and subsequent actual use in a theory of Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new software package, a number of factors influence their decision about how and when to use it.

According to Davis, Bagozzi and Warshaw (1989) and García-Santillán, Escalera-Chávez, Rangel and López-Morales (2013), TAM involves the constructs of perceived usefulness and perceived ease of use. Concern in the context of this study is on perceived usefulness which is the extent to which a person believes that using a system (or computer programme, for example) will enhance their performance. This is described as one of the constructs that have important impact on a person's attitude toward using ICT. Since the use of ICT by teachers may not be guaranteed as a result of their perceived usefulness and attitudes. This may in turn impact seriously on their readiness for its implementation in the classroom. In a better reforming approach, it becomes necessary as ICT is being expected to be implemented in the classroom, to train and retrain teachers who are the ICT users. Concerted training efforts therefore are required to get most academic staff in technical colleges up to a basic standard of computer competence and this should be a priority.

Teachers differ in their perceptions of ICTs according to the characteristics of each individual such as gender (Lau and Yuen, 2013), area of subject specialization (Winogrod, 2000) and locations of schools (Saunders, 2001). But, gender is not a subject of concern in this study. On other hand, Winogrod (2000) claimed that school location and subject area of specialization play crucial roles in a lot of decisions that affect teachers' perception. Saunders (2001) further explains that some schools are located in the rural areas while some are located in the urban areas which he describes as capable of affecting their perception. On the note of these accounts, it would be appropriate and important for demographic details of teachers to be taking into consideration in the context of this study. It is against this background that, this study sought to determine how ICT training workshop and teachers' demographic details influence their post-training ICT perceptions.

Purpose of the Study

The main purpose of this study was to investigate the effect of training workshops on the perception changes that is, usefulness of, attitude towards and readiness of technical college teachers in Oyo State. Specifically, the study sought to:

1. Find out the changes in technical college teachers' perceived usefulness of computer after the training workshop on basic computer literacy competencies.
2. Find out the changes in the attitudes held by technical college teachers after the training workshop on basic computer literacy competencies.
3. Find out the changes in technical college teachers' perceived readiness to implement the use of ICT in teaching and learning after the training workshop on basic computer literacy competencies.

Research Questions:

The following research questions guided the study

1. Do ICT training workshops affect teachers' perceived usefulness of ICTs in the classroom?
2. Do ICT training workshops affect teachers' attitude toward the use of ICTs in the classroom?
3. Do ICT training workshops affect teachers' readiness to use of ICTs in the classroom?
4. What is the relationship among technical college teachers' perceived usefulness, attitudes and readiness to utilize ICT for learning?
5. What is the influence of areas of subject specialization on technical college teachers' perceived usefulness, attitudes and readiness to utilize ICT for learning?
6. What is the influence of location of institution on technical college teachers' perceived usefulness, attitudes and readiness to utilize ICT for learning?

Hypotheses

The following hypotheses were formulated at .05 level of significance to guide the study:

H_{01}: There is no significant difference in the teachers' mean scores on their perceived usefulness of ICTs before and after exposure to training workshop on the use of ICTs in the classroom.

H_{02}: There is no significant difference in the teachers' mean scores on their attitude toward the use of ICTs before and after exposure to training workshop on the use of ICTs in the classroom.

H_{03}: There is no significant difference in the teachers' mean scores on their readiness to make use of ICTs before and after exposure to training workshop on the use of ICTs in the classroom.

H_{04}: No significant relationship exists among technical college teachers' perceived usefulness, attitudes and readiness to utilize ICT for learning.

H_{05}: Teachers' perceived usefulness, attitude towards and readiness to make use of ICT in technical colleges is not significantly influenced by their areas of subject specialization.

H_{06}: Teachers' perceived usefulness, attitude towards and readiness to make use of ICT in technical colleges is not significantly influenced by the location of their institution.

The study adopted educational action research design because the researcher is directly involved mounting an action campaign in a bid to inform, improve understanding and effect appropriate changes in the practice of teaching by the teachers. In this case, data obtained from mixed sources could be used to establish cause-effect relationship. The study was conducted in Oyo State. The four basic themes of action research in a sequential order that is, ***"plan-action-observe-reflect"*** constitutes the basis of this study. According to Maggie, (2005), in action research principles, problem is identified and data is collected for a more detailed diagnosis. This is followed by a collective postulation of several possible solutions, from which a single plan of action emerges and is implemented. Data on the results of the intervention are collected and analyzed, and the findings are interpreted in light of how

successful the action has been. At this point, the problem is re-assessed and the process begins another cycle. This process continues until the problem is resolved. In the context of this study, the processes involved an action enlightenment campaign mounted by the researcher on the empowerment of teachers; collaboration through participation in the workshops or training and discussions; acquisition of knowledge; and social change or change in the way teachers perceive the usefulness of ICT, their attitude and readiness to make use of computer in teaching their subjects.

The population of the study comprised of all 89 Vocational and Technical teachers in all the five Government Science and Technical Colleges in Oyo State. This figure of teachers' population for 2012/2013 session was obtained from Board of Technical and Vocational Education (BOTAVED), Oyo State. Volunteer sampling technique was used for the selection of participants. In all, 73 (consisting of 3 females and 70 males) technical college teachers and the researcher who is equally a teacher in a technical college in the state and who is the prime mover of the training workshop participated in the study. Thus, the study was conducted within the context of the teachers' environment in a bid to inform and change the practice in the teaching of vocational and technical subjects in Nigerian technical colleges.

The Questionnaire on Perceived Usefulness, Attitudes and Readiness to Implement ICT (QPUARII), focus group discussions and field notes were used for the collection of data for this study. QPUARII was a structured questionnaire developed by the researcher. It was a 47 item questionnaire grouped into four sections, sections A – D. Section A consists of demographic information about the respondents. Section A consists of demographic information about the respondents. Section B consisted of 20 items that sought information on perceived usefulness of ICT by the teachers. Section C consisted of 12 items that sought information on the attitudes of teachers towards the use of ICT while section D consisted of 15 items that sought information on the readiness of teachers to implement ICT in the classroom. Each of the section B – D was rated on a 5 point Likert type scale (Strongly Disagree = 1; Disagree = 2; Undecided = 3; Agree = 4; and Strongly Agree = 5)

Face validity of the instrument was established by giving the questionnaire to three experts in the field of educational technology and and two experts in the field of technology education. Their comments and suggestions on the suitability, clarity and scope of the contents were incorporated into the final questionnaire used for the study. A preliminary study was conducted on which the validated questionnaire was administered on twelve technical college teachers who had undertaken at least one ICT training course in Lagos state. The internal consistency of the instrument was established using Cronbach alpha reliability statistical formula which yielded 0.87 for section B; 0.73 for section C; and 0.77 for section D of the instrument.

In the first phase of the study, the researcher visited the five technical colleges in the state to sensitize and mobilize teachers on the need to improve on their current practices of teaching and adopt the utilization of ICT. Thus, a common problem was identified. Teachers were invited for deliberations in each of the technical colleges in the state in a bid to define the expectations and the feedback from the participants recommended that a more spaced training session, with instructions focused on basic computer literacy competencies would be more helpful. The researcher through the support and understandings by the state director of BOTAVED secured the approval of state ministry of education to sponsor and facilitate the entire process of the training workshop.

The Training Workshop on the Use of ICT organized for teachers in the five Government Science and Technical colleges in Oyo state" was held at ICT resource centre, Ibadan Polytechnics, Ibadan between Mondays 19th – 23rd August, 2013. This workshop was collaboratively organized by

the Oyo State Board of Technical and Vocational Education (BOTAVED) and facilitated by RQ Consult, Ibadan. The workshop was attended by 73 participants from the five Government Science and Technical colleges in the state. The main aim of the workshop was to provide participants with the skills on the use of ICT to deliver lessons and trainings in their subject areas. The workshop aimed at providing participants with basic computer literacy and awareness of the wealth of learning resources in the areas of teaching of Vocational and technical subjects available on CD-ROMs and from the Internet.

A five-day training workshop was held in which participants engaged in various activities including interactive theme presentations; ICT integration demonstrations; sharing of experience; hand-on-practice and round table tasks and discussions on issues relating to basic computer technology operation: operating systems; and Personal/Professional Use of computer or ICT Technology Tools: Word processing; Multimedia application; Spreadsheet; Telecomputing; and Administrative / Teacher Applications. Emphases were laid on the importance of ICTs in education; classroom management; the internet and its role in education as well how it could be used to facilitate teaching and learning. Furthermore, learning and teaching activities were designed using appropriate tools for demonstration by the instructors. Some key features of internet such as e-mail communication; very large source of information; publishing to a wide audience; Search facilities; and ubiquitous in nature of internet among others were equally learnt and the participants were given opportunities for hands-on practices with these software.

There were two sessions lasting for three hours and a session lasting two hours every day. The first two sessions were devoted to training on basic computer technology operation. Focus-groups discussions were conducted in the last session of each day. The participants were organized into groups and each group consisted of seven members. Two members of each group were appointed as the leader and secretary by their group members. The leader and secretary were given training by the researcher to conduct interview and discussion in each focus group. Video-recordings of each training session and audio-tape were used to record key elements of the discussions in each focus group discussion / interview. The researcher administered the copies of the questionnaire that is, QTPUARII on the participants before the training workshop commences.

Each group was made to have access to one computer or workstation at a time. All members of the group interacted with the computer when the need thus arisen for such and engage themselves in discussion on the materials learnt. Throughout period of the training workshop they worked together as teams in responding to the range of activities that were set for them. The materials provided for each participant consisted of a booklet organized in a modular form that covers entire activities during the training workshop, sheets of A4 size of paper and biro among others. Resources provided the participants with necessary tips and as such, serve as a trigger for discussion between them on the topics treated at the training sessions. The same instrument that is, QTPUARII with the items reshuffled was administered on the participants before the award of certificates for the participants on the last day. Observations and participation notes were made throughout the sessions. When the video-recordings of each training session were carefully reviewed, some observations were equally made. In addition, Researcher notes the observations of the teachers' behaviours, thinks about the problems and consults the literatures for cues. Upon satisfactory completion of the workshops, each participant was awarded a certificate of attendance.

The data collected from the study were analyzed using means and standard deviation, paired t-test, partial correlation, chi-square and ANOVA. Focus group discussion/interviews' responses and field notes were equally reported briefly.

Table 1:
Pre-training and Post-training Mean Scores and Standard Deviation of Teachers' Perceived Usefulness, Attitudes and Readiness to Use Computer in the Classroom Paired Samples Statistics

	Mean	N	S D	S E Mean
Pair 1				
Usefulness of ICT before the training workshop	1.8301	72	1.0431	.12313
Usefulness of ICT in the classroom after the training workshop	4.1804	72	.40131	.04730
Pair 2	1.7623	73	.97121	.11413
Attitudes towards the use of ICT before the training workshop	4.0488	73	.50592	.59210
Attitudes towards the use of ICT after the training workshop				
Pair 3	1.7203	73	.95641	.11194
Readiness to use ICT before the training workshop	4.0879	73	.32187	.03767
Readiness to use ICT before the training workshop				

Table 1 reveals that the pre-training mean scores of 1.83, 1.76 and 1.72 were obtained on the perceived usefulness, attitudes and readiness to use ICT respectively before the training workshop. The standard deviation of pre-training scores for the three factors were 1.043, .971 and .95641 respectively. Post-training mean scores of 4.1804, 4.0488 and 4.0879 were obtained on teachers' opinion on the perceived usefulness, attitudes and readiness to use ICT respectively after the training workshop. The standard deviation of post-training scores in the three factors were .40131, .50592 and .32187 respectively. Pre-training-post-training mean gains of 2.3504, 2.2888 and 2.3679 were however recorded in favour of post-training scores indicating perception changes after the teachers had been exposed to the training workshop. This implies that the training workshop influenced the mean gain recorded in favour of post-training scores.

Table 2:
Paired Samples t-Test on Teachers' Pre-training and Post-training Perception on Usefulness, Attitudes and Readiness to make Use of ICT in the Classroom

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Paired 1 Pre-training-Post-training Scores (Usefulness)	-2.35194	.84004	.09900	-2.54934	-2.15454	-23.757	71	.000
		.93391	.10931				72	.000
Paired 2Pre-training-Post-training Scores (Attitudes)	-2.28863			-2.50853	-2.07073	-20.938		
		.89852	.10516				72	.000
	-2.36767			-2.57731	-2.15803	-22.514		

Paired 1 Pre-training-Post-training Scores (Readiness)	

Table 2 reveals that that there were statistically significant effects of training workshop on the teacher's perceived usefulness, $t = -23.757$, $p = 0.000$; attitudes $t = -20.938$, $p < 0.00$; and readiness, $t = -22.514$, $p = 0.00$ to use ICT in the classroom respectively. All the results are consistent in leading to the rejection of the null hypotheses since the observed significance level is < .005 for each factor, and thus to the conclusion that the training workshop have significant effect on teachers' perceived usefulness of, attitudes towards and readiness to use ICT in the classroom.

Table 3:
Pre-training and Post-training Paired Samples Correlations of Teachers' Perceived Usefulness, Attitudes and Readiness to Use Computer in the Classroom Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Usefulness of ICT in the classroom & Usefulness of ICT in the Classroom after the training workshop	72	.649	.000
Pair 2	Attitudes toward the use of ICT before the training workshop & Attitudes toward the use of ICT after the training workshop	73	.332	.005
Pair 3	Readiness to use ICT before the training workshop & Readiness to use ICT after the training workshop	73	.343	.003

Table 3 however indicates a strong linear relationship between pre and post training workshop scores in the teachers' perceived usefulness while the linear relationship between pre and post training workshop scores in the teachers' attitudes towards and readiness to make use of ICT in the classroom are very weak.

Table 4:
Partial Correlations Summary for the Relationship among Teachers' Perceived Usefulness, Attitudes and Readiness to Use Computer in the Classroom

Correlations	Usefulness of ICT in the classroom	Attitudes towards the use of ICT	Readiness to make use of ICT in the classroom
Usefulness of ICT in the classroom	1.0000	.923	.933
Significance (2-tailed)		.000	.000
df	0	142	142
Attitudes towards the use of ICT	.923	1.000	.887
Significance (2-tailed)	.000		.000
df	142	0	142
Readiness to make use of ICT in the classroom Significance (2-tailed)	.933	.887	1.000
	0	0	0
Df	142	142	142

Table 4 indicates a very strong, positive and significant relationship within the three factors that is, the relationship between perceived usefulness and attitudes, r (142) = .923, p = .000; the relationship between perceived usefulness and readiness, r (142) = .933, p = .000; and the relationship between attitudes and readiness, r (142) = .887, p = .000 respectively. Hence, significant relationship exists among technical college teachers' perceived usefulness, attitudes towards and readiness to make use of ICT in the classroom.

Table 5:

Summary of ANOVA table on the Influence of Teachers' Areas of Subject Specialization on Teachers' Perceived Usefulness, Attitudes and Readiness to Use Computer in the Classroom

		Sum of Squares	df	Mean Square	F	Sig.
Usefulness of ICT in the classroom	Between Groups	20.234	5	4.047	4.701	.001
	Within Groups	57.682	67	.861		
	Total	77.916	72			
Usefulness of ICT in the classroom after the training workshop	Between Groups	3.394	5	.679	5.571	.000
	Within Groups	8.041	66	.122		
	Total	11.435	71			
Attitudes toward the use of ICTbefore the trainng workshop	Between Groups	19.293	5	3.859	5.326	.000
	Within Groups	48.540	67	.724		
	Total	67.833	72			
Attitudes toward the use of ICT after the trainng workshop	Between Groups	3.562	5	.712	3.210	.012
	Within Groups	14.867	67	.222		
	Total	18.429	72			
Readines to use ICT before the training workshop	Between Groups	18.155	5	3.631	5.100	.001
	Within Groups	47.706	67	.712		
	Total	65.860	72			
Readines to use ICT before the training workshop	Between Groups	2.507	5	.501	6.782	.000
	Within Groups	4.952	67	.074		
	Total	7.459	72			

Table 5 shows that F = 4.701, P = .001 and F = 5.571, P = .000 were obtained as the respective pre training and post training scores on teachers' perceived usefulness; F = 5.326, P = .000 and F = 3.210, P = .012 were obtained as the respective pre training and post training scores on teachers' attitudes towards; and F = 5.100, P = .001 and F = 6.782, P = .000 were obtained as the respective pre training and post training scores on teachers' readiness to make use of ICT in the classroom. It was indicated that the p value for the three factors are less than.05. Therefore, the null hypotheses are rejected. It implies that teachers' perceived usefulness, attitude towards and readiness to make use of ICT in technical colleges are significantly influenced by their areas of subject specialization.

Table 6:
Summary of ANOVA table on the Influence of Locations of the Institution on Teachers' Perceived Usefulness, Attitudes and Readiness to Use Computer in the Classroom

		Sum of Squares	df	Mean Square	F	Sig.
Usefulness of ICT in the classroom	Between Groups	.584	4	.146	.128	.972
	Within Groups	77.333	68	1.137		
	Total	77.916	72			
Usefulness of ICT in the classroom after the training workshop	Between Groups	.060	4	.015	.089	.986
	Within Groups	11.374	67	.170		
	Total	11.435	71			
Attitudes toward the use of ICTbefore the training workshop	Between Groups	.556	4	.139	.140	.967
	Within Groups	67.277	68	.989		
	Total	67.833	72			
Attitudes toward the use of ICT after the training workshop	Between Groups	.614	4	.153	.586	.674
	Within Groups	17.815	68	.262		
	Total	18.429	72			
Readiness to use ICT before the training workshop	Between Groups	.617	4	.154	.161	.957
	Within Groups	65.244	68	.959		
	Total	65.860	72			
Readiness to use ICT before the training workshop	Between Groups	1.169	4	.292	3.161	.019
	Within Groups	6.290	68	.092		
	Total	7.459	72			

Table 6 shows that F = .128, P = .972 and F = .089, P = .986 were obtained for pre training and post training scores respectively on teachers' perceived usefulness; F = .140, P = .967 and F = .586, P = .674 were obtained as pre training and post training scores on teachers' attitudes towards; and F = .161, P = .957 and F = 3.161, P = .019 were obtained for pre training and post training scores on teachers' readiness to make use of ICT in the classroom.

Focus Group Discussions and Field Notes on the Effect of Training Workshop on the Teachers Perception Changes

The responses from the focus groups discussions and interview indicated that training workshop had effect on the perceived usefulness of, attitudes towards and readiness to use ICT in the classroom. According to some teachers, the workshop has had a meaningful effect on their view of teaching using ICTs. Some teachers explained that they have now realized that ICT was an important thing missing in their teaching. Teachers were happy when some subjects' courseware and the use of internet for teaching were introduced to them and some of its uses were demonstrated. The experience during practical activities using computers, some subjects' courseware and the internet facilities increased their confident that it would be easier using the internet facilities and subject courseware for teaching than the use of traditional method of teaching. They were also convinced that the use of ICT entails adapting the best method of teaching in the classroom and will endeavour to use it in their teaching and will encourage other teachers to do the same. They have equally realized that ICT would help students have better understanding of technical concepts that are abstract through observation and doing.

Some teachers or participants explained that the workshop has had a big effect on their view of teaching and are ready to blend ICT in their teaching. A teacher remarked that he felt skeptical and doubted the success of the training workshop when it was introduced to them but after he had been engaged in some activities and practices, ICT was better appreciated. There are some things they did not know about ICT but the workshop made it possible for them to know.

Field Notes

It was observed that as teachers began to use the internet for surfing for teaching materials, concerns became tenser and later changed into interested stories. Quite a number of teachers indicated that they needed more practice in the use of ICT so that they could become expert users of the subjects' courseware and have better attitudes towards the use of ICT. Teachers however appeal to the administration for computer laboratory to be made accessible in their respective technical colleges.

Discussion

The results of the findings suggested that the training workshop had effect on the teachers' perceived usefulness, attitudes towards and readiness to utilize ICT in their teaching after participation in the workshop. This is similar to findings of Wilfred and Allan (2013) and Wakwinji(2011), who's on the training workshop given to teachers account for change of teaching style, perceived usefulness, and attitudes towards ICT. It was also found that areas of subject specialization and locations of institution had significant influence on technical college teachers' perceived usefulness, attitudes towards and readiness to utilize ICT for learning. These are in line with the opinions of Saunders (2001) and Winogrod, (2000) respectively.

Conclusion

The study revealed that the training workshop has changed the perception of teachers on the usefulness, attitudes towards and their readiness to make use of ICT in the classroom. In addition, teachers' perceived usefulness, attitude towards and readiness to utilize ICT in technical colleges were significantly influenced by their areas of subject specialization and the locations of institutions.

Recommendations

1. Intensive ICT capacity building for technical college teachers and other stakeholders should be embarked upon by the state board of technical and vocational education (BOTAVED) in Oyo state and other state of the federation for improving their perceptions on the use of ICT in the classroom.
2. Provision of ICT facilities including regular electricity supply to all the five state government technical colleges.
3. Compulsory ownership of laptops with internet connectivity to be passed as law on all technical teachers in the state government technical colleges.
4. Frequent training workshops and seminars to be organized for teachers in technical colleges to keep them abreast of the new trends of ICT innovations and update their knowledge and skills accordingly

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ASSESSMENT OF ENTREPRENEURIAL TRAITS ON SKILLS ACQUISITION AMONG HOME ECONOMICS PRACTICUM AND SIWES STUDENTS IN UNIVERSITIES IN OGUN STATE

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Abstract

This study assessed entrepreneurial traits in skills acquisition among Home Economics Practicum and SIWES students in Ogun –State universities. Three specific objectives and three research questions were stated. The only 3 public Universities were used for the study.120 students were purposely selected from the 3 universities to fill 23-item questionnaire that consisted of three sections. Descriptive statistics was used to analyze the data collected. The findings revealed that both male and female participated in the Home Economics Practicum and SIWES training but majority of them are females. In addition, majority of the respondents are single Christian and fall above age 21years. Also, it was revealed that majority of their entrepreneurial skills are acquired and relevant. Furthermore, majority of respondents strongly agreed and agreed that certain entrepreneurial traits in acquisition. It was concluded that since knowledge is power, the Home Economics graduates should utilize the ideas and skills acquired in the universities effectively to make money for their sustenance after school. Among recommendations stated is that universities should provide a well-furnished flat for this practicum and all students should undergo SIWES training in organization relating to Home Economics to acquire entrepreneurial skills.

Keywords: *Assessment, Home Economics. Entrepreneurship, Practicum and SIWES.*

Introduction

Knowledge is power. Education is vital to individual, society and nation at large. Whosoever that says education is expensive let him/her try ignorance and idleness. Individual, society and nation need to invest greatly on entrepreneurial skills development and training for creating jobs as well as increasing national productivity. Leach (2002) asserted that training and entrepreneurial skills developments are necessary for successful career as an entrepreneur. Hence, the benefits of training and skill developments cannot be over-emphasized in raising the living standard of entrepreneurs. Also, Hatten (2006) viewed training and entrepreneurial skill developments as necessary tools needed for a successful career by an entrepreneur.

Furthermore, Arubayi (2009) pointed out that entrepreneurial skills acquisition is the way out of the harsh economic conditions in Nigeria and other developing countries. In addition, Ukpore (2006) pointed out that if learner can be more serious during practicum and Students Industrial Work Experience Scheme (SIWES) training, they will acquire more knowledge that will make them to be more competent and be successful entrepreneur in a chosen enterprise. Osakwe (2011), Njoku (2007) and Okorie (2000) explained further that this is the reason we can hardly see any industrialized country without well-developed education. These industrialized countries invest heavily on education and training in entrepreneurial skills.

Arowomole and Adedokun (2006) viewed entrepreneurship as an undertaking in which one is involved in the task of creating and managing an enterprise for a purpose. Also, Obasan (2005) sees entrepreneurship as the process of creating something new and assuming the risk and rewards thereof and

also thought of it as the art of managing both small and large organization with a view of creati satisfaction on both sides. Furthermore, Opara (2006) and Olagunju (2008) viewed entrepreneurship as th willingness and ability of an individual to seek out investment in an environment and be able to establis and run it successfully based on the identified opportunity.

There are various entrepreneurial skills involved in any enterprise. Entrepreneurial skills involv the acquisition of abilities, knowledge and competencies that will enable learners or entrepreneurs to mak use of existing resources to produce goods and services. Ifegbo (2002) defined entrepreneurial skills as th acquisition and development of appropriate knowledge and skills that will enable an individual to maximiz the resources around him. Home economics is a broad field of study that teaches us how to manage ou resources and household. Therefore, it deals with the management of material and non-material resource in the family. In addition, Home Economics involves practical skills that if the learner pays full attentio can develop entrepreneurial skills, the learner can use to sustain himself (Anyakoha 2011 and Igbo 2006). It is during the Practicum and SIWES training that more skills can be acquired.

Home economics practicum is a laboratory experience designed to impact skills of home economic into the students. It is the practical application of specific school learning to home and entrepreneuria activities. These learning activities related to family problems and enterprises which are planned, carrie out and evaluated by the s tudents under the guidance of the lecturers and the supervisors for the purpos of personal development and improvement of home life and enterprise. In addition, SIWES exercise is t expose students to outside school practical experience. This will enable them to have all-round learnin experience in theory and entrepreneurial skills.

Home economics entrepreneurial skills embrace the following: food processing and preservation Hospitality business, child development and nursery management, pattern development and adaptation clothing construction and merchandise, fast food and restaurant operations, Textile Design, Decoration, Production and Merchandise, Interior decoration, production and merchandise, interior decorations, exterior decorations. Anyakoha (2006) explained that one can involve in home economics entrepreneurial skills on; embroidery, knitting and cloth weaving, operation of haber dasher, costume production, tailoring if one can pay attention and be serious in school and outside school, the training involved are enough fo the graduates to stand on their own after school to make money without depending on friends, families and colleagues.

It is on this that question on "why do home economics graduates still roaming about without work to do? This forms the basis of this study to assess entrepreneurial trait on skills acquisition among Home Economics students in Nigeria Universities especially in Ogun State.

The purpose of this study is to assess determinants of entrepreneurial skills acquisition among Home Economics Practicum and SIWES students in Ogun State Universities.Specifically, the study examined:

1. Socio-economic characteristics of Home Economics practicum and SIWES students in Ogun State Universities.
2. Home Economics Entrepreneurial skills acquired and their relevance.
3. Entrepreneurial traits on skills acquisition of the respondents in the study areas.

Research Questions.

1. What are the socio-economic characteristics of Home Economics Practicum and SIWES students in Ogun State Universities?
2. What are the Home Economics Entrepreneurial skills acquired and their relevance?
3. What are the entrepreneurial traits on skills acquisition of the respondents in the study areas?

Methods

Area of study: - Ogun State otherwise known as Gateway State was located in the South West of Nigeria and was created on February 3rd 1976. The State has within the tropics and consists of twenty (20) Local Government Councils with three public universities namely;

1. Federal University of Agriculture, Abeokuta, Ogun-state
2. Olabisi Onabanjo University, Ago-iwoye Ogun-state
3. Tai Solarin University of Education, Ijebu-Ode, Ogun-state.

Population of the study: it consists of four hundred level Economics Students in the three universities of Ogun State, Nigeria that had gone through Home Economics Practicum and SIWES (Student Industrial Work Experience Scheme) training.

Sample and Sampling Techniques: the sample of the study was drawn from the three public higher institutions namely Federal University of Agriculture, Abeokuta, Tai Solarin University of Education, Ijegun Ijebu-Ode and Olabisi Onabanjo University, Ago-iwoye. From each of the institutions and three hundred levels, forty students were purposively selected making a total of 120 students using simple random technique.

Instrument of Data Collection: Primary method of data collection was used for the study through structural and validated questionnaire consisted of 23-items. It consisted of three sections. Section A: 4-items of socio economic characteristics of the respondents with frequency counts and percentages consisted of frequency counts. Section B of 8-items of respondents entrepreneurial skills acquired and relevance. It also consisted of Y=yes or N= No, R- Relevant, NR- Not Relevant, LR- Low Relevant, R- Relevant and VR- Very Relevant were used. Section C of 11-items determinants of respondents entrepreneurial skills acquired and relevancy. In addition it consisted of 5-Likert Scale option

Methods of Data Analysis: Descriptive statistics were used to analyse the collected data. The tools used were frequency count, and percentages.

Table 1:
Distribution of the Socio-economic Characteristics of the respondents

S/N	Socio-economic Characteristics	Frequency	Percentages
1	**Age:** Up to 20 years	8	6.70
	21-22years	34	28.40
	23-24 years	44	36.60
	Above 24 years	34	28.30
2	**Sex:** Male	86	71.70
	Female	34	28.30
3	**Religion:** Christianity	63	52.50
	Islam	57	47.50
4	**Marital Status:** Single	119	99.20
	Married	1	0.80

Table 1 showed the frequency distribution of the socio economic characteristics of the respondent in the study area. The data revealed that 6.7 percent of respondents were up to 20 years while 28.4 perce of the respondents were between 21-22 years, 36.7 percent of the students falls between 23-24 years of ag and 28.3 percent were above 24 years of age. Also it was shown that most of the respondents were mal with 71.7 percent and 28.3 were female.

Table 2:
Distribution of respondents entrepreneurial, acquired and relevancy

S/N	Entrepreneurial skills	AcquiredSkills		Relevance of The Skills			
		Y	N	NR (%)	LR (%)	R (%)	VR (%)
1	Food processing and preservation	120(100.0)	---	----	---	38(31.7)	82(68.3)
2	Hospitality business	116(96.7)	4(3.3)	4(3.3)	40(33.3)	72(60.0)	4(3.3)
3	Fast foods and Restaurant operations.	120(100.0)	----	-----	2(1.7)	19(15.8)	99(82.5)
4	Clothing construction/merchandise	118(98.3)	2(1.7)	2(1.7)	15(12.5)	28(23.3)	75(62.5)
5	Child Development and Nursery Management	89(74.2)	31(25.8)	30(25.0)	59(49.2)	26(21.7)	5(4.2)
6	Textile Design Decoration, Production and Merchandise	88(74.2)	32(26.7)	32(26.7)	63(52.5)	18(15.0)	7(5.8)
7	Exterior Decorations, Landscaping and Horticulture	106(88.3)	14(11.7)	9(7.5)	41(34.2)	46(38.3)	24(20.0)
8	Embroidery, Knitting and Weaving	112(93.3)	8(6.7)	3(2.5)	43(35.8)	49(40.8)	25(20.8)

Key: Y= Yes, N=No, NR= Not Relevant, LR= Low Relevant R- Relevant VR= Very Relevant

Table 2 showed various entrepreneurial skills acquired and relevant by the respondents. On food processing and preservation, 100 percent of the respondents agreed that they were exposed to the skills while 31.7 percent of the respondents agreed that the skills have relevant 68.3% respondents have the

opinion that they are very important techniques. Hence, it is expected that the students that should be able to put to practice the food processing and preservation. Also, 96.7 percent of the respondents were exposed to hospitality business skills. However, 60.0 percent of the respondents posited that the entrepreneurial skills were relevant to those that may want to embark on it. Furthermore, the table indicated that all the respondents (100%) were exposed to fast foods and restaurant operations. They were of the opinion that the skills were very relevant. In the same vein, 98.3 percent of the respondents posited that they acquired clothing construction and merchandise skills which 62.5 percent and believed to be relevant to their skills. For child development, 6788 majority (74.36%, 74.2%, 88.3% and 93.3%) of the respondents were exposed and believed to be relevant.

Table 3: Entrepreneurial traits on skills Acquisition of the Respondents N=120

S/N	ENTREPRENEURIAL TRAITS	SA F(%)	A F(%)	U F(%)	D F(%)	SD F(%)
1	I have leadership skill	75(62.5)	45(37.5)	---	---	---
2	I have goals to establish an enterprise	24(20.0)	96(80.0)	---	---	---
3	I have the spirit of self confidence	85(70.8)	35(29.2)	---	---	---
4	I am task oriented	11(9.2)	109(90.8)	---	---	---
5	I am courageous to adapt to changing condition	54(45.0)	64(53.3)	2(1.7)	---	---
6	I have the ability to take risk	34(28.3)	72(60.0)	10(8.3)	2(1.7)	2(1.7)
7	I have the knowledge on how to make profit in a business	29(24.2)	90(75.0)	1(8)	----	----
8	I have ability to organize resources to achieve goal.	72(60.0)	48(40.0)	----	----	----
9	I have the ability to innovate and be creative.	71(59.2)	46(38.3)	----	3(2.5)	----
10	I have high need for achievement and success.	86(71.9)	33(27.5)	----	-----	----
11	I possess strong desire for responsibility and independence.	69(57.5)	50(41.7)	-----	1(8)	-----

Source: Field Survey (2015).

Key: SA: Strongly Agree, A: Agree, U: Undecided, D: Disagree, SD: Strongly Disagree, F: Frequency and %: Percentage

Table 3 indicates respondents entrepreneurial traits in skills acquired, majority of the respondents strongly agreed that they have leadership skill (62.5%) and self-confident in the skills acquired (70.8%). Also, 60.0 percent, 59.2 percent, 71.7 percent and 57.5 percent of the respondents strongly agreed that they have ability to organize resources to achieve goals, innovate and creative have need for achievement and success in skill acquired and lastly possess strong desire for responsibility and independence respectively.

In addition, the respondents agreed that they are goal oriented (80.0%) and task oriented (90.8%). About 53.3% agreed that they have to changing condition while 75%.of the respondents agreed that they have ability to make profit in an enterprise. However, 1.7% of the respondents disagree that they have no capacity to adapt to changing condition and 2.5% have ability to innovate and create and 1.7% of the respondents disagreed that they have ability to take risks while 8% disagreed that they possess strong desire for responsibility.

Discussion of the findings.

The findings of the research study showed that on Table 1, majority of the respondents age ranges from 2 22 years (28.4%), 23-24years (36.6%) and above 24 years (28.3%). On gender, majority of them are femal (71.7%) on religion, majority of them are Christians (52.5%) and on marital status majority of th respondents are single (99.2%).

Table 2 showed the distribution of the respondents' entrepreneurial skills acquired and relevant. Majori of the respondents agreed that eight types of Home Economics entrepreneurial skills are acquired an relevant. This is in line with Anyakoha (2011) and Igbo (2006) that confirmed that Home Economic involved so many entrepreneurial skills that can make the learner to become entrepreneur after schoo Leach (2002) and Hatten (2006) explained that training and entrepreneurial skill development are necessar tools needed for successful careers by entrepreneurs. Arubayi (2009) stressed further that entrepreneuria skill acquisition is the way out of the harsh economic conditions. Ukpore (2006) pointed out that if a learne can be more attentive during practicum and SIWES training, they will acquire more knowledge and skill that will make them to be more competent and successful entrepreneurs in their chosen enterprise. Osakw (2011), Njoku (2007) and Okorie (2000) explained further that this is why we can hardly see an industrialized country without a well-developed education. In fact, they invest heavily in education an training entrepreneurial skills.

Table 3 indicated determinants of entrepreneurial skills on the respondents. This implied that leadership i very important. In addition, leadership is concerned with the ability of the ability of the entrepreneur i using the most resources in the enterprise. This in line with Nwafor (2007) which emphasized that n entrepreneur can succeed in running his enterprise if he is not a good leader.

Conclusion

Since knowledge is power, the Home Economics students should utilize the ideas and skills acquired in th university to make money for their sustenance after school. In addition, they should inculcate the idea o managing resources properly. This will enable Home Economics graduates to manage entrepreneurial crisi properly without quitting the enterprise. Hard times never last if entrepreneurs study market situation.

Recommendations

Based on the findings of the study, it is recommended that:

1. Institutions of higher learning with Home Economics in their programme should provide a well furnished flat for this practical.
2. Every students must undergo SIWES exercise in an organization relating to their cource of study.
3. Home Economics graduates should practice their entrepreneurial skills regularly for competency.
4. Governments should encourage young entrepreneurs with funds.
5. Home Economics supervisors should live near the practicum flat to enable her visit the student regularly.
6. The technologist who is also a Home Economist should be involved in the supervision of Hom Economics practicum for efficiency.

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STAKEHOLDERS' PERCEPTION OF THE INTEGRATION OF NEEDED INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT AND FACILITIES IN DISTANCE LEARNING IN NIGERIA

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Abstract

Information and Communication Technologies (ICT) have transformed distance learning by expanding and widening access to education, improving its quality and credibility. This study investigated stakeholders' perception of the integration of needed ICT equipment and facilities in distance learning in Nigeria. Two research questions were raised; 897 respondents participated in the study drawn from five Universities in Nigeria using Research-Design questionnaire. Percentage (%) was used to analyse, the data. From the analyses, it was noted that all 27 ICT equipment and facilities were considered needed; the least among them was video conferencing (71.5%) and the highest was computer (97.7%). It was also noted that 531 (59.2%) of the respondents were female while 366 (40.8%) were male; this indicates that female respondents are slightly higher than male respondents. It is therefore recommended amongst many that government should give necessary support to integrate and procure the needed ICT aspects and materials. Conclusively, distance learning curriculum should be designed to accommodate the integration of ICT equipment and facilities.

Keywords: *Perception, Stakeholders, ICT Integration, ICT Equipment and Facilities, Distance Learning*

Introduction

Information and Communication Technologies (ICTs) are made up of diverse tools; such as computers, electronic media and mobile devices, synchronic and asynchrony platforms and the internet among many others, which are increasingly being employed by distance learning stakeholders for learning and presenting information and other activities. Thus, information and communication technologies have provided significant prospects for improved access, equity and quality form of distance learning in Nigeria. Yusuf and Falade, (2005), cited in Makinde, (2015) concluded that the process and power of interconnectivity of computers and capability of needed ICTs have provided great learning environments for collaboration, participation and interaction within and among communities of learners.

Tinio, (2010) defined ICTs as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information. These technologies includes computers, the internet, broadcasting technologies (Radio and Television), and telephony. They (ICTs) have the potential of being able to meet the learning needs of individuals, promote educational opportunities, offer high quality learning materials, increase stakeholders' self-efficacy and independent learning among learners (students), and improve teachers' professional development. (Abolade & Yusuf, 2005).

For a developing country like Nigeria, ICTs have proved to have a potential for increasing access to and improving the relevance and quality of education. Education tends to be one of the fastest growing social and economic sectors all over the world; and the use of new technologies such as ICT is an integral and driving component of the growth. Sofoluwe, (2003) posited that distance learning is

a process through which additional formal education can be earned, the evidence of which can be seen as demonstrated through the recognition and co-ordination of distance and correspondence learning institutions across the nation. This makes distance learning to be affordable and accessible anytime and anywhere. Distance learning as defined by Akande, (2011) is a formal educational programmes that embraces minimal physical contact between teacher and student with emphasis on instructional equipment, materials and or facilities. Distance Learning (ODL) is defined by Tinio, (2010) as a way of providing learning opportunities that is characterized by the separation of teacher and learner in time or place, or both time and place; learning that is certified in some way by an institution or agency; the use of variety of media. Opening and distance education, emerges from the need for external learning opportunities at various level of people who do not have access to conventional modes for various reasons such as financial or time restrictions, challenges related to job and family responsibilities, admission problem as so on.

Perception could be explained as a process of expressing one's personal view and opinion about an issue. It is a means of receiving, collecting and action of taking possession and apprehension with the mind or senses. Perception is observed to enhance encoding, decoding, interpreting and understanding a learning concept (Falade, 2004). Media are materials and equipments that facilitate learning. They are essential and unmatchable channel through which meaningful knowledge, skills and idea could be imparted on learners (Omoniyi, 2009).

Rouse, (2011) posited that the importance of ICT in distance learning lies less in the technology itself as it ability to create greater access to information and communication is greatly needed. Hismanoglu, (2012) reported that ICT in Distance Learning has been promoted as a platform for providing stakeholders with opportunities for learning. Ajayi and Ekundayo, (2011) stated that through ICT, distance learning needs have been met. This implies that teaching and learning activities in distance learning had been enormously enhanced via the presence and processes of ICT. The convenience of time, space and location are the promises that ICT is fulfilling in distance learning stakeholders. Nnazor, (2009) also supported that computer conferencing and other related ICT resources are needed for distance learning transaction essentially for individualized and collaborative learning. More so, the ability of ICT resources to collect, store, process and distribute any form of information by electronic means makes it imperative or needed in distance learning.

Obviously, one of the dividends of ICT is to bring rapid technological breakthrough to distance learning in particular, and in education generally. In addition, ICT materials are very much needed in distance learning as a contemporary intervention to complement processes of providing alternative education to many as planned by Millennium Development Goal (MDG). These ICT resources have been observed to be needed in distance learning. However, they were found to be grossly unavailable or inadequate. .

The purpose of the study is to investigate stakeholders' perception of the integration of ICT equipment and facilities into distance learning in Nigeria. Also, to investigate the influence of stakeholders' gender on their perceived ICT equipment and facilities into distance learning in Nigeria. This study is guided by the following two research questions:

(1) What is the perception of stakeholders of the integration of ICT equipment and facilities needed in distance learning in Nigeria?

(2) What influence does Stakeholders' gender have on their perceived ICT equipment and facilities in distance learning in Nigeria?

The study is a descriptive research type utilizing survey method. The researcher-designed questionnaire has two major sections; sections I and II. Section I consists of personal and institutional information

such as name of distance learning institutions, school/faculty, gender, mode of Distance Learning institution, nature/type of stakeholders and so on which requires that the respondents should fill. Section II deals with the needed ICT equipment and facilities for Distance Learning having 27 digital based ICT facilities and equipment as its Items.

The population for the study comprises all the stakeholders in distance learning in Nigeria. This consists of lecturers, facilitators, administrator, support staff such as course tutors, course writers, centre co-coordinators; and distance learners. The target population comprises all those stakeholders from University of Abuja Centre for Distance Learning and Continuing Education. Distance Learning Centres of the Universities of Ibadan, Lagos, Obafemi Awolowo, Ile-Ife and the National Open University of Nigeria (NOUN), Lagos. The institutions were chosen purposively because they cover both the single mode and dual mode distance institutions in Nigeria.

A total of 250 copies of the questionnaire distributed to each of the five distance learning institutions totaling 1250 altogether; 908 were returned while only 897 were found to be valid and used for the study. The Instrument was validated by three specialists in ICT and Distance Learning. The Instrument was tested for reliability using Pearson product moment correction coefficient of 0.87 as its value. The analysis and interpretation of data obtained through the research-designed questionnaire was by using percentage.

In answering research question 1 *(What is the perception of stakeholders on ICT equipment and facilities needed in distance learning in Nigeria?)* to investigate if ICT equipment and facilities are needed or not in distance learning stakeholders. Response to this is as shown in Table 1.

2	Satellite Facilities	787	87.7%	110	12.3%
3	Instructional/Interactive Television	788	87.80%	109	12.2%
4	Internet/World Wide Web (www) Facilities	816	91.0%	81	9.0%
5	Video Conferencing	641	71.5%	256	28.5%
6	Teleconferencing	676	75.4%	221	24.6%
7	Multimedia Equipment and Facilities	803	89.5%	94	10.5%
8	Electronic Mail (e-mail) Facilities	811	90.4%	86	9.6%
9	Internet Facilities	730	81.4%	167	18.6%
10	Electronic Library (e-library) Facilities	766	85.4%	131	14.6%
11	Bandwidth/Access Appliances	666	74.2%	231	25.8%
12	Data Processing Facilities	781	87.1%	116	12.9%
13	Editing Studio	663	73.9%	234	26.1%
14	Online Multimedia (Interaction and Non interactive)	764	85.2%	133	14.8%
15	CDs/CD ROM	751	83.7%	146	16.3%
16	Live Audio and Video: Unicast, Multicast and Broadcast	714	79.6%	183	20.4%
17	Short Message Service (SMS)	728	81.2%	169	18.8%
18	Personal Digital Assistants (PDA)	710	79.2%	187	20.8%
19	Digital Recording Facilities	746	83.2%	151	16.8%
20	Electronic Book (e-book) Readers	760	84.7%	137	15.3%
21	Memory Cards	758	84.5%	139	15.5%
22	Flash Drives	762	84.9%	135	15.1%
23	Mobile Phones	756	84.3%	141	15.7%
24	Radio	713	79.5%	184	20.5%
25	Laptop	829	92.4%	68	7.6%
26	Tablets	684	76.3%	213	23.7%
27	Interactive Whiteboards	728	81.2%	169	18.8%

The responses of the respondents in respect of the ICT equipment and facilities needed for distance learning are as shown in Table I. Majority of the stakeholders [97.7%] indicated that computers were needed while 2.3% of the stakeholders indicated computers were not needed. Also, 87.7% of the stakeholders indicated that satellite facilities were needed while 12.3% indicated otherwise. For instructional/interactive television (ITV), 87.8% of the stakeholders claimed it was needed, while 12.2% indicated otherwise.

Furthermore, 91.0%of the stakeholders indicated that www facilities were needed while 9.0% stakeholders responded that they were not needed. For video conferencing, 71.5% indicated that it was needed, while 28.5% indicated that it was not needed; for teleconferencing 75.4% claimed it was needed, while 24.6% claimed it was not needed. Percentage of the respondents indicated that the Digital Based ICT facilities and materials needed for distance learning in Nigeria was found to be above 70%. Based on this, it could therefore be established that digital based ICT equipment and facilities are essentially needed for Integration of ICT in distance learning in Nigeria. From the percentage analyses, it can be inferred that all the ICT equipment and facilities were considered required by the stakeholders with the least accepted, which is video conferencing 71.5% and the highest which is the, attracting an overwhelming

97.7%.

In answering research question 2 *(What influence does stakeholders' gender have on their perceived ICT equipment and facilities for distance learning in Nigeria?)* Table 2, shown that 531 (59.2%) of the respondents were females while 366 (40.8%) were males. It is obvious that females formed the highest number of respondents and were more influenced than their male counterparts.

Table 2: Percentage Distribution of Respondents by Gender

Gender	No of Respondents	%	Mean
Male	366	40.8	2.1
Female	531	59.2	2.9
Total	897	100.0	

The results on the stakeholders' perceived digital based ICT resources showed that they responded in favour of the dire need of ICT facilities. Example of such ICT facilities are video conferencing, digital recording facilities, internet facilities, memory cards, on-line multimedia, multimedia equipment, interactive television, satellite facilities and so on. This is in support of Dabbagh and Bannan-Ritland, (2005); Beers (2007); Epper and Bates, (2007) who claimed that the quality of distance learning could be improved through the availability and use of technology. This suggests that ICT resources are needed in improving the quality of distance learning in Nigeria.

Discussion of the Findings

Information and Communication Technology (ICT) had been recognized as a potent force to transform the development, pace and status of a country (UNDP, 2007; Badmus, 2013). In recent time, the teaching and learning process has been dramatically changed by the synthesis of variety of technological, instructional and pedagogical developments (Marina & Smith, 2002).

Gender is an important factor in every aspect of learning; it has a significant impact on all stakeholders of education generally and especially on distance learning (Green, 2009). However, in reality; gender issues are not holistically addressed in the integration or application of ICT (Fontaine, 2009). One of most reasons the researches were considering investigation of gender, ICT and

Table 1: Perception of the Respondents Analyses on ICT Equipment and Facilities Needed for Distance Learning in Nigeria

S/N	Digital based ICT Facilities and Materials	Needed		Not Needed	
		N	%	N	%
1	Computers	876	97.7%	21	2.3%
2	Satellite Facilities	787	87.7%	110	12.3%
3	Instructional/Interactive Television	788	87.80%	109	12.2%
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The responses of the respondents in respect of the ICT equipment and facilities needed for distance learning are as shown in Table I. Majority of the stakeholders [97.7%] indicated that computers were needed while 2.3% of the stakeholders indicated computers were not needed. Also, 87.7% of the stakeholders indicated that satellite facilities were needed while 12.3% indicated otherwise. For instructional/interactive television (ITV), 87.8% of the stakeholders claimed it was needed, while 12.2% indicated otherwise.

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The results on the stakeholders' perceived digital based ICT resources showed that they responded in favour of the dire need of ICT facilities. Example of such ICT facilities are video conferencing, digital recording facilities, internet facilities, memory cards, on-line multimedia, multimedia equipment, interactive television, satellite facilities and so on. This is in support of Dabbagh and Bannan-Ritland, (2005); Beers (2007); Epper and Bates, (2007) who claimed that the quality of distance learning could be improved through the availability and use of technology. This suggests that ICT resources are needed in improving the quality of distance learning in Nigeria.

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Gender is an important factor in every aspect of learning; it has a significant impact on all stakeholders of education generally and especially on distance learning (Green, 2009). However, in reality; gender issues are not holistically addressed in the integration or application of ICT (Fontaine, 2009). One of most reasons the researches were considering investigation of gender, ICT and

education was that women and girls are poorly placed to benefit from the knowledge economy because they have less access to scientific and technical education specifically, and to education in general. They have less access to skills training and development which will enable them to gain employment in the information and communication technology (ICT) sector, and when they do, they generally get work at the lower levels, with less pay (Huyer, 2003). Their perception was in favour of the integration of ICT equipments and facilities in distance learning in Nigeria.

She added that these initial disadvantages have prevented women and girls from benefiting equally from the opportunities that the entire range of ICT can bring; yet paradoxically, the new technologies also offer many opportunities for women and girls to gain the education and technical skills required for them to participate equally in the knowledge economy. A number of studies have been conducted on the subject. For instance, Hafkin and Taggart, (2001); Micter, (2001) revealed in their studies that the participation of women in IT design and development was generally low. A number of other studies which have been conducted revealed that males are more exhaustive in the internet usage, they enjoy more competitive forms of learning while using ICT than females (Badmus, 2013; Colley, 2003; Capper & Weaver, 2003; Volman & Eck, 2007). There are several investigations indicating that gender gaps probably became more latent and more complex (Odogwu & Nyala, 2010).

Kuwahara, (2007) did a study on post graduate admission in Japan based on gender submitted that 6.8 percent of Ph. D. students in Physics were women, and 7.1 percent women were admitted for Ph.D. programme in engineering. In Senegal, women make up to 26 percent of students in medicine, pharmacy and dentistry, and 15 percent in science and technology (Der, 2002; Huyer, 2003). Similarly, in Nigeria, women make up to 30 percent of all technical and related workers, however, only 1 percent of engineers are women (Chinye, 2002; Huyer, 2003). The Carribean is the only region where the percentage of women working in science and engineering is over 50 percent (UNDP, 2002; Huyer, 2003).

Looker and Thiessen, (2003) in their study on gender differences and computers' use among students used Canada found that male students, generally used computers more frequently than female students. Male students were also more competent in using various ICT applications than their female counterparts (Bimber, 2002; Pritchard, 1998). However, Marwan, (2008) reported in his findings that there is a difference in frequency of computer use between male and female student, female use computer more frequency than male computer part with mean values of 3.06 and 2.76 respectively. McLanchlan, Crag and Coldwell, (2010) concurred that the ICT industry is suffering from a significant shortage of skill personnel in Australia. Lynch, (2007) and Grad Careers in Engineering, Science and IT (2008) had earlier posited the same.

Wheeler, (2002) in his study on student perception of learning support in distance education found that one way Analysis of Variance (ANOVA) revealed statistical significant differences between the male and females in expected practical support [F (1,27)] = 4.965, P< 034, with females expecting substantial support in this area. Females also received more practical support, but not so much as they generally expected. A gender difference was consistently observed in both expected and received support, with females generally receiving more practical and academic support than males, and males receiving more social support than females.

Based on the above, there is no gender discrimination towards ICT and working with computers as neither male nor female students have any reason not to embrace ICT in their learning. Green, (2009) pointed out that lack of computer skills is a severe barrier for women and girls in accessing the new ICTs. The World Links gender research found that girls had inequitable access to the computer laboratories in some schools as a result of several conditions: college student – to –

computer ratios at first-come, first – served policies did not favour the girls; girls access was limited due to domestic chores responsibilities.

Implications

This study explored the stakeholders' perception of the needed ICT equipment and facilities into distance learning in Nigeria. The result obtained from data gathered and analyzed indicated that basic ICT facilities and equipment are needed for distance learning in Nigeria.

Though, those were greater number of female respondents (59.2%) in this study than their male counterpart (40.8%). However, the overall result show that the gender has no influence on their perceived ICT equipment and facilities for Distance Learning in Nigeria.

Recommendations

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

(1) government at all levels, should give necessary supports to procure all needed ICT facilities and equipment for distance learning programs in Nigeria;

(2) gender biases in any form should be avoided at all levels in distance learning regarding ICT facilities and equipment utilization;

(3) a workable ICT policy that will be friendly to all levels and categories of educational programme should be formulated; of which distance learning should not be left out;

(4) distance learning programme curriculum should be designed to accommodate the use of ICT facilities and equipment; and

(5) stakeholders involved in distance learning should take the lead in shifting the paradigm from the use of print materials to the use of ICT equipment and facilities.

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USAGE OF WHATSAPP AS A SOCIAL MEDIA PLATFORM AMONG UNDERGRADUATES IN KWARA STATE

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Abstract

Social media has become a tool for socialization among undergraduates. There are various social me platforms that are used by undergraduates. One of the recognized social media platform is Whatsapp mobile messaging platform which makes communication easier and faster thereby enhancing effective fl of information and idea sharing. This study examined Whatsapp as a favorite social media platform educational purpose among undergraduates in Kwara State. The research type employed for this study a descriptive survey. The population for this study were all undergraduates in universities in Kwara St while all 300 level undergraduates were the target population. In this study, 387 undergraduates w proportionately sampled and responded to a researcher-designed questionnaire with a content validity 0.87 reliability index. Percentage, mean and standard deviation were used to answer the research questi raised in this study while bar-chart was used to present the results. Finding revealed that Whatsapp is favorite social media platform among undergraduates in Kwara State. The study recommended amo others that undergraduates should see Whatsapp as an avenue to connect with fellow students to facilit learning beyond classroom walls.

Keywords: *Whatsapp, Social Media, University Undergraduates*

Introduction

Globally, it took the old transistor radio 38 years to have 50 million users while television spent 13 ye to reach 50 million users and the world wide web (www) accomplished this figure in less than half o decade (4 years) but 3 years was all Apple's tablet needed to reach 50 million users and this number users (50 million) accessed facebook in less than a year (Iqbal, 2012). Ajewole and Fasola (2012) report that there were 1.5billion users of social media platforms in the world between 1997 and 2010, w facebook topping the list with over 900million users. Swartz (2014) tweeted that facebook ranks among most populous nation in the world with 1.35 billion users, second only to China with 1.367 billi population. Sesan (2014) tweeted that Nigeria currently have 12.6 million facebook users (7.4% Nigeria's population) out of the 1.35 billion users in the world, representing 0.93%.These statistics depi the level of awareness of social media usage around the world and that social media has ensured that w live in an interconnected world.

According to Adegbillero-Iwari (2014), social media differs from old form of mass media in man ways, including, quality, sophistication, reach, speed, efficiency, frequency, accuracy, usability, reliabili cheapness, immediacy, portability and permanence as it allows interaction among its users in which th create, share, exchange information and ideas in virtual communities and networks. The aforementione prompted Adaja and Ayodele (2013) to label social media as a driver of social change, organizational a national development. These authors posited that one of the major advances of the 21st century is t discovery and emergence of social media which has facilitated the creation of different platforms for soci

interaction. In addition, Olaniran (2014) tagged social media as a revolutionary medium of socialization for dismantling previously existing man-made obstacles to information dissemination and sharing.

In the words of Ekeanyanwu and Kalyango (2013), social media is the ninth wonder of the world. Osahenye (2012) summarized the qualities of social media as an unstoppable power which is contagious and has outreaching impact. Aina (2013) called this social media generation as the information age. Earlier, Tapscott (1997)postulated that children of the information age would be micro-monsters and web-sharks whose cognitive process as hand-eye coordination and functional observation would be such that their levels of ability and skills would far surpass those of their parents and teachers.This situation is not a surprise as youths are by their nature more disposed to social communication technologies (Onah & Nche, 2014). Asogwa and Ojih (2013) consented with the label of today's youth as the most wired and connected generation in human history. Earlier, Ulrich and Harris (2003) described today's youth with terminologies like *Net Kids*, *Generation X*, *Generation @*, *Adolescents*, *Tweenagers, Netizens*, and so on. According to Nnamonu (2013), while the internet is the chief host of social media, the youth are the most predominant clients.

Across the globe, the fate of social media is intertwined with the proliferation of mobile phone usage which is also evident in Nigeria. Nigeria currently has 115 million mobile phone subscribers which ranks the nation second behind Egypt in Africa on mobile phone usage (Africa Practice, 2014). International Telecommunications Union (ITU, 2012) revealed that 39.6% of all internet traffic in Africa is from Nigeria and the statistics of Deloitte (2012) showed that more people in Nigeria have been introduced to the internet through mobile phones. Hence, the growing amount of people in traffic generated from internet via mobile phones, highlight the vast interests and upsurge in social media platforms. Micaiah (2014) gathered that undergraduates (19 – 35years) represent 78% of Nigeria's internet population (50million). Africa Practice (2014) estimated that about 80% logins on social media platforms are from some form of mobile devices.

Oyero (2013) posited that the proliferation of internet broadband connection, mobile and portable devices such as smartphones, modems, wireless internet services, laptops, e-readers, tablets, Ipads have increased the use of social media in Nigeria. Klein (2013) assertively stated that in our contemporary technologically driven and information heavy world, everyone has a variety of digital resources at their fingertips, as we now live in a networked and plugged in society, a society of online consumption. Uwem, Enobong & Nsikan (2013) pointed out that there are specific social media platforms that are designed for mobile phone users and popular in Nigeria. Such mobile platforms include nimbuzz, 2go, dodge-ball, eskimo, snaptu, bbm, qeep, whatsapp, and so on. Whatsapp was founded by former employees of Yahoo!, Brian Acton and Jan Koum who combined twenty years doing exciting work for Yahoo. Whatsapp is a pun on "What's Up" and launched in 2009. It was built as a better SMS alternative that works with virtually all smart phones. This cross social media mobile messaging application has over 5million users in Nigeria and was acquired by Facebook for 19 billion US Dollars within five years after its launch, on 19th February, 2014.

The problem of this study stems from the growing apprehension among educators on students' addictive and unproductive use of social mediaand how it reduces time devoted to studies (Ajewole & Fasola, 2012; Noah, Oyeyemi, & Adeyemo, 2014). Amali, Bello and Hassan (2012) identified undergraduates as a substantial category of Nigerians who are mobile phone users in a survey of university of Ilorin students' use of mobile phones in the classroom. The study showed that use of mobile phones for various purposes were rampant among undergraduates. Otunla (2013) also found that one of the purpose of using mobile phones by undergraduates is to gain access to social media. Micaiah (2014) revealed that undergraduates belong to the largest category of social media users in Nigeria, representing 45% of

Nigeria's internet population. This study seeks to examine the favorite social media platfo undergraduates and the purpose for its use.

Research Questions

The following research questions addressed the objectives of this study:

1. Which social media platform is considered as favorite among undergraduates?
2. How frequent do undergraduates use social media?
3. What are the factors that motivate undergraduates to use social media?
4. Which social media platform is considered as favorite among undergraduates for educati purpose?

Methodology

This study was a descriptive survey research. The population of this study consisted of all undergradu in universities in Kwara State. The target population for this study was all 300 level undergraduates fr two purposively sampled universities out of four universities in Kwara State. Multi stage sampli procedure was adopted for this study, as different sampling techniques were used at different stages sampling in this study.Purposively, the universities in Kwara State were clustered into two categories public and private ownership, hence, University of Ilorin and Al-Hikmah University were randon selected to represent both public and private ownership respectively. Proportionate sampling technique w adopted in the selection of 387 respondents from the two sampled universities to ensure fair representati in this study. As University of Ilorin has more undergraduates' population than Al-Hikmah University.

A researcher-designed questionnaire was used to elicit the needed data for this study. The cont validity was ascertained by experts in the field of study who scrutinized the items and made possi alteration and suggestions. Test-retest reliability method was used with a sample of 110 respondents Kwara State University within three weeks interval. The scores of the tests were correlated with the use Pearson Product Moment Correlation coefficient and a reliability index of 0.87 was obtained. Four resear questions were raised for this study and answered with percentage, mean and standard deviation, and b chart was used to present the results.

Results

Research Question 1: Which social media platform is considered as favorite among undergraduates?

Data obtained from the questionnaire was used to answer research question 1, with percentage a bar-chart used to present the result in Table 1 and Figure 1.

Table 1: Favorite Social Media Platform of Undergraduates

Favorite Social Media Platform	Frequency	Percentage (%)
Facebook	94	24.3
Twitter	43	11.1
Instagram	52	13.4
Youtube	7	1.8
Whatsapp	174	45
Wordpress	2	0.5
Others	15	3.9
TOTAL	**387**	**100**

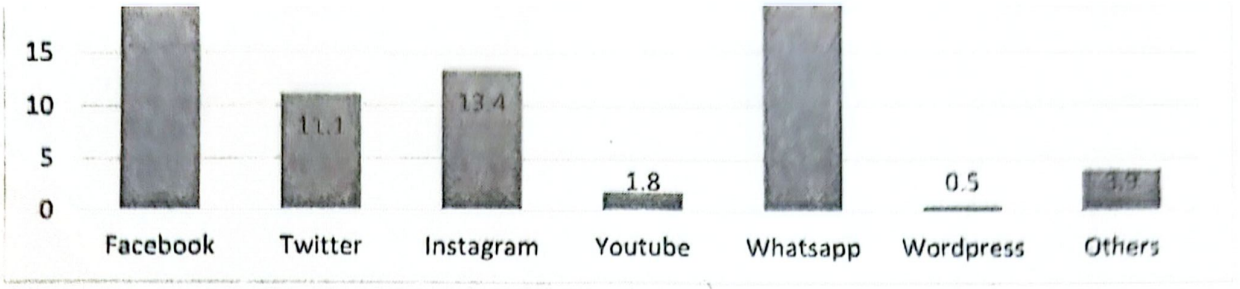

Figure 1: Favorite Social Media Platform of Undergraduates

Table 1reveals that out of 387 undergraduates sampled, 174 (45%) identified Whatsapp as their favorite social media platform. 94 (24.3) of the sampled respondents selected Facebook as favorite social media platform, Instagram (52 – 13.4%) and Twitter (43 – 11.1%) fall in between of favorite social media platforms while Wordpress has the lowest frequency rate 2 (0.5%). Figure 1shows that Whatsapp is the favorite social media platform of undergraduates.

Research Question 2: How frequent do undergraduates use social media?

The data collected for research question 3 was answered with the use of percentage and bar-chart, and the result was presented in Table 2 and Figure 2.

Table 2: Undergraduates' Frequency of Use of Social Media

Undergraduates' Use	**Frequency**	**Percentage (%)**
Regularly at all times	315	81.4
Mostly at Nights	35	9.0
Mostly during Weekend	21	5.4
Irregularly	16	4.1
TOTAL	**387**	**100**

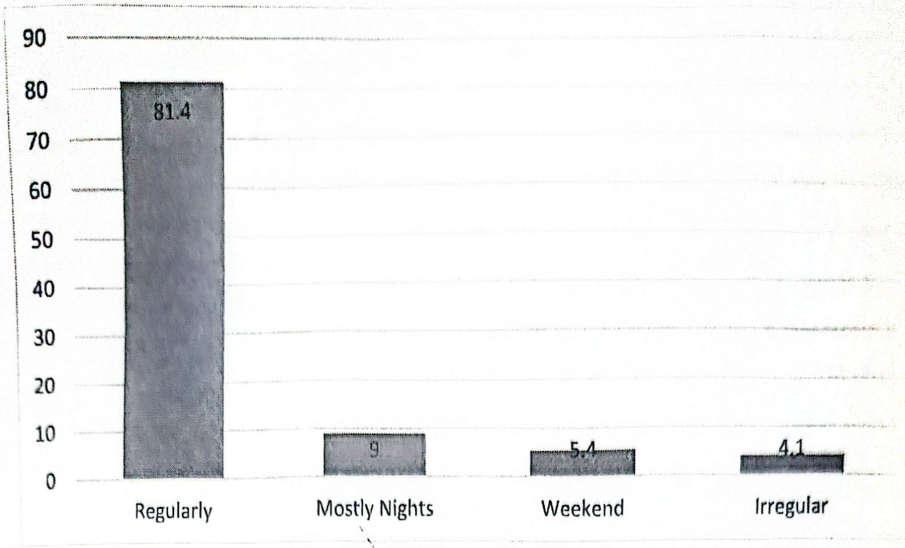

Figure 2: Undergraduates' Frequency of Use of Social Media

Table 2 reveals that a high frequency of respondents sampled, 315 (81.4) use social media regul at all times; 35 (9%) use social media mostly at nights; 21 (5.4) use social media mostly during weeke while others 16 (4.1%) use social media irregularly. Figure 2 shows that there is high frequenc respondents' usage of social media regularly at all times. This implies that social media is an indispens part of undergraduates' lives.

Research Question 3: What are the factors that motivate undergraduates to use social media?

Research question 3 was answered using mean and standard deviation with the data from Item section B of the instrument and result revealed in Table 3.

Table 3: Undergraduates' Social Media Motivating Factors

Motivating Factors	Frequency	Mean	St. D	Ranking
Reunite with Old Friends	184	1.99	.088	1st
Collaborative Learning	170	1.95	.216	2nd
Connect with New Friends	148	1.93	.264	3rd
Fun and Leisure	125	1.92	.272	4th
Informed on Global Events	119	1.88	.327	5th
Ease Boredom	118	1.84	.362	6th
Entertainment Gossip & Gist	113	1.78	.416	7th
Music/Movies	101	1.76	.429	8th
Religious Propagation	94	1.74	.440	9th
Work and Study	86	1.71	.455	10th
Curiosity	60	1.70	.461	11th
Networking & Business	47	1.69	.462	12th
Political Engagement	31	1.68	.468	13th
Humanitarian Causes	29	1.62	.487	14th
Dating/Flirting	19	1.56	.497	15th
Others	3	1.52	.500	16th

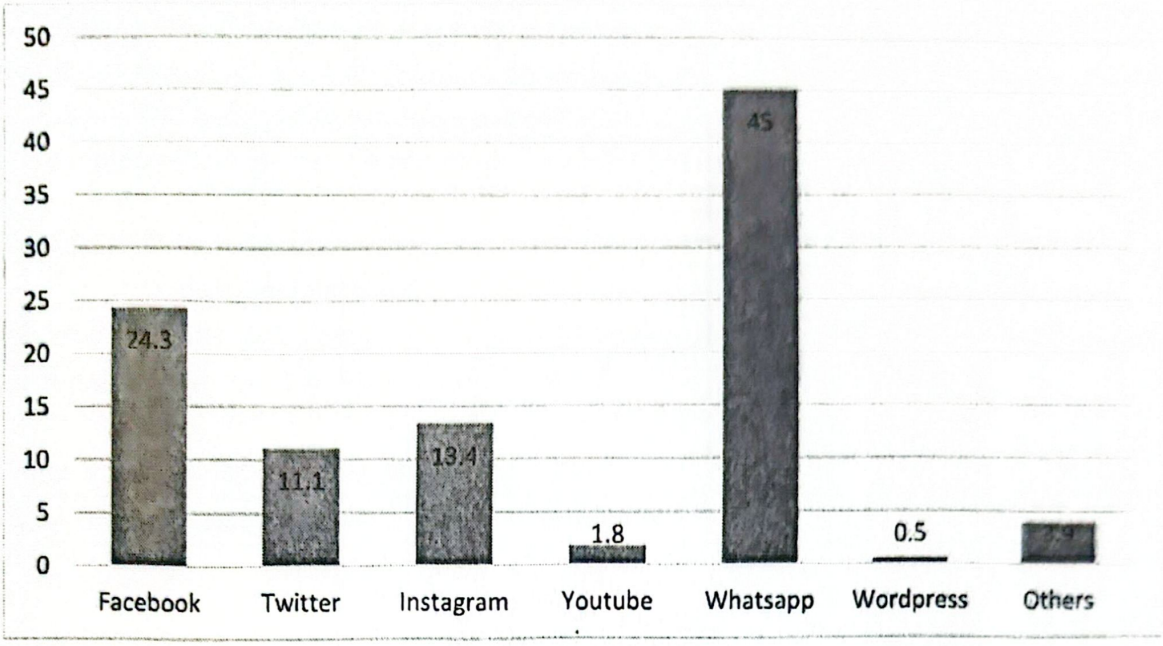

Figure 1: Favorite Social Media Platform of Undergraduates

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TOTAL	**387**	**100**



Figure 2: Undergraduates' Frequency of Use of Social Media

Table 2 reveals that a high frequency of respondents sampled, 315 (81.4) use social media [illegible] at all times; 35 (9%) use social media mostly at nights; 21 (5.4) use social media mostly during [illegible] while others 16 (4.1%) use social media irregularly. Figure 2 shows that there is high frequency respondents' usage of social media regularly at all times. This implies that social media is an indispensable part of undergraduates' lives.

Research Question 3: What are the factors that motivate undergraduates to use social media?

Research question 3 was answered using mean and standard deviation with the data from item section B of the instrument and result revealed in Table 3.

Table 3: Undergraduates' Social Media Motivating Factors

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Music/Movies	101	1.76	.429	8th
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Curiosity	60	1.70	.461	11th
Networking & Business	47	1.69	.462	12th
Political Engagement	31	1.68	.468	13th
Humanitarian Causes	29	1.62	.487	14th
Dating/Flirting	19	1.56	.497	15th
Others	3	1.52	.500	16th

Table 3 indicates that Reunite with old friends was ranked highest among the factors that motivate undergraduates to use social media with a mean score of 1.99. Collaborative learning had mean score of 1.95 (2nd), and Connect with New Friends had mean score of 1.93 (3rd) were the major motivating factors. This implies that collaborative learning was one of the major reasons undergraduates use social media.

Research Question 4: Which social media platform is considered as favorite among undergraduates for educational purpose?

Data obtained from the questionnaire was used to answer research question 4, with percentage and bar-chart used to present the result in Table 4 and Figure 3.

Table 4: Favorite Social Media Platform of Undergraduates

Favorite Social Media Platform	Frequency	Percentage (%)
Facebook	87	22.4
Twitter	33	8.6
Instagram	5	1.3
Youtube	38	9.8
Whatsapp	197	50.9
Wordpress	22	5.7
Others	5	1.3
TOTAL	**387**	**100**

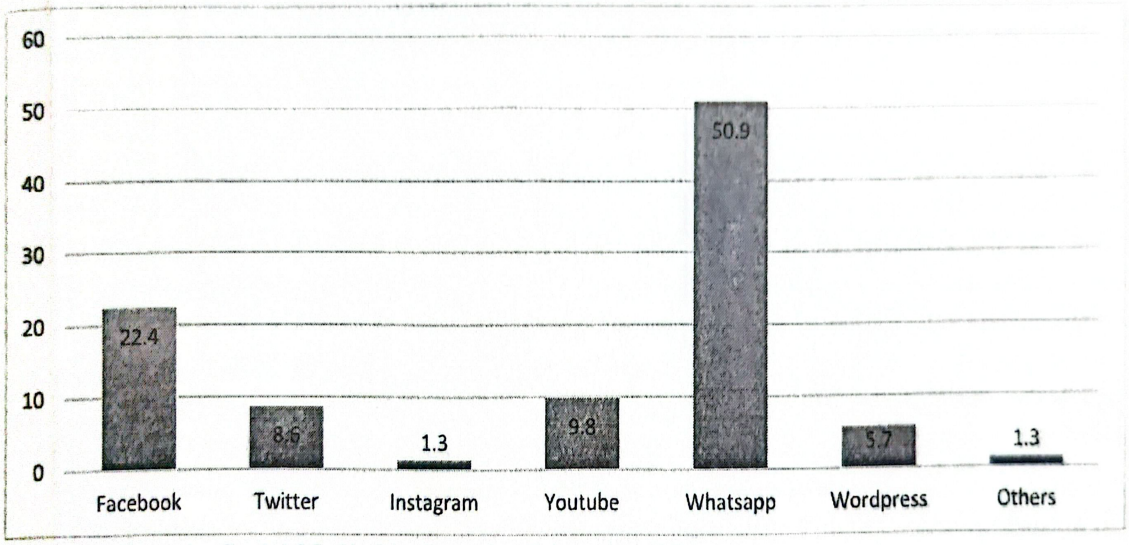

Figure 3: Favorite Social Media Platform for Educational Purpose

Table 4 reveals that out of 387 undergraduates sampled, 197 (51%) identified Whatsapp as their favorite social media platform. 87 (22.4) of the sampled respondents selected Facebook as favorite social media platform, Twitter (33 – 8.6%) and Youtube (38 – 9.8%) fall in between of favorite social media platforms while Instagram has the lowest frequency rate 5 (1.3%). Figure 3 shows that Whatsapp is the favorite social media platform of undergraduates for educational purpose.

Summary of Findings

Based on the data collected, analysed and interpreted, the following are the major findings obtained:

1. Whatsapp is the favorite social media platform of undergraduates.
2. Social media is an indispensable part of undergraduates' lives.
3. Collaborative learning is one of the major reasons undergraduates use social media.
4. Whatsapp is the favorite social media platform of undergraduates for educational purpose.

Discussion of the Findings

Finding of this study revealed that Whatsapp is the favorite social media platform of undergraduates in Universities in Kwara State and in line with the findings of Africa Practice (2014) who discovered that Whatsapp is one of the mobile chat apps with the most users in Nigeria. Walker (2014) also found out that whatsapp has become the social media tool of choice in Qatar and other Arab countries such as Lebanon and Sudan. In addition, it buttressed the finding of Holliday (2014) that the likes of whatsapp, wechat are the future of social media, the next breed of social media with the use of the platforms going mobile. This is due to the dynamic social media behavior of users, including university undergraduates which has led to the rise of messaging apps like Whatsapp.

Holliday (2014) enunciated that the use of social media has become more fragmented and decentralized that unlike in the past when most users, especially those that started with facebook, would use a certain site for all their social media needs. However, in recent years, with the launch of more social media platforms offering specialized services, users are more inclined to use a cluster of different social media platforms (Holliday, 2014). An undergraduate may use Whatsapp to message course-mates on lecture time-table, use Instagram to share pictures of campus events and twitter to monitor the news and whisper/confess their secrets to followers. Holliday (2014) noted that a one size fits all network is no longer the preferred choice of users, especially university undergraduates. Africa Practice (2014) corroborated the above that numbers show Facebook is losing active users (logged in and engaged) to other social media platforms such as Whataspp in Nigeria and other African countries.

The outcome of the analysis of this study also revealed social media as an indispensable part of undergraduates' lives and thus, in line with Noah, Oyeyemi, & Adeyemo (2014); Sanusi, Gambo, & Bashir (2014); Otunla (2013); Ezeah, Asogwa and Obiorah (2013); Ajewole and Fasola (2012) who found that social media has become a constant presence and almost indispensable part in the lives of the average Nigerian undergraduates. This finding also confirmed Ajewole and Fasola (2012); Otunla (2013);and Noah,et al. (2014) that undergraduates are spending countless hours immersed in social media platforms by posting comments, liking pictures and poking friends on facebook; tweeting on trending hashtags on twitter; chatting with old and new contacts on whatsapp, in the same lecture room or across the atlantics; chatting while snapping, and sharing of selfies and latest outfits on instagram; reading current articles on topical issues via wordpress; and uploading and viewing latest videos on youtube. Thus, the socialization patterns of undergraduates have dramatically and rapidly evolved, as social media is now solely depended on for all forms of social interaction. A situation described by Ajewole and Fasola (2012) and Noah, et al (2014) as leading to addiction and individualism.

Another finding of this study revealed that collaborative learning is one of the major reasons for undergraduates' use of social media and also one of the major benefits undergraduates derive from social media. This finding is in line with Lenhart, Purcell, Smith and Zickuhr (2010); Guy (2012); Veletsianos & Navarrete (2012); Davis III, Deil-Amen, Rios-Aguilar, and Gonzalez Canche (2012); and Lupton (2014) who found that learners enjoyed and appreciated both the social learning experience afforded by

social media and supported themselves in their learning, enhancing their own and other students' experiences. This finding confirmed that undergraduates' use social media, among other things to build networks of like-minded people, stay connected to share knowledge and information.

The last finding revealed that Whatsapp is the favorite social media platform of university undergraduates. This finding is in consonance with Sanusi, et al (2014) added that Whatsapp is widely used as a social media platform among students of polytechnic in Nigeria for academic purpose. Whatsapp is a mobile messaging platform which makes communication easier and faster thereby enhancing effective flow of information and idea sharing among students (Yeboah & Ewur, 2014). It is quite logical to find Whatsapp as the favorite social media platform of university undergraduates as the mobile messaging platform has collaborative features which provide university undergraduates with the ability to exchange messages, images, videos and voice notes to their contacts and study groups. Whatsapp messenger offers university undergraduates the opportunity to send messages without limits and creates study groups who can engage in educational forums (Amry, 2014).

Conclusion and Recommendations

This study has brought to the fore the positives of social media for the development of education, using Whatsapp as a major educational tool for students. The findings of this study strengthened the argument that infusion of social media platforms as teaching and learning aids might curb undergraduates' distraction in their academic activities. While, it may be quite laborious to incorporate most of the social media platforms in the educational system, the findings of this study has narrowed down the platforms to one (Whatsapp). Hence, this study understands that the incorporation of Whatsapp into academic practice would facilitate a positive engagement among undergraduates who have been using the mobile messaging platform to enhance collaborative learning.

In conclusion, the implication of this study is to re-position Nigerian universities as the pinnacle of education revolution and information dissemination to serve their proper roles as drivers for national development and innovation. By this, Nigerian universities must shed the toga of laissez-faire stance on social media and acknowledge the prominence of social media as an indispensable part in the lives of university undergraduates. Based on the findings of this study, the following are suggested:

1. University undergraduates should see Whatsapp as an avenue to connect with fellow students, locally and internationally, to facilitate learning beyond classroom walls.
2. 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.
3. Universities should incorporate suitable social media platforms in academic activities to provide both lecturers and students with other teaching and learning opportunities.
4. University management should engage students on social media to cease the initiative and enhance the use of social media for beneficial means.

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ASSESSMENT OF SKILLS ACQUISITION OF HIGHER NATIONAL DIPLOMA GRADUATES IN AUTOMOBILE TECHNOLOGY IN NIGERIA

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Abstract

This study accessed skills of Higher National Diploma Graduates of Automobile Technology in North Central States of Nigeria. Two research questions and two null hypotheses were formulated, tested at 0.05 level of significant to guide the study. A cross-sectional survey research design was used for the study. All accessible population was purposively selected for the study. It comprised of 70 Heads of Departments, 60 supervisors and 430 Graduates totaling 560 respondents working in Automobile Industries. Validated questionnaire was used to elicit responses from respondents. The data collected was analyzed using mean and standard deviation to answer the two research questions, while two hypotheses were tested using, one – way ANOVA and Post Hoc Test of Homogenous subsets statistics. The findings revealed that graduates were skillful in design of automobile vehicle parts and in the interpretation of engineering drawing of automobile vehicle components. However, there was significant difference in the mean ratings of the respondents in which Heads of Departments rated graduates higher. It was recommended that the graduates should improve in the application of basic tools in Auto-CAD to design and interprete computer programming of automobile components.

Introduction

Different authors defined skills acquisition in various ways; their definitions tend towards employee's motivation. For instance, Hornby (2015) stated that skills acquisition is ability to do something expertly well, especially as a result of continuous practicing. This involves physical manipulative process that result in the achievement of ultimate goal. Practical skills acquisition aims at transforming people in order to contribute effectively to social, economic and technological development of the nation. Okorie (2001) remarked further that skills acquisition is the process of equipping individual with saleable skills necessary for employment that helped workers to be up-to-date. Okorie stressed that skills acquisition denotes a well-established habit of acting, thinking or behaving in a specific way that become natural to the individual through repetitive practice. Besides, the populace need to recognize that every citizen with adequate skills, especially in Automobile Technology (AT) contribute more meaningfully to the well-being of the country. Automobile Technology is a programme offered in the Polytechnic that prepares graduates for basic engineering principle and technical skills in order to support engineers and other professionals that are engaged in developing, manufacturing, design, calibration of instrument, inspection and maintenance procedures (Houghton, 2014). In other words, Automobile Technology prepares graduates with technical skills necessary to enter careers in manufacturing, maintenance and design of Automobile vehicles (Michael, 2010).

However, evidences showed that 80 percent of Automobile Engineering Technology graduates find it difficult to be self-employed after graduation in automobile industries and other related organizations. Adedokun (2003) explained that every staff employed in the company from Polytechnic need to be re-trained. Usman (2009) stressed further that graduates employed in the industries cannot perform except, graduates were re-trained. Yet, the objectives of Higher National Diploma in Automobile Engineering Technology Programme stated that, graduate are expected to possess adequate skills in engineering design of automobile vehicle parts, and interpretation of engineering drawing of automobile vehicle components, after graduation (National Board for Technical Education, 2003). Inyiagu (2005) emphasized also that graduate of Automobile Engineering Technology lack adequate

skills to establish on their own and being employed in related organizations. Moreover, the programme which the graduates trained, were last reviewed 12 years ago. This implies that graduates were using obsolete programme for their training which ought not to be. Therefore, there is need to assess the skillfulness of Higher National Diploma Graduates of Automobile Engineering Technology in design of automobile vehicle parts and interpretation of engineering drawing of automobile vehicle components. The main purpose of the study is to assess skills of Higher National Diploma Graduates in Automobile Engineering Technology in the North Central States of Nigeria. Specifically, the study ascertained the skillfulness of Higher National Diploma Graduates of AET in the:

(i) Engineering design of automobile vehicle parts.

(ii) Interpretation of engineering drawing of automobile vehicle components.

The following research questions were developed to guide the study.

(i) How skillful are the Higher National Diploma Graduates of Automobile Engineering Technology in the engineering design of automobile vehicle parts?

(ii) How skillful are the Higher National Diploma Graduates of automobile engineering technology in the interpretation of engineering drawing of automobile components?

The following hypotheses were formulated and tested at 0.05 level of significance.

H_{01} There is no significant difference in the mean ratings of Heads of Departments, Supervisors and Graduates on the skillfulness of Higher National Diploma graduates in engineering design of automobile vehicle parts.

H_{02} There is no significance difference in the mean ratings of Heads of Departments, supervisors and graduates on the skillfulness of Higher National Diploma Graduates in the Interpretation of engineering drawing of automobile components.

Curriculum was a comprehensive plan for an educational training programme and courses that offer new improved manpower to fulfill the rising needs of dynamic society (Olaitan, 2003). Audu (2008) explained also that curriculum in technology education was the totality of experience knowledge, skill and activities that were systematically planned to advance students for gainful employment in any chosen profession. To realize these objectives, there is need for frequent curriculum evaluation in view of new innovations in technologies in resent time. Evaluation is an act of assessing programme, in order to judge its value, quality, importance or condition. Evaluation according to Bamberger, Rugh and Marbry (2012) involves systematic, evidence-based inquiry that can describe and assess any aspect of a programme. Evaluation uses a wide variety of both quantitative and qualitative methods, providing more comprehensive information about what is taking place, why and whether it is appropriate or not and to provide guidance for future directions. Hence, the purpose of evaluation of the performance of Higher National Diploma Graduates of automobile engineering technology is to find out the effect of the training, graduates receive through follow up and impact evaluations which are subset of ultimate evaluation.

Theory or model is a set of principle that is hypothetical. White (2010) stated that model is an assumption or accepted principle and rule. Though several models were reviewed, but Tyler's model was considered relevant to the study. The reason is that Polytechnic education programme was established with aims and objectives to be achieved, while Tyler's model for curriculum evaluation concentrates on: objectives, selecting learning experience, organizing learning experience and evaluation of student performance. The key emphasis of Tyler's model of curriculum evaluation was Instructional objectives and comparing of student performance data with the objectives standard.

The study adopted cross-sectional survey design. The accessible population for the study was), which comprised 70 Heads of Departments, 60 Supervisors and 430 Graduates working in the

organizations. Since the accessible population was small, there was no need for sampling. To establish the validity of the instrument, the research instrument was subjected to face and contents validity

The results of the mean and standard deviation of the graduates' skills in the engineering design of automobile vehicle parts and interpretation of engineering drawing of automobile vehicle components were presented in table 1 and 4 based on research questions. The hypotheses were also tested in tables 2, 3, 5 and 6 using One-Way ANOVA and Post HOC Test of Homogeneous Subset statistics at 0.05 level of significance.

Results

Research Question 1 and Hypothesis 1.

How skillful are the Higher National Diploma Graduates of automobile engineering technology in the engineering design of automobile vehicle parts?

Table 1:

Mean Ratings of Skillfulness' of HND Graduates in Engineering Design of Automobile Vehicle Parts in North Central States.

S/N	ITEM	$\bar{X}a$	SDa
1.	ability to: Set plain sheet on drawing board with the aid of the square and paper management	3.21	0.67
2.	Measure dimension of complex shapes and design	3.12	0.62
3.	Draw journal, thrust and roller bearings	2.89	0.74
4.	Draw various gears: bevel and spur	2.60	1.06
5.	Develop various shapes cycloid, parabola and hyperbola	2.69	0.92
6.	Design camlobes and cam followers	2.70	1.05
7.	Apply basic tools in Auto-CAD to design gear wheels	2.51	1.00
8.	Identify basic tools in Auto-CAD	2.76	0.92
9.	Identify physical properties of metal used to design chassis frame	2.78	1.03
10.	Identify mechanical properties of metal, used to design coil and leave spring	2.73	1.04
	Grand mean ($\bar{x}g$)	**2.79**	

Table 1: revealed that the respondents agreed with item 1 to 10 with a mean score ranging from 2.51 to 3.21. Since the grand mean (2.79) is above the cut-off point of 2.50, the respondents agreed that the graduates were skillful in engineering design of automobile vehicle parts. The 10 items had their standard deviation ranging from 0.62 to 1.06 which is less than 2.00, showing that the respondents were not too far from the mean and from one another in their responses.

The findings of the study validated the objectives of the National Board for Technical Education (2003) which stated that graduates of automobile engineering technology are expected to possess adequate skills in design of automobile vehicle parts after graduation. The findings concord with the findings of Marayan (2008) who stressed that skill in Computer Aided Design by the graduates makes the design of the automobile vehicle parts easier and faster.

Table 2:
One-Way ANOVA of mean ratings of Heads of Departments, Supervisors and Graduates Engineering Design of Automobile Vehicle Parts.

Source	Sum of square	Df	Mean square	Cal f value	Sign value	Decision
Between groups	3125.17	2	1,562.50			
Within groups	25426.53	607	41.89	37.30	0.00	Rejected
Total	**28551.70**	**609**				

P< .05
Key: DF = Degree of freedom

Table 2 indicated that the calculated F-value was 37.30 with level of significance 0.00. Sin the calculated value of significance (0.00) was less than the significance level of 0.05, this implies tha there was significance difference in the mean ratings of the respondents on the skillfulness of HN Graduates in engineering design of automobile vehicle parts. Table 3: Reveals where the significan difference lies.

Table 3:
Post Hoc-Test Analysis showing where the significance difference lies among the respondents.

Status	N	Subsets for Alpha = 0.05		
		1	2	3
Graduates	430	22.78		
Supervisor	70		38.13	
HOD	60			40.00
Significant		1.00	1.00	1.00

Table 3 showed that the ratings of Heads of Departments were the most significant with mea of 40.00 in subjects 3. Supervisors were the next with mean of 38.13 in subset 2, while graduates wer with mean of 22.78 in subset 1.

This might be as a result of the programme that graduates went through while in school, such a four months training in Student Industrial Work Experience Schemes (SIWES) and one year Industria Training (IT). Besides, government has done a lot by providing facilities and equipment in schools through the intervention of Tertiary Education Trust Fund (Tetfund). In addition, graduates skillfulness might be as a result of several years of experiences they had before going to school. Training and re-training with frequent evaluation by the Heads of Department might be of help to the graduates. The result is in line with the findings of Adedokun (2003) which revealed that training and re-training of polytechnic graduates improves their skills. Bata and Raphila (2008) also found that creating an evaluative system of appraising practical skills improves graduates skillfulness.

Research Question 2 and Hypothesis 2

How skillful are Higher National Diploma \Graduates of automobile engineering technology in interpretation of engineering drawing of automobile vehicle components?

Table 4:

Mean Ratings of Skillfulness of HND Graduates in the Interpretation of engineering drawing of Automobile components.

S/N	Item	Xa	SDa
4.	Read conventional representation of automobile components	2.71	0.96
5.	Interpret conventional representation of automobile components	2.80	0.93
6.	Identify diagrammatic representation of automobile components	2.64	0.89
7.	Translate information related to drawing into practical activities	2.71	1.01
8.	Interpret scale drawing of automobile components	2.59	0.97
9.	Interpret computer programme of automobile components	2.51	1.19
10.	Interpret oblique and isometric protections	2.59	1.14
11.	Interpret orthographic projections	2.68	1.08
12.	Identify basic tools used in AutoCAD	2.50	0.96
13.	Select appropriate tool to be used in AUTOCAD	2.73	1.00
	Grand Mean ($\overline{Xa}$)	**2.65**	

Table 4 showed that the respondents agreed with items 1 to 10 with a mean score ranging from 2.50 to 2.80. Since the grand mean (2.65) is above the cut-off point of 2.50. Indicating that graduates were skillful in the interpretation of engineering drawing of automobile vehicle components. The 10 items had their standard deviation ranging from 0.89 to 1.4 which is less than 2.00, showing that the respondents were not far from the mean and from one another in their responses. This might also be as a result of graduates interest and attitude towards work in their profession. The findings agreed with the findings of Zargari and Hayes (1999) who revealed that graduates that enter the work place related to their field of study and satisfied with the occupation, given to them, performed better. The findings holds similar view with the finding of Cecil (2001) and Madsen (2005) which stressed that skills in technical and engineering drawing help in the interpretation, of symbols and conventions.

Table 5:

One-way ANOVA of mean and Graduates in the Interpretation of Engineering Drawing of Automobile Vehicle Components.

Source	Sum of square	Df	Mean square	Cal. F Value	Sig. value	Decision
Between group	3610.66	2	1805.33			
Within group	28684.22	607	47.26	38.20	0.00	Rejected
Total	**32294.77**	**607**				

Table 5 indicated that the calculated F. value was 38.20 with Significance value of 0.00.Since the calculated value of significance (0.00) was less than significance level of 0.05, this implies that there was significance difference in the mean ratings of the respondents on the skillfulness of HND graduates in the interpretation of engineering drawing of automobile vehicle components. Table 6 reveals where the significance lies.

Table 6:
Post Hoc-Tests Analysis, showing where the significance difference lies among the respondents

Status	N	Subsets for Alpha = 0.05		
		1	2	3
Graduate	430	21.04		
Supervisor	70		37.25	
HOD	60			40.00
Significant		1.00	1.00	1.00

Table 6 revealed that Heads of departments were the most significant with mean ratings of 40.00 in subset 3, higher than other groups. The supervisors had mean of 37.52 in subset 2, while graduates were with the mean of 21.04 in subset 1. Reddy (2008) stressed that ability to read and interpret drawing was an important requirement for technicians in engineering drawing. Basant and Agrawal (2008) also stressed that interpretation of conventional drawing requires adequate skills and training.

Based on the major findings of the study, it was evident that graduates were fairly skillful in the application of using tools in AutoCAD to design automobile vehicle parts. The study revealed also that there was significant different among the respondents in the mean ratings of HND graduates of automobile engineering technology, in which the Heads of Departments rated the graduates higher. The implication of the study is that graduates that were skillful in the design of automobile parts and interpretation of engineering drawing now would later design complete automobile that would raise the name of this country and subsequently give Nigeria, recognition in the world. The findings also have implications because it serves as feedback for the stake holders such as: government, lecturers and graduates.

The following recommendations were proffered based on the findings of the study: Government should encourage the use of Auto CAD tools by providing more computers for the students in higher institutions to design, instead of using primitive drawing instruments such as Drawing board and Tee square. The competencies identified should be packaged for the training and retraining of new students of automobile engineering technology.

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EFFECT OF PRESENTATION MEDIA ON STUDENTS LEARNING OUTCOMES IN VISUAL ARTS

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Abstract

This study examined whether the use of the PowerPoint presentation (PPT) and the interactive Multiple Mouse (MM) presentation were more effective than the conventional method (CM) in influencing the students' learning outcomes in Visual Arts. This was based on the need to find adequate media and technology solution that would improve the teaching and learning of the subject Visual Arts and how these technologies can be most effectively utilized in Visual Arts education. The research design was a pre-test, post-test, control group quasi-experiment. The population consisted of Junior Secondary School three students (JSS3) in Ogun state. Purposive sampling technique was used in selecting three schools. Two of them were experimental groups that were exposed to PowerPoint and Multiple Mouse presentation while the third was the control. An intact class of 110 students was used in each of the selected schools. Two hypotheses were tested using the Analysis of Covariance. The findings revealed significant main effect of presentation media and conventional method (MM, PPT, & CM) on students' achievement in Visual Arts. However, there was no significant main effect on students' attitude to Visual Arts. The results also revealed mean gains across the three treatment groups. The study concluded that, since the presentation media and conventional method (MM, PPT, & CM) was effective. The study therefore recommended, amongst others, that PowerPoint and Multiple Mouse Presentations should be used in the teaching and learning of Visual Arts in the secondary schools.

Keywords: *Visual Art, Microsoft, PowerPoint, Multiple Mouse, Learning outcomes*

Introduction

The 9-year Basic Education Curriculum on Cultural and Creative Arts is a combination of all the various aspects of the arts that comprise; music, drama, dance and the visual arts including crafts. The integrated approach is emphasized in order to produce artists that would understand and appreciate the inter-disciplinary nature of the arts. (Obioma, 2007). This study is however interested in the Visual Arts aspect of the Cultural and Creative Arts Curriculum, which includes Drawing, Painting, Pattern and Design, 3-Dimensional Works, Crafts and Arts. The visual Arts programme is a synthesis of the traditional art of Nigeria (Arts and Crafts) and selected aspects of such basic art as drawing, painting, sculpture and design that has meaning and relevance to the students and society. (Irivwieri, 2009)

According to Lawal-Ojibara, (1991), Abdulrazaq, (1997), Irivwieri, (2009), Archibong, (2012), Art teaching in Junior Secondary Schools in Nigeria seems to be fraught with hindrances, the most common problems hampering effective implementation of its curriculum, as noted by the above authors include: inadequate space for creative arts classes, apathy on the part of students to the subject, lack of administrative interest, timetabling, lack of parental/community interest and support, lack of incentive to work , lack of materials, equipment, shortage of relevant textbooks and shortage of qualified art teachers. Research grants and other opportunities that can develop art educators and teachers are limited, if available at all. There is usual "mimicking" of art being capital intensive and that there are "better" subjects that need attention.

It is also apparent that there is lack of interest on the part of students to the learning of Visual Arts, as it has been observed that only few students offer the subject beyond the Junior Secondary School level. At the Senior Secondary School level, the number of students that enroll for Visual Arts in the final examinations is quite negligible and this eventually leads to a reduced number at the tertiary education levels. Such a situation seems to undermine arts teaching. From a survey carried out in 2010 of 50 secondary schools in Ogun state, with a population of 7,644 JSS 3 students, only 4% (334 students) of that number took Visual Arts in SSS 3 (Ministry of Education, 2013). The statistics from a study carried out by Lawson and Ajibade (2003) shows that out of the 2,866 school graduates in a selected group of secondary schools from 1998 – 2002, only 219 students took Visual Art as a subject in the Senior Secondary School Level. Archibong (2012) bemoans the crises facing the nation through a disturbing decline in the study and promotion of Visual and CreativeArts. He noted that this frightening development emerged as discourse at Tai Solarin University of Education (TASUED), during a conference on the Review of the Visual and Creative Arts Curricula, which took place from 11 to13 November, 2008. And that, almost four years after that conference, which revolved around the theme: Designing Suitable Creative Arts Curricula for Nigeria's Development in the 21st Century, things have simply become worse as far as art education and promotion are concerned in Nigeria.

There is no doubt from the fore going that there is need for effective teaching of Visual Arts as it would lead to the improvement of students' attitude towards the subject. The researcher believes most Arts teachers, especially in the secondary school system, are still imaging the curriculum after the style, content, and methods of their earlier education, rather than reflecting the reality of the contemporary times. It must also be emphasized that, effective teaching and learning of Visual Arts develops a complete and total individual (in cognitive, affective and psychomotor domain). Affective domain deals with the role emotions play in learning and the development of art appreciation values. Visual Arts teachers expect that students learn to value and appreciate Visual Arts as part of their learning. Smith and Regan (1999) (in Miller, 2005) have pointed out that any cognitive or psychomotor objective must add the affective components to it. The authors also state that a student's attitude toward a given course or subject area can be a contributing factor to his achievement in it. This especially holds true for the learning of Visual Arts, as in some cases attitude learning is the main objective of the instruction. In comparison to the plethora of studies showing improvement in students learning outcomes, using computer based technology, little has been documented relating technology integration in the teaching and learning of Visual Arts.

In the light of these, the question of how these technologies can be most effectively utilized in Visual Arts education is what must be answered; it also becomes necessary to find adequate media and technology solution that would improve the teaching and learning of the subject Visual Arts. As documented, low enrolment and general apathy are some of the challenges facing the study of Cultural and Creative Arts in Nigerian Junior Secondary Schools. At present, there is the situation of having just a few students continuing the study of Visual Arts at senior secondary level or the total absence of the subject at senior secondary in some schools in Ogun state. Granted that creativity is inborn, it must also be emphasized that effective and interesting teaching techniques have potentials of encouraging young learners to study of the subject, regardless of individual degree of talent or creative ability. It is the researcher's belief that the possibilities provided for by the multimedia dimension of the presentation media may proffer a solution.

A multimedia programme is likely to be more effective than one which relies on a single medium. It is possible that the positive outcomes achieved with the integration of ICT in teaching other school subjects may also be replicated with Visual Arts. This research therefore reports the impact the two types of presentation media (PowerPoint& Multiple Mouse) had on students' attitude and achievement in Visual Arts. With the prospect that such ICT driven strategies would improve enrolment and create more interest in the subject.

The study set out to examine:

1. Whether the use of the PowerPoint presentation and the Multiple Mouse presentation are more effective than the conventional method used in teaching Visual Arts.
2. The influence of the use of these presentation media on students' attitude towards Visual Arts.

The study generated and tested the following null hypotheses:

Ho_1: There is no significant main effect of treatment (presentation media – PPT, MM & CM) on students' attitude to Visual Arts.

Ho_2: There is no significant main effect of treatment (PowerPoint (PPT), Multiple Mouse (MM), and Conventional Method (CM) on students' achievement in Visual Arts.

echnology Integration in the teaching of Visual Art.

Knowing that the present generation of students are naturally keyed to technology, there is therefore a eed to apply a system which combines the best of traditional teaching with the latest developments in chnology. Art teachers and artists are now challenged to embrace and utilize these technology tools and nd means to implementing and using them in creative and critical ways. It is in this light that the researcher rongly believes that more appropriate methods of teaching Visual Arts using computer based technology ust be sought. In the teaching of art and design, the need to consider how ICT might be used alongside id or integrated with art practice and how to develop this new medium in a way that develops and extends sual understanding is important. Artists now use ICT to develop and create their works of Art. Therefore, have the broadest experience, pupils must also have access to ICT in relation to the artworks being eated. For instance, the art teachers use a digital projector that allows them to show techniques, like ouble-loading' a brush or shading, on the big screen. (Brooks 2010).

PowerPoint can be very effective to display pictures, diagrams and other visuals; the teacher has em ready and does not need to spend time to draw them on the board. Anulobi's (2012) study of the fectiveness of PowerPoint slides and chalkboard instructional delivery methods on students' performance Junior Secondary School Fine Arts revealed that students taught with PowerPoint slides presentation rformed better than those taught without the PowerPoint slides. There are many advantages to the use of s technology in the class, but technology used without the teachers understanding of what his/her goals :, and without a plan of reinforcement and with no real assessment, has no real value. PowerPoint as a ol for presenting information has always being used as a one-way medium, Mouse Mischief (multiple ouse presentation) makes Office PowerPoint 2007/2010 an interactive medium.

Mouse Mischief (multiple mouse presentation) integrates into Microsoft PowerPoint and allows teachers to create interactive presentations that engage student in the classroom. It is easy to use because it integrates into familiar PowerPoint technology; one does not have to spend time learning new skills to use it. Compared to other interactive classroom technologies such as smart boards, interactive white boards, among others, Mouse Mischief is very affordable, making it is easy on the classroom budget. A classroom can be set up to play multiple mouse presentation lessons without purchasing expensive hardware, it enables multiple people to use a single computer simultaneously by using common computer peripherals like mice, equipping teachers with technology teaching tools at an affordable cost. By combining conventional teaching techniques with the interactive benefits of Mouse Mischief, teachers are able to present a more engaging classroom experience.

Skinner (1954) discusses the potentials of mechanical devices providing immediate feedback on correctness of learner's response. Mouse Mischief is an alternative to expensive classroom response systems. Classroom Response Systems (CRS), also known as Student Response System (SRS) is a technological way to assess students. The SRS- empowered classroom provides the quantitative tools to influence the processing of questions and formulation of answers by the student. The questions come from a computer, and are displayed for each student to view. Each student can answer the test questions at his/her own pace and respond with a device (in this case 'a computer mouse'). A Bluetooth or infrared transmitter picks up the student's response and sends it to the computer, which stores the responses and can provide detailed reports. This system allows instructors to obtain immediate feedback from each student. The improvement in the teaching and learning of the subject Visual Arts can be facilitated by teaching methods that give immediate feedback on students' comprehension of the subject taught, these immediate feedbacks can be provided with the use of Multiple Mouse presentation such as Microsoft Mouse Mischief.

Methodology

The research design for the study was a pre-test, post-test, control group quasi-experiment
The dependent variables are the students learning outcomes with respect to
(1) Achievement in Visual Art.
(2) Attitude towards Visual Art.
The independent variable is the presentation media strategy at 3 levels
(1) PowerPoint presentation (PPT), - treatment group 1.
(2) Multiple mouse presentation (MM) – treatment group 2
(3) Conventional Method (CM) - control group

The population for this study consists of the Junior Secondary School three students (JSS3) in Ogun state. Junior Secondary Three (JSS3) was chosen because Cultural and Creative Arts is compulsory up to this level in secondary school and that was a deciding year, if they would be continuing the study of Visual art or not. Purposive sampling was used in the selection of schools based on some criteria one of which was the availability of a computer laboratory and students with basic knowledge of computer studies because prior familiarity with the Computer would help reduce the time required for training and the effect of novelty of the technology on the students. It was also to ensure possible continuity of the use of the technology after the end of the treatment.

Three Junior Secondary Schools that satisfied the criteria were purposively selected. In each of the three schools, intact classes of JSS3 were used: a total of one hundred and ten (110) students participated in this study. The schools were selected from 3 distinct locations in Ogun state in order to reduce interaction that could possible occur among the groups.

The PowerPoint slides were based on the Visual Art topics that were treated during the study (Elements of Art, Colour, Principles of Art, Traditional Nigerian Art & Response to Art) these topics were adopted from the National Curriculum For Creative And Cultural Art (NERDC 2006). For the experimental group assigned to Microsoft Multiple Mouse, a PowerPoint add-in called Mouse Mischief, which is used to create and play interactive, multiple-mouse presentations was used with the same PowerPoint slides created for the PowerPoint group. The interactive dimension enabled by Mouse Mischief application allows the students to point and click or pick and drag on the PowerPoint presentations. Questions requiring yes or no answers, multiple choice questions, and drawing activities were included in the slides. The Conventional method followed the conventional mode of presentation.

The Research Instruments used were theStudents Attitude to Visual Art Questionnaire (SAVA) The 25-item SAVA was designed to assess students' attitudes towards visual art. The survey instrument had the four-point Likert type scale with assumed equal intervals between points. The instrument scales for the items are 1= strongly disagree, 2= disagree, 3= agree, 4= strongly agree this was used to assess the degree of agreement or disagreement with the statements. The other instrument was the Visual Art Achievement Test. (VAAT) which were field validated Junior Secondary Certificate Examination past questions (2005-2012) that corresponded to the content of the topics treated during the study. The VAAT is 25 item multiple-choice questions with five options. To ascertain reliability of the Students Attitude to Visual Art Questionnaire (SAVA), and The Visual Arts Achievement Test (VAAT) instrument was administered on a sample of students that are not part of the main study. A test-retest method was used. The reliability coefficient of the attitude questionnaire gave the reliability co-efficient as 0.91. While that of the achievement test was 0.79.

A pretest was given to determine if any statistically significant differences exist among the groups at the beginning of the study. For all the treatment groups, the Students attitude to Visual Art questionnaire (SAVA), and Visual Art achievement test (VAAT) were administered. The data collected were analyzed using descriptive and inferential statistics. Means and standard deviation scores are the descriptive statistics used to show estimates of the post-test achievement and attitude scores according to the levels of presentation media. The formulated hypotheses were tested using the Analysis of Covariance (ANCOVA), using pre-test scores as covariates. The accompanying Multiple Classification Analysis (MCA) was used to explain the magnitudes of the post-test mean achievement and attitude scores across the various levels.

Discussion

The result revealed mean gains across the three treatment groups when the pre-test and post-test scores are compared, with the highest mean achievement gain from the multiple mouse presentation group. The group of participants taught using the multiple mouse presentation strategy recorded the highest post-test mean achievement score of 17.67 (S.D. = 3.59); this was followed by the participants taught using the power point presentation strategy whose post-test mean achievement score was 16.64 (S.D. = 3.54), while the conventional method recorded the least post test mean achievement score of 15.16 (SD=2.50).

Results for the test in Attitude showed the participants taught using the multiple mouse presentation strategy recording the highest post-test mean attitude score of 64.31 (S.D. = 6.45)followed by the participants taught using the power point presentation strategy whose post-test mean attitude score was 64.07 (S.D. = 8.30), while the participants taught using the conventional method recorded the least post-test mean attitude score of 63.62 (S.D. = 6.10). The result also revealed mean gains across the three treatment groups.

Table 1:
Summary of Analysis of Covariance of Students' Achievement Scores

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig. of F
Main Effects	800.819	1	800.819	93.045	.000
Covariates (pre-test)	142.744	1	142.744	16.585	.000
Treatment (PPT, MM, CM)	64.683	2	32.342	3.758	.027*

Note. * indicate significant F at .05 level R Squared = .378 (Adjusted R Squared = .255)

Hypothesis 1: There is no significant main effect of treatment (PowerPoint (PPT), Multiple Mouse (MM), and Conventional Method (CM) on students' achievement in Cultural and Creative Arts.

The result in Table 1 shows the main effect of presentation media on the students' achievement scores in Visual Arts. The result revealed significant outcome ($F_{(2, 91)} = 3.758$, $P < 0.05$), that is, the post-test mean achievement scores of the students exposed to the different presentation media are significantly different. As a result, the null hypothesis one that states that there is no significant main effect of treatment (PowerPoint (PPT), Multiple Mouse (MM), and Conventional Method (CM) on students' achievement in Cultural and Creative Arts is rejected.

Table 2:
Multiple Classification Analysis of Students' Achievement Scores

Variable + Category Presentation Media	N	Unadjusted Deviation	Eta	Adjusted for Independent + Covariates	Beta
1. Power Point (PPT)	28	- 0.96		1.40	
2. Multiple Mouse (MM)	45	- 0.02		1.80	
3. Conventional (CM)	37	- 2.23	.08	0.01	.28

Note. Grand Mean = 16.559

The result in Table 2 shows the magnitudes of the adjusted post-test mean achievement scores of students exposed to the three presentation media. The MCA revealed that with a grand mean of 16.559, the students exposed to multiple mouse presentation strategy recorded the highest adjusted post-test mean

achievement score of 18.359 (i.e. 16.559 + 1.80). This outcome thus revealed that the multiple mouse presentation strategy with the best adjusted post-test mean achievement score had more impact in improving students' achievement in Visual Arts.

Table 3:

Summary of Analysis of Covariance of Students' Attitude Scores

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig. of F
Main Effects	1734.414	1	1734.414	40.887	.000
Covariates (pre-test)	252.611	1	252.611	5.955	.017
Treatment (PPT, MMM, CP)	55.416	2	27.708	.653	.523

Note. R Squared = .234 (Adjusted R Squared = .082)

Hypothesis 2: There is no significant main effect of treatment (presentation media – PPT, MM & CM) on students' attitude to Visual Arts

The result in Table 3 shows the main effect of presentation media (i.e. PPT, MM and CM used as strategy in the study) on the students' attitude to Visual Arts scores. The result revealed no significant outcome ($F_{(2, 91)} = .653$, $P > 0.05$), that is, the post-test mean attitude to Visual Arts scores of the students exposed to the different presentation media are not significantly different. As a result, the null hypothesis two is tenable.

Table 4:

Multiple Classification Analysis of Students' Attitude Scores

Variable + Category Presentation Media	N	Unadjusted Deviation	Eta	Adjusted for Independent + Covariates	Beta
1. Power Point (PPT)	28	- 2.94		2.31	
2. Multiple Mouse (MM)	45	- 1.02		3.07	
3. Conventional (CM)	37	- 3.16	.03	1.74	.12

Note. Grand Mean = 63.654

The result on Table 4 shows the magnitudes of the adjusted post-test mean attitude to Visual Arts scores of students exposed to the three presentation media. The MCA revealed that with a grand mean of 63.654, the students exposed to multiple mouse presentation strategy recorded the highest adjusted post-test mean attitude score of 66.724 (i.e. 63.654 + 3.07). This outcome thus revealed that the multiple mouse presentation strategy with the best adjusted post-test mean attitude led to improved attitude to Visual Arts than the other presentation strategies used in this study. There was however no statistically significant difference in the post-test mean attitude scores of the students according to presentation media used as treatment.

In summary, the findings of the study revealed that there was significant main effect of presentation media on the students' achievement in Visual Arts. It was also observed that all the groups had improvement in learning outcomes after receiving their respective instructional strategies. Although it was observed that all groups made learning gains, the students exposed to multiple mouse presentation strategy recorded the highest adjusted post-test mean achievement score, followed by those exposed to the power point

presentation strategy, while the students exposed to conventional method recorded the least adjusted post-test mean achievement score.

It can be said that all the strategies used have the potency to improve learning in the classroom, therefore the approach of combining the possibilities provided by the multimedia presentation media with the conventional practice can lead to better teaching and learning. Oliver (2000) also asserts that by incorporating digital media elements, the students are able to learn since they use multiple sensory modalities, which would make them more motivated to pay more attention to the information presented and better retain the information.

This finding corroborates with the assertion of the multimedia principle which states that multimedia as part of instruction can significantly enhance student learning (Mayer, 2005). Zywno and Waalen (2002) quasi-experimental study in a course offered in a hypermedia-assisted mode found a statistically significant increase in academic achievement in the hypermedia mode, as compared with the conventionally instructed control group. These findings also corroborate Abass (2011) study which assessed the use of computer assisted instruction in enhancing students' creative ability in sculpture education, the results of data analysis showed that students instructed with computer graphic benefited more than their counterparts in conventional teaching methods. It was concluded that application of computer in learning environment has considerable influence on the student's performances in sculpture. Abass (2011) study on the use of computer technology in the teaching and learning of graphic arts findings revealed that computer technology enhanced the teaching and learning of Graphic arts. The study concluded that computer would contribute immensely to the teaching and learning of graphic arts in schools. Hastings (2000) also found higher grades in two PPT conditions (PPT lecture &PPT lecture with notes) compared with an overhead lecture condition.

Although both of the presentation media used as instructional strategies in this study had greater effect on the learning outcome than the conventional method, the students exposed to multiple mouse presentation strategy recorded the highest adjusted post-test mean achievement score, this can be attributed to the interactivity enabled by the Microsoft mouse mischief add-on, the students were not mere passive recipients of information but were able to interact with the PowerPoint presentation, leading to active participation and more engagement in the learning process which equally led to greater effect on learning.

In the contrary to the findings of significant main effect of Presentation media on the students' achievement in Visual Arts, it was revealed that the post-test attitude score of Visual Arts students exposed to the different presentation media were not significantly different. Although the MCA revealed that the students exposed to multiple mouse presentation strategy recorded the highest adjusted post-test mean attitude score followed by the students exposed to power point presentation strategy, while the students exposed to conventional method recorded the least adjusted post-test mean attitude score. This outcome thus revealed that the multiple mouse presentation strategy with the best adjusted post-test mean attitude had the highest impact that led to improved attitude to Visual Arts than the other presentation strategies used in this study. Smith and Regan (1999) in Miller (2005), state that a student's attitude toward a given course or subject area can be a contributing factor to his achievement in it. This statement particularly holds true for this study as the students exposed to the multiple mouse presentation, having the highest improved attitude to visual arts also had the best adjusted post test mean achievement score compared to the other presentation strategies.

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UNIVERSITIES' SOCIABILITY IN SOCIAL MEDIA ERA TOWARDS SUSTAINABLE UNIVERSITY EDUCATION IN NIGERIA

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Abstract

Universities in Nigeria are struggling to gain prominence in the world and often ranked in the lower rung of the ladder. Social media offer universities a formidable presence as they are utilized by higher ranked global universities. In this study, the sociability of universities in Nigeria is premised on how these universities use social media to enhance their presence, visibilities, engagement and interactive approaches for higher global ranking and development. Thus, this study investigated the sociability of universities in social media era for sustainable development of university education in Nigeria. The research type was an online survey method where data from Nigerian Universities Commission (NUC) were used to identify 143 accredited universities in Nigeria. Five social media sites served as the measurement scale for universities' sociability. Three research questions were raised and one research hypothesis was formulated. Percentage and frequency counts were used to answer research questions 1 & 2 and result was presented in a bar chart. Research question 3 had corresponding hypothesis which was tested and analysed with chi-square at 0.05 critical level of significance. Findings revealed that the sociability of Nigerian universities is low and that university generation does not significantly differentiate sociability of Nigerian universities on social media. In this vein, this study recommended among others that universities need to shed the lukewarm attitude to social media use and embrace this phenomenon in order to cease the initiative and chart a beneficial course of using social media for the sustainable development of university education.

Keywords: *University Education, Social Media, Sociability, Sustainable Development*

Introduction

The tremendous growth of internet penetration has been witnessed across the globe, Nigeria inclusive. In 2013, the internet penetration in Nigeria was 38%, this percentage increased to 45.1% in 2015 (Okunoye & Ilori, 2016). This implies that about 76million Nigerians out of 170million population have access to the internet. Recent advancement in internet technology is synonymous with information sharing, characterised by the proliferation of web 2.0. This is also referred to as the rebirth of the internet which allows the creation and exchange of user-generated contents which depicts the current information age as the aeon of social media. The social technology tool that provides socialisation across the globe with unlimited possibilities is termed social media. This fusion of technology and social interaction for an effective socialisation process is a noticeable phenomenon of most definitions of social media. Social media is a term that have been employed to describe the information, community and collaborative features of wikis (e.g. Wikipedia), blogs (e.g. Blogger and WordPress), video hosting platforms (e.g. youtube, vimeo, vine), photo-sharing platforms (e.g. Instagram, Snapchat, Pinterest, Flickr), instant messaging platforms (e.g. Whatsapp,

Blackberry Messenger), microblogs (e.g. Twitter), and social networking platforms (e.g. Facebook, Google+).

From time immemorial, sociologists identified the protagonists of social interaction, networking and their dynamism as an important part in the cyber aeon. Hence, social media is seen as more of sociology and psychology than technology (Solis, 2007). The theoretical underpinning of social media in this study can be traced to George Simmel's structural approach to social interaction which stated that society arises from the individual and the individual arises out of the association. By this, social media interactions shape social structure which in turn shapes belief, attitude, behaviour, action, outcomes of individuals. The structure, content, and functions of social media ties constitute the complete social enquiry (Bryant & Peck 2007). In centuries gone by, Aristotle proclaimed that man is a social animal who networks with others to form a human community (Pachucki, Lena, & Tepper, 2010). Social media is a characterization of the human network which in a way, have brought people and groups closer to one another, whereby linking the people within and between groups culturally.

Universities in Nigeria are struggling to gain prominence in the world and often ranked in the lower rung of the cadre as shown in Figure 1.



ranking	World Rank	University	Ref.	Presence Rank*	Impact Rank*	Openness Rank*	Excellence Rank*
1	1335	University of Ibadan		3468	1302	1617	1715
2	1738	Covenant University Ota		1682	1621	1943	2885
3	1906	Obafemi Awolowo University		1276	2542	2519	2534
4	2613	University of Lagos		2005	6118	2709	2521
5	2652	University of Nigeria		2986	5817	1474	2885
6	2840	University of Port Harcourt		8692	3231	2274	3459
7	2914	University of Agriculture Abeokuta		7854	5429	2489	3125
8	2965	University of Ilorin		5467	8232	2119	2941
9	3049	Ahmadu Bello University		4180	8499	2557	2546
10	3214	Federal University of Technology Owerri		14969	2447	4016	3860
11	3507	Federal University of Technology Akure		4814	9097	3087	2804
12	3513	Federal University of Technology Minna		10700	7827	2915	3125
13	3542	University of Benin		5311	7705	2655	3508
14	4064	University of Abuja		4516	3824	3861	5228
15	4070	Afe Babalola University Ado Ekiti		3181	3619	1819	5778
16	4079	Ladoke Akintola University of Technology		3998	11254	2551	3617
17	4119	Bayero University Kano		16937	8789	3151	3459
18	4291	University of Jos		3620	10219	3672	3939
19	4306	University of Uyo		22465	11467	2921	2751
20	4313	Nnamdi Azikiwe University		10289	11286	2259	3617

Figure 1. 2016 Webometrics Ranking of Universities in Nigeria (Webometrics, 2017)

Figure 1 indicates that University of Ibadan with the 1st ranking in Nigeria is ranked 1335th university in the world. This implies that no university in Nigeria falls in the first 1000 position in the world. One factor in the world ranking of universities as shown in Webometrics (2017) is presence. Among the core mission of universities, in addition to formal training, is presence which are often enhanced through social media.

The presence of universities covers level of research, knowledge transfer, and international outlook. Social media offers universities a formidable presence as higher ranked universities in the world utilize social media sites. For instance, California Institute of Technology which is the number one ranked university in the 2015-2016 World University Ranking of Times Higher Education (2017) has 344,119 likes on its facebook page, over 37,600 followers on Twitter, more than 12,000 followers on Instagram, and 48,646 subscribers on Youtube;

Furthermore, University of Oxford that is ranked 2nd in the 2015-2016 World University Ranking of Times Higher Education (2017) has 79,290 subscribers on its Youtube channel, 3,237,211 Likes on its Facebook page, over 350,000 followers on Twitter, and 314,080 followers on LinkedIn and 177,843 alumni; the 3rd ranked university is Stanford University and has over 218,000 followers on Instagram, 608,031 subscribers on its Youtube channel, over 499,000 followers on Twitter and 1,179,853 Likes on its Facebook page. The aforementioned illustrates the sociability level of these universities. Sociability has been described as a form of art in relating with others making conversation, exchanging information, developing interaction forms, acquiring knowledge and information by enriching one's interest and goal (Pachucki, et.al, 2010). It builds a relationship between individuals, groups, communities, associations, etc. Sociability has several dimensions, prominent ones are contact, information and communication (social media), interaction, awareness of group, creating a community (Prasad, 2014). Social media sociability not only associate users but also establishes itself as a social reality extended and adopted for various purposes.

In this study, the sociability of universities in Nigeria is premised on how these universities leverage on the availability of social media sites to enhance their presence, visibilities, engagement and interactive approaches for higher global ranking and development. As the theme for development across the globe is premised on Sustainable Development Goals (SDGs). SDGs are United Nations (UN) initiative tagged as transforming our world: the 2030 agenda which is set between 17 aspirational goals (global goals) with 169 targets between them (UN, 2016). On the 15th of September, 2015, countries across the globe under the umbrella of UN adopted a set of goals to end poverty, protect the planet and ensure prosperity for all as part of a new sustainable development agenda. A timeframe of 15years was set for the target of each of the 17 aspirational goal to be achieved. University education seeks a medium to join the fray and social media through sociability of universities provides the platform.

Putting it in context, the sociability of universities on social media may offer universities a leeway to sustain university education in Nigeria and play prominent role in realizing the goals of SDG. In this vein, this study investigated the sociability of Nigerian universities in social media age for the sustainable development of university education. Thus, the following questions were raised to guide this study:

1. How many Nigerian universities are sociable on social media sites?
2. What is the rate of sociability of Nigerian universities on social media?
3. Does university generation differentiate the sociability of Nigerian universities on social media?

A research hypothesis was formulated for this study to be tested and analysed:

Ho_1: University sponsorship does not significantly differentiate the sociability of Nigerian universities on social media

Methodology

This study used an online research design. The online methodology evolves around different phases. The first phase involves the retrieval of data from the website of National Universities Commission (NUC) which is the regulatory body of all universities in Nigeria.

It revealed the year of establishment of all universities in Nigeria. This study adapted the template of Nwagwu and Agarin (2008) categorization of universities in Nigeria into five generations and re-classified these universities into three generations. The first generation universities were established with the birth of the University of Ibadan in 1962 to 1975 to meet the manpower need of post-independence, reconstruction challenges aftermath of the civil war as well as global increase in industrialization. The universities in the first generation are fully funded and owned by the federal government.

A need for a shift in orientation from broad based university education to specialized education motivated the birth of the second generation universities from 1980 to 1999, which focused on technology and agriculture. In addition, during Nigeria's second republic (1979-1983), the question of even spread of educational opportunities for all Nigerians became prominent in the political agenda of politicians, and this stimulated the birth of 19 second generation universities, which were state-owned. The third generation universities which consist of mainly private and mission universities, augmented by some newly established federal and state owned universities after 1999. It revealed that there are 13 first generation universities, 28 second generation universities and 102 third generation universities, for a total sample of 143 accredited universities for this study.

The second phase was the selection of social media sites to measure the sociability of Nigerian universities. There are numerous social media sites but five were selected on the basis of categories such as video hosting (Youtube, denoted as YT), professional (LinkedIn, denoted as LIN), microblogs (Twitter, denoted as TT), and social networking (Facebook and Google+, denoted as FB and G+ respectively). Photo-sharing sites (e.g. Instagram, Snapchat, Pinterest, Flickr) was another category in consideration but was dropped due to the minimal spread of usage among the universities. In the third phase, each university website as listed on the NUC website was used as the only source to search for their sociability on social media. This was realised through locating social media links on these universities' websites. It should be noted that locating these social media links was not considered as confirmation of sociability but these links had to be opened to validate its activeness and ascertain against its dormancy. As Micaiah (2014) noted, the links served as a way to eliminate extraneous discrepancies and minimisemargin of error. For instance, on the website of Bowen University, there are over 10 social media links including Delicious, Dig, Picasa, MySpace, Vimeo, and so on, but only 4 of the social media links, Facebook, Twitter, Youtube and Google+ were "Active" (A).

On the margin of error, this study had some limitations where some of the universities' websites were not listed (particularly, 2015 and 2016 established universities) and those listed on the NUC website were incorrect, dormant, suspended, network issues or hacked. In the case of "not listed" and "incorrect websites", this was resolved through google search for the correct and active websites (e.g. Police Academy, Kwararafa University, Wukari, Al-Hikmah University, Bells University of Technology, Benson Idahosa University). For network issues, the implication of unverifiable data persists, else, the data in this situation was ignored (e.g. Tai Solarin University of Education, Babcock University). On the issue of hacking, as at the time of research, Gombe State University and Evangel University were hacked. In another case, the links may not be hyperlinked (e.g. Macpherson University and in such situation, it is deemed "Not Active" (NA).

In this study, each of the five social media sites was assigned 20% of sociability if the link is available on the university website and active.

Three sets of scoring rate were used to determine the sociability level of universities in Nigeria. 0% - 39%: rated low level of sociability; 40% - 59%: average level of sociability; and 60% - 100%: rated high level of sociability. Research question one (*How many Nigerian universities are sociable on social media?*) and two (*What is the rate of sociability of Nigerian universities on social media?*) were answered with frequency counts and percentages and the results were presented in Table 1 and illustrated with a Bar Chart in Figure 2.

The full list of accredited Nigerian universities was retrieved from NUC website. Each university website as listed on the NUC website was used as the only source to search for their sociability on the five measured social media sites.

Table 1. Distribution of Nigerian Universities' Sociability on Social Media as at October 2016

S/N	LIST OF UNIVERSITIES	Year	Social Media Sociability						
			WB	FB	TW	YT	G+	LIN	Sociability
	FIRST GENERATION								
1.	University of Ibadan	1948	A	52,434	5,886	95	5,002	438	100%
2.	University of Nigeria, Nsukka	1960	A	29,829	3,290	91	NA	NA	60%
3.	Ahmadu Bello University, Zaria	1962	A	3,300	342	NA	NA	NA	40%
4.	Obafemi Awolowo University, Ile-Ife	1962	A	A	A	A	A	A	80%
5.	University of Lagos	1962	A	1,097	259	43	45	NA	80%
6.	University of Benin	1970	A	23,724	905	100	49	2,030	100%
7.	Bayero University Kano	1975	A	NA	NA	NA	NA	NA	0%
8.	University of Calabar	1975	A	11,765	68	NA	NA	NA	40%
9.	University of Ilorin	1975	A	45,773	3,903	113	391	NA	80%
10.	University of Jos	1975	A	2,800	135	NA	45	NA	60%
11.	University of Maiduguri	1975	A	35,633	759	NA	NA	NA	40%
12.	University of Port-Harcourt	1975	A	56,106	3,592	8	391	NA	80%
13.	Usman Dan Fodio University	1975	A	NA	NA	NA	NA	NA	0%
	SECOND GENERATION								
1.	Rivers State University of Science & Technology	1979	A	13,724	350	27	NA	NA	60%
2.	Federal University of Technology, Owerri	1980	A	18,534	2,299	NA	NA	NA	40%
3.	Ambrose Alli University, Ekpoma	1980	A	822	NA	NA	NA	NA	20%
4.	Federal University of Technology, Akure	1981	A	66,517	4,849	108	NA	NA	60%
5.	Modibbo Adama University of Technology, Yola	1981	A	6,548	NA	NA	NA	NA	20%
6.	Abia State University	1981	A	5,187	30	NA	NA	NA	40%
7.	Federal University of Technology, Minna.	1982	A	4,574	NA	NA	NA	NA	20%
8.	Ekiti State University	1982	A	1,672	220	NA	NA	NA	40%
9.	Enugu State University of Science and Tech., Enugu	1982	A	2,344	182	NA	168	NA	60%
10.	Olabisi Onabanjo University Ago-Iwoye	1982	A	7,711	NA	NA	NA	NA	20%
11.	Lagos State University, Ojo	1983	A	2,314	93	NA	NA	NA	0%
12.	Nigerian Defence Academy, Kaduna	1985	A	74,664	2,433	1,932	NA	NA	60%
13.	Abubakar Tafawa Balewa University, Bauchi	1988	A	NA	NA	NA	NA	NA	0%
14.	University of Abuja, Gwagwalada	1988	A	658	361	97	228	NA	80%
15.	University of Agriculture, Abeokuta	1988	A	35,933	3,828	NA	NA	NA	40%
16.	University of Agriculture, Makurdi	1988	A	68	NA	NA	NA	NA	40%
17.	Ladoke Akintola University of Technology, Ogbomoso	1990	A	38,960	9,188	142	183	215	100%
18.	University of Uyo	1991	A	1,301	NA	NA	NA	NA	20%
19.	Michael Okpara University of Agriculture, Umudike	1992	A	NA	NA	NA	NA	NA	0%
20.	Nnamdi Azikiwe University, Awka	1992	A	6,767	1,462	NA	NA	16,336	60%
21.	Benue State University, Makurdi	1992	A	563	51	NA	14	NA	60%
22.	Delta State University, Abraka	1992	A	NA	NA	NA	NA	NA	0%
23.	Imo State University, Owerri	1992	A	370	NA	NA	NA	NA	20%
24.	Adekunle Ajasin University, Akungba	1999	A	584	532	NA	NA	NA	40%
25.	Kogi State University, Anyigba	1999	A	4,112	87	NA	NA	NA	40%
26.	Babcock University, Ilishan-Remo	1999	A	27,344	1,081	NA	4	NA	60%
27.	Igbinedion University Okada	1999	A	5,814	35	NA	NA	79	60%
28.	Madonna University, Okija	1999	A	NA	NA	NA	NA	NA	0%
	THIRD GENERATION								
1.	Chukwuemeka Odumegu Ojukwu University, Anambra	2000	A	7,422	194	NA	NA	NA	40%
2.	Ebonyi State University, Abakaliki	2000	A	NA	NA	NA	NA	NA	0%
3.	Kano University of Science & Technology, Wudil	2000	A	11,967	266	NA	NA	NA	40%
4.	Niger Delta University, Yenagoa	2000	A	1,254	202	NA	NA	NA	40%
5.	Bowen University, Iwo	2001	A	231	38	40	7	NA	80%
6.	National Open University of Nigeria, Lagos	2002	A	1,188	422	NA	NA	NA	40%
7.	Adamawa State University	2002	A	NA	NA	NA	NA	NA	0%
8.	Nasarawa State University, Keffi	2002	A	1,861	1,410	NA	NA	NA	40%
9.	Benson Idahosa University, Benin City	2002	A	3,363	2,210	26	NA	NA	60%
10.	Covenant University, Ota	2002	A	74,903	8,934	297	146	NA	80%
11.	Pan-Atlantic University, Lagos	2002	A	8,077	5,799	13	NA	195	80%
12.	American University of Nigeria, Yola	2003	A	19,889	7,525	148	33	NA	80%
13.	Cross River State University of Science &Technology	2004	A	3,328	130	NA	NA	NA	40%
14.	Gombe State University, Gombe	2004	A	NA	NA	NA	NA	NA	0%
15.	Kaduna State University, Kaduna	2004	A	NA	NA	NA	NA	NA	0%
16.	Ibrahim Badamasi Babangida University, Lapai	2005	A	6,084	474	NA	NA	NA	40%
17.	Plateau State University, Bokkos	2005	NA	NA	NA	NA	NA	NA	0%
18.	Tai Solarin University of Education, Ijebu-Ode	2005	A	18,107	NA	NA	NA	NA	20%
19.	Ajayi Crowther University, Ibadan	2005	A	3,187	436	10	NA	NA	60%
20.	Al-Hikmah University, Ilorin	2005	A	21,673	117	60	NA	NA	60%
21.	Al-Qalam University, Katsina	2005	A	NA	147	14	NA	NA	40%
22.	Bells University of Technology, Otta	2005	A	NA	NA	0	NA	NA	20%
23.	Bingham University, New Karu	2005	A	NA	NA	NA	NA	NA	0%
24.	Caritas University, Enugu	2005	A	1,953	54	NA	NA	NA	40%
25.	Cetep City University, Lagos	2005	NA	NA	NA	NA	NA	NA	0%

26.	Crawford University Igbesa	2005	A	616	NA	NA	NA	NA	0%
27.	Crescent University, Abeokuta	2005	A	3,983	132	NA	NA	27	60%
28.	Kwararafa University, Wukari	2005	A	NA	NA	NA	NA	NA	0%
29.	Lead City University, Ibadan	2005	A	1,061	103	NA	NA	NA	40%
30.	Novena University, Ogume	2005	A	NA	NA	NA	NA	NA	0%
31.	Redeemer's University, Mowe	2005	A	11,491	173	27	NA	NA	60%
32.	Renaissance University, Enugu	2005	A	611	10	NA	NA	NA	40%
33.	University of Mkar, Mkar	2005	A	NA	NA	NA	NA	NA	0%
34.	Bukar Abba Ibrahim University, Damaturu	2006	A	5,778	94	3	NA	35	80%
35.	Kebbi State University, Kebbi	2006	A	90	NA	NA	NA	NA	20%
36.	Osun State University, Osogbo	2006	A	42,679	931	51	332	185	100%
37.	Umaru Musa Yar'Adua University, Katsina	2006	A	1,233	139	18	47	NA	80%
38.	Joseph Ayo Babalola University, Ikeji-Arakeji	2006	A	2,729	100	A	NA	NA	60%
39.	Federal University of Petroleum Resources, Effurun	2007	A	NA	NA	NA	NA	NA	0%
40.	Achievers University, Owo	2007	A	323	44	0	NA	NA	60%
41.	African University of Science & Technology, Abuja	2007	A	NA	NA	NA	NA	NA	0%
42.	Caleb University, Lagos	2007	A	NA	NA	NA	NA	NA	0%
43.	Fountain University, Oshogbo	2007	A	2,758	58	9	NA	NA	60%
44.	Obong University, Obong Ntak	2007	A	67,000	NA	NA	NA	NA	20%
45.	Salem University, Lokoja	2007	A	NA	NA	NA	NA	NA	0%
46.	Tansian University, Umunya	2007	A	552	NA	NA	NA	NA	20%
47.	Veritas University, Abuja	2007	A	2,077	41	NA	NA	NA	40%
48.	Wesley University of Science & Technology, Ondo	2007	A	NA	NA	NA	NA	NA	0%
49.	Western Delta University, Oghara	2007	A	1,128	NA	NA	NA	NA	20%
50.	Ondo State University of Science & Tech., Okitipupa	2008	A	NA	NA	NA	NA	NA	0%
51.	Taraba State University, Jalingo	2008	A	5,959	NA	NA	NA	NA	20%
52.	Kwara State University, Ilorin	2009	A	16,415	NA	NA	NA	NA	20%
53.	Sokoto State University, Sokoto	2009	A	893	61	NA	NA	NA	40%
54.	Afe Babalola University, Ado-Ekiti - Ekiti State	2009	A	3,902	2,321	17	NA	NA	80%
55.	Godfrey Okoye University, Ugwuomu-Nike – Enugu	2009	A	7,773	NA	NA	NA	NA	20%
56.	Nigerian-Turkish Nile University, Abuja	2009	A	5,454	408	NA	18	NA	60%
57.	Oduduwa University, Ipetumodu – Osun State	2009	A	NA	NA	NA	NA	NA	0%
58.	Paul University, Awka, Anambra State	2009	A	NA	NA	NA	NA	NA	0%
59.	Rhema University, Obeama-Asa-Rivers State	2009	A	41,392	110	NA	4	NA	60%
60.	Wellspring University, Evbuobanosa – Edo State	2009	A	1,120	18	NA	NA	NA	40%
61.	Akwa Ibom State University of Technology, Uyo	2010	A	42,670	3,212	103	NA	NA	60%
62.	Ignatius Ajuru University of Education, Rumuolumeni	2010	A	1,834	103	NA	NA	NA	40%
63.	Federal University, Dutse, Jigawa State	2011	A	6,002	233	NA	NA	326	60%
64.	Federal University, Dutsin-Ma, Katsina	2011	A	5,509	NA	NA	NA	NA	20%
65.	Federal University, Kashere, Gombe State	2011	A	NA	NA	NA	NA	NA	0%
66.	Federal University, Lafia, Nasarawa State	2011	A	3,347	NA	NA	NA	NA	20%
67.	Federal University, Lokoja, Kogi State	2011	A	9,778	NA	14	NA	NA	40%
68.	Federal University, Ndufu-Alike, Ebonyi State	2011	A	NA	NA	NA	NA	NA	0%
69.	Federal University, Otuoke, Bayelsa	2011	A	5,039	50	NA	NA	NA	40%
70.	Federal University, Oye-Ekiti, Ekiti State	2011	A	16,094	1,955	NA	NA	NA	40%
71.	Federal University, Wukari, Taraba State	2011	A	NA	NA	NA	NA	NA	0%
72.	Bauchi State University, Gadau	2011	A	NA	NA	NA	NA	NA	0%
73.	Adeleke University, Ede	2011	A	981	22	12	2	NA	80%
74.	Baze University, Abuja	2011	A	2,224	526	22	NA	NA	60%
75.	Landmark University, Omu-Aran	2011	A	20,479	1,408	110	93	NA	80%
76.	Samuel Adegboyega University, Ogwa	2011	A	3,528	49	1	NA	NA	60%
77.	Northwest University, Kano	2012	A	1,345	51	NA	NA	NA	40%
78.	Technical University, Ibadan	2012	NA	NA	NA	NA	NA	NA	0%
79.	Elizade University, Ilara-Mokin	2012	A	3,204	294	22	NA	NA	60%
80.	Evangel University, Akaeze	2012	A	30	NA	NA	NA	NA	20%
81.	Gregory University, Uturu	2012	A	2,765	85	A	NA	NA	60%
82.	Macpherson, Seriki Sotayo, Ajebo	2012	A	NA	NA	NA	NA	NA	0%
83.	Southwestern University, Oku Owa	2012	A	NA	NA	NA	NA	NA	0%
84.	Federal University, Gashua	2013	A	NA	NA	NA	NA	NA	0%
85.	Federal University, Birnin Kebbi	2013	A	2,436	NA	NA	NA	NA	20%
86.	Federal University, Gusau, Zamfara State	2013	A	7,186	NA	NA	NA	NA	20%
87.	The Police Academy Wudil	2013	A	NA	NA	NA	NA	NA	0%
88.	Jigawa State University	2013	A	NA	NA	NA	NA	NA	0%
89.	Ondo State University of Medical Science	2015	A	NA	NA	NA	NA	NA	0%
90.	Augustine University	2015	A	353	NA	NA	NA	NA	20%
91.	Chrisland University, Abeokuta, Ogun State	2015	A	NA	NA	NA	NA	NA	0%
92.	Christopher University, Mowe, Ogun State	2015	A	13,531	1,279	NA	NA	NA	40%
93.	Edwin Clark University, Kiagbodo	2015	A	1,170	21	NA	NA	NA	40%
94.	Hallmark University, Ijebu, Ogun State	2015	A	980	15	NA	NA	NA	40%
95.	Hezekiah University, Umudi	2015	A	1,958	27	NA	NA	NA	40%
96.	Kings University	2015	A	940	335	6	NA	NA	60%
97.	Michael & Cecilia University	2015	A	286	22	NA	1	NA	60%
98.	Mountain Top University	2015	A	1,396	29	NA	NA	59	60%
99.	Ritman University	2015	A	NA	NA	NA	NA	NA	0%
100.	Summit University	2015	A	41	176	NA	NA	2	60%
101.	Edo University, Iyamho	2016	A	284	14	1	NA	NA	60%
102.	Eastern Palm University,Ogboko, Imo State	2016	NA	NA	NA	NA	NA	NA	0%

Keys: *Website – Web, Facebook – FB, Twitter – TT, Youtube – YT, Google+ - G+, LinkedIn – LIN, Active – A, Not Active - NA*

Source: *Field Survey (2016)*

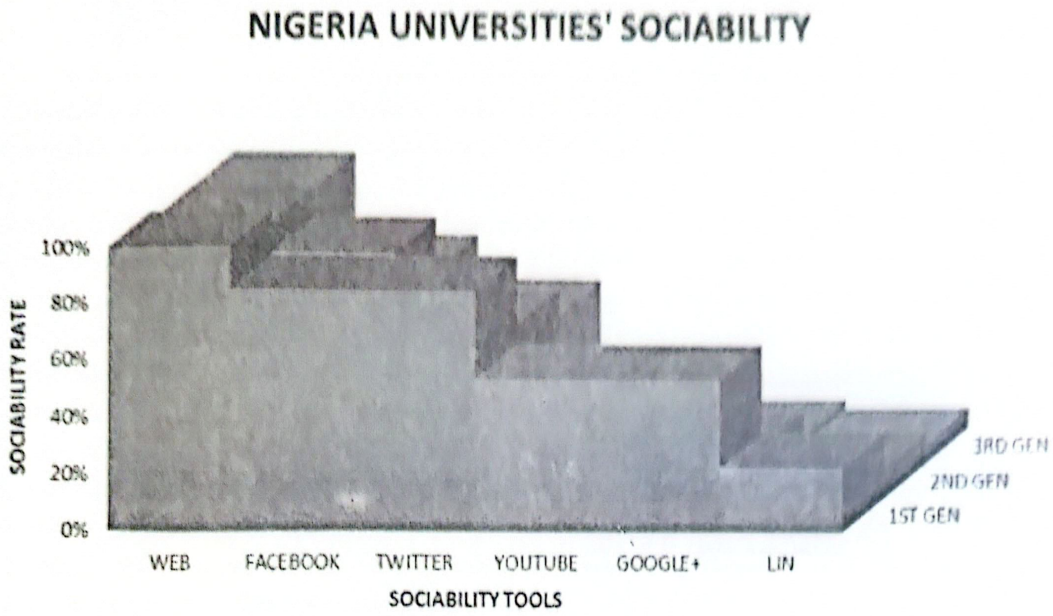

Figure 2. Rate of Nigerian Universities Sociability (*Field Survey, 2016)*

Evidence from Table 1 reveals that the 143 accredited universities (First Generation – 13, Second Generation – 28, Third Generation – 102) in Nigeria were used as sample in this study. Data presented Table 1 which was illustrated with a Bar Chart in Figure 2 show that out of 13 first generation universities, 13 (100%) have active websites, 27 (96.4%) out of 28 second generation universities have active websites and from 102 third generation universities, 98 (96.1%) have active websites. The data also reveals that 11 (84.6%) out of 13 first generation, 24 (85.7%) out of 28 second generation and 69 (67.6%) out of 102 third generation universities have active Facebook links. It further shows that 11 (84.6%) out of 13 first generation, 17 (60.7%) out of 28 second generation, and 53 (51.9%) out of 102 third generation universities are active on Twitter. On Youtube, 7 (53.8%) out of 13 first generation universities, 5 (17.8%) out of 28 second generation universities, and 27 (26.4%) out of 102 third generation universities use this video hosting social media site. In the case of Google+, 7 (53.8%) out of 13 first generation universities, 5 (17.8%) out of 28 second generation universities, and 10 (9.8%) out of 102 third generation universities use this social media site. Lastly, 3 (23.1%) out of 13 first generation universities, 3 (10.7%) out of 28 second generation universities, and 7 (6.8%) out of 102 third generation universities are active on the professional social media site, LinkedIn.

Table 1 also indicates that Covenant University, Ota had the highest number of "Likes" on Facebook (74,903), closely followed by Nigerian Army Academy, Kaduna (74,664). Ladoke Akintola University of Technology, Ogbomoso has the highest number of "Followers" (9,188) on Twitter, with Covenant University, Ota amassing 8,934 "Followers". No university in Nigeria had 300 Youtube "Subscribers", as Covenant University, Ota is the highest with 297 "Subscribers". It should be added that Gregory University and Joseph Ayo Babalola University developed their own web TV where they upload videos of lectures, events and activities. Two of the 13 first generation universities (University of Benin and University of Ibadan) one (Ladoke Akintola University of Technology) of the 28 second generation universities and only one (Osun State University) of the 102 third generation universities gained 100% sociability. While 33 of the 102 third generation universities had 0% sociability. Although,

Obafemi Awolowo University, Ile-Ife do not have links to the measured social media sites, still, it scored 80% sociability because it designed a talk and video web app, KEDU for lecturers and students to connect.

It is only the 1st generation universities who scored above 50% in all (Facebook - 84.6%, Twitter – 84.6%, Youtube – 53.8%, Google+ - 53.8%) but one (LinkedIn – 23.1%) social media sites. Overall, 1st generation universities scored 60% which gives them a rating of high level of sociability. For the 2nd generation universities, they scored below 50% in three (Youtube – 17.8%, Google+ - 17.8%, LinkedIn – 10.7%) social media sites, and above 50% in two (Facebook – 85.7%, Twitter – 60.7%) social media sites. In the total rating for the second generation universities, a score of 38.5% was realized which falls in the category of low level of sociability. It was only on two (Facebook – 67.5%, Twitter – 51.9%) social media sites that the 3rd generation universities rated above 50% as it scored below 50% in the other three (Youtube – 26.4%, Google+ - 9.8%, LinkedIn – 6.8%) social media sites. The total rating of the 3rd generation is 32.5% which also falls under the category of low level of sociability. The overall sociability score of the universities in Nigeria is 36.2% which falls below 40% - 59% as stated earlier, placing the rating of universities at low level of sociability. This implies that universities in Nigeria have low sociability level and only few are sociable.

Research question 3 (*Does university sponsorship differentiate the sociability of Nigerian universities on social media?*) had a corresponding hypothesis (*University sponsorship does not significantly differentiate the sociability of Nigerian universities on social media*) hence, it was tested and analysed with chi-square at 0.05 critical level of significance. The output of the analysis was presented in Table 2

Table 2. Chi-Square Analysis of Universities' Sociability on the basis of Sponsorship

Sponsorship		Social Media FB	TT	YT	G+	LIN	df	Total	Cal. X^2 Value	Cal.Sig. (2-sided	Decision
First Gen	Observed	11	11	7	7	3	8	39	9.573	.296	Accepted
	Expected	15.7	12.2	5.9	3.3	2.0		39.0			
Second Gen	Observed	24	17	5	5	3		54			
	Expected	21.7	16.9	8.1	4.6	2.7		54.0			
Third Gen	Observed	69	53	27	10	7		166			
	Expected	66.7	51.9	25.0	14.1	8.3		166.0			
Total	Observed	104	81	39	22	13		259			
	Expected	104.0	81.0	39.0	22.0	13.0		259.0			

Critical Level of Significance. 0.05

Data from Table 2 unveils that the calculated X^2 value is 9.573 with the calculated significance of .296 computed at the critical alpha level of significance 0.05. Since the calculated significance (.296) is greater than the critical alpha level of significance (0.05), hence, the null hypothesis is therefore accepted. This implies that university generation does not significantly differentiate sociability of universities in Nigeria on social media.

Discussion of Findings

Output of analysis of this study reveals that few Nigerian universities are sociable and the sociability of Nigerian universities on social media is relatively low. This is in consonance with Botha, Farshid, and Pitt (2011) who reported that South African university brands are not distinctly positioned on social media and seem to currently have no concerted strategy for engaging its stakeholders in a particular social media. This might be likened to some universities who have developed a lukewarmapproach to the use of social media which stem from the negativity of social media usage.

But this may seem as short-sighted because of the rapid growth of social media and the evolving nature of social media sites. About time, universities provide an atmosphere of camaraderie that encourages teamwork and networking, and fun, rather than cut-throat competition. This atmosphere helps with recruiting the best new graduate students and also assists graduating students to land jobs with their top choice employers. Building an interactive and sociable university is an integral component of universities' educational mission. In many ways, university education has become an extremely competitive industry. Universities are being challenged to compete to recruit and retain students, academic and non-academic staff. The public is taking a stronger interest in the need to live in an area that offers everything they need in one, walkable and organised place and universities are competing against one another to develop their campuses to better suit their students' wants.

The outcome of analysis of this study also reveals that university generation does not significantly differentiate the sociability of universities in Nigeria on social media. This finding is in line with Botha, et al (2011) who reported that university brands in South Africa do not significantly stand out as being more prominent than the others in any one or even a few social media sites. In contrast, this finding is in disagreement with Horst.(2012) who observed a significant difference between larger and smaller universities in the United Kingdom. Permatasari, et.al (2013) who using Alexa Rank and Majestic Search Engine Optimization (SEO) also analysed that there are most significant differences in university ownership on the use of social media.

Implication

As societies rapidly develop into knowledge-based information economies, social media becomes a key driver of both economic competitiveness and social development. The proliferation of social media use in our everyday lives has transformed the way in which people socialise and do business and can change the way in which university education institutions communicate with stakeholders (applicants, students, staff, alumni and public). Fluency in the usage of social media should become a central pillar of university education, both implicitly in how information is shared and explicitly in preparing students for the global markets they will enter after graduation. Sociability of universities would not only sway vast amount of applicants in their university selections but also shift the developing focus of university education in the country and improve the recognition of universities across the globe.

Sociability of universities would amount to an industry change which will contribute to identifying and reinforcing of university education brand and strengthen the sustainable development of university education. The contribution of this study to knowledge is that it opened the pathway for further studies within the context of the intensity of sociability of Nigerian universities in social media aeon. Although these results may not be the last word on the tracking of universities' sociability but the findings are at least plausible on the face of it and they may be able to offer some relevant insights in a sparsely populated field of study (relationship between social media and education). By so doing, this study suggests the following on the basis of its findings:

1. University education institutions need to shed the lukewarm attitude to social media use and embrace this phenomenon in order to cease the initiative and chart a beneficial course of using social media for the sustainable development of university education.
2. Universities who already use social media need to improve the intensity of sociability on social media to engage and interact with stakeholders.
3. Sponsors of university education institutions need to offer universities the autonomy to create qualitative engagement and interactive ambience with stakeholders.

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USE OF DIGITAL LIBRARY SERVICES BY STUDENTS IN NIGERIAN UNIVERSITY LIBRARIES

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Abstract

This study investigated university students' use of digital library services in selected Nigerian university libraries. Specifically it examined the factors that influenced their use of the collections in the university libraries studied. The study covered six Federal university libraries in Nigeria. The libraries are those of University of Ibadan; University of Ilorin; Federal University of Technology, Owerri; Abubakar Tafawa Balewa University, Bauchi; Nigerian Defence Academy, Kaduna; and University of Uyo. The study involved 682 respondents drawn from the institutions, using cluster stratified random sampling method. Two sets of structured questionnaires were applied on the respondents (students and heads of libraries) coupled with structured interview. The study discovered that, students are not ignorant of the existence of the materials in and outside their libraries, while few of them knew of their stock in these libraries. The materials are not regularly consulted by those that are aware. The relevance of multimedia to study; library staff advice; and course demands are major influencing factors for use of the collections in the university libraries by students, while users cut across all the class of students. The following recommendations were proffered: both faculty members and librarians must work hand-in-hand to effect positive change in the use of multimedia materials available in the library, interest of the students must be stimulated towards the multimedia materials in university libraries by drawing the attention of both teachers and students to new arrivals; by making attractive displays and/or by organizing regular exhibitions outside the library. Good human relations between all concerned (students, teachers and librarians) must be established.

Key words: *Digital Collection, Academic Libraries, Library Users, User Study*

INTRODUCTION

Most academic institutions in Nigeria were observed to have a standard library with qualified librarians. However, interactions with some students in some of the institutions show rare evidence of ICT knowledge in library let alone their use. Therefore, to what extent is ICT services adopted by Nigerian students in higher institutions? To what extent has the system enhanced academic activities of the students and what challenges facing its application by students? In the light of these submissions, the study examined: Students awareness of Digital Library Services (DLS) in their libraries, the category of students using DLS in the libraries, the frequency of DLS usage, factors influencing usage of DLS in the libraries and challenges facing students' use of ICT in libraries.

Information Technology (IT) encompasses the notion of the application of computers to storages, retrieval, processing and dissemination of information, that is, the use of technologies especially computer system, digital electronics and telecommunications, to store, process and transmit information. The related term, Information and Communication Technology (ICT), arises as a result of the advancement in 'IT' that has partly led to the globalization of the world economy and requires seamless retrieval of information wherever it is provided, thus making communication and media essential parts of the technology. Communication among communities and between members of the community has been highly enhanced by international networking (internet), through electronic mail (e-mail) and Global System of Mobile (GSM) communication. ICT is a system for acquisition, processing, storage and dissemination of information by means of computers, office machines and telecommunications.

The computer provides the facilities for the transfer or communications of data and its application hence, Kuar (1996) observed ICT to be a network in information filed. To him it is a systematic organization and co-ordination of inter-connected libraries, documentation and information

centers for achieving greater economy and efficiency. The usefulness of multimedia resources as sources of reference to past and current information, coupled with technological advancement brought about the machine called computer and its accessories which has its advantages in terms of space and time. This made the use of multimedia materials indispensable.

Numerous forms of technology have been devised over the years to effectively handle information among which are radio, television, microforms, slides, film, etc. these are means with which some groups of people are only familiar but also comfortable to acquire information. Also, the use of these materials in learning is becoming a universal phenomenon. This is because experiences are abundant in visual stimuli and evoke the strongest responses in libraries or other learning situations.

According to Creaser (1980) the use of electronic media (part of multimedia collections) with some projectors make the whole nature of teaching and learning effective; enrich students' experience, and helping students in opening up a new world of challenging assignments and problem solving opportunity. To Erickson (1992), electronic media are interesting compelling springboard, which launch students into a wide variety of learning activities. Creative use of a variety of media according to him, It increases the probability that students learn more, retain better what they learn, and improve their performance of the skill.

In discussing the relevance of these materials in the library, Uche (1986), was of the view that they allow users to have variety of approaches, different experiences from that to be derived from reading a book, consolidate previous lectures, make services of experts available and break down emotional and intellectual barrier of learning.

The advent of CD-Roms as publishing medium for information of all kinds including encyclopedia, reference works, dictionaries, full text database and data banks (locally or internationally produced) has also enhanced the status of multimedia in library (Mohammed, 1999). According to Rowley (1995) CD-Roms have a major source of international information and communication that aid research works. To Fapohunda (1995), the adoption of computer in the new information age and, the development of its software connect users that care to multiple information sources from corporate proprietary database to generalized news services (such
as CNN), to Personal electronic mails services etc. However, Spoonly (1997) observed that, to a large extent, information technology in society as a whole is used only for mundane tasks with little effect to date especially on the actual learning process which continue to be eliminated by lectures and books of various forms. He noted that, multimedia shows promise of offering an alternative to lectures and books at a much reduced cost, and networks like internet permit a learner to search the world for information and knowledge.

Most academic institutions in Nigeria were observed to have a standard library with qualified librarians. However, interactions with some students in some of the institutions show rare evidence of ICT knowledge in library let alone their use. Therefore, to what extent is ICT services were adopted by Nigerian students in higher institutions? To what extent has the system enhanced academic activities of the students and what challenges facing its application by students? In the light of these submissions, the study examined: Students awareness of multimedia services in their libraries, the category of students using multimedia in the libraries;
the frequency of multimedia usage;factors influencing usage of multimedia in the libraries and challenges facing students use of ICT in libraries.

Current Trend of ICT In The Modern Libraries

One of the materials that facilitate academic works nowadays is information and communication technology (ICT) facilities. Acquisition and installation of ICT in any educational institution, and more importantly in the library, enhance search and access of members of the academic community to information. Apart from networks, quite a number of typical library based resources are available in on line, tapes and CD-ROMs which cover a variety of areas. This, according to Mohammed (1999) includes: bibliography and bibliographical references, periodicals, including abstracting and indexing. Their availability in library has been a source of information to library and library users.

Examining multimedia library as applied to Nigerian libraries, Ike (1982) stressed what needs to be done to improve the status. These include: Librarians becoming aware of the value of acquiring all media including audio-visual materials as sources of information for their users; actually acquiring relevant audio visual materials; proper organization of such collections they have acquired; and ensuring that the library clientele actually use the materials so organized.

The main objective of an information network is to promote avenue for effective utilization of information through sharing of resources by group of libraries based on acceptable agreements and policies.

The use of computer technology and telecommunications added new dimension to the concept of networking in the libraries. To Bada (2001), the goals and objectives of information technologies as relate to library system are to; increase the volume of work that can be performed, expand services without the need for additional staff, free staff from much routine work as possible, speed up process of materials, improve the quality of existing services, encourage better control over resources and services, encourage cooperation ventures among institutions, improve the status of library and librarians through effective performance and facilitates creation of data bases.

Kabala (2004) observed that, with ICT, staff and students can satisfactorily get answers to their queries within the shortest time, they can look up for items of interest in electronics encyclopedia, an article on particular subject from variety of publishers could be culled without having to buy the publication. To him, librarians can perform their functions more effectively by communicating with other users, worldwide. Internet can be used to obtain important resources for teaching and learning by sending out orders to publishers and producers of teaching materials and requirements at ease. File transfer, and protocol for journal articles, magazine etc can be down loaded.

Adetimirin (2007) observed that ICTs can facilitate communications between teachers and students. It also provides students with additional opportunities to write edit and undertake multimedia project but the adoption of the learning tools in higher education is dependent on awareness, availability and ability to use it.

Users and Use Study

Users' studies have been carried out by scholars to justify selection and collection of materials in libraries. This is by studying the characteristic of users to understand users' behaviours and to meet their information needs. The objective of use studies is to justify, explain or, extend library usage (Beeler 1975, Busha and Harter 1980). Use studies concern themselves on knowing what, and how the facilities and materials provided for users are utilized.

The importance of use studies to library management is that it keeps management informed of materials and services that are effectively put to use; identify problem area(s), meet users' needs and enhance efficiency through sound decision that requires some facts to effect change. Ochai (1977) quoting Whitely stated that, use studies have been effective in intelligent planning and so shall they continue to be in future because use study brings to light information which is crucially important for library.

Multimedia or Digital in librarianship cover "collections or materials that include kits, artifacts, audio, video and computer readable materials" (Feather and Sturges,1997). This according to Hick and Tillim (1970) furnishes the library patrons' access to knowledge in whatever form it is carried.

Traditionally, multimedia materials and contents have been used as teaching support materials thus; a lecture might be illustrated with slides, while the still projection materials have attention focusing values. With multimedia, concepts are easily comprehended. The numerous advantages from the use of computer control information retrieval system are also limitless. For instance, the advent of computers have brought about the use of CD-Rom in libraries, therefore, information that are got from sources like books, journals, and other reports are now in CD-Rom (Olaoye 1998). But how effectively are these materials and contents put to use by the students?

Akande (2004) identified that the educational use of internet is still very rudimentary, with heavy reliance on print materials. That no information communication technologies are used as such to deliver the content and provide students support. There are hardly any other resources such as audio or video materials to accompany the materials therefore attempt should be made to take advantages of the emerging and new information and communication technologies.

Corbett and Williams (2002) observed the student use of technology on education is expected to improve educational outcomes, increase skills in the use of technology and decrease in equalities between groups therefore the adoption and use of ICTs could facilitate access to unlimited and current information irrespective of geographical location and time.

Opaleke (2005) in separate studies highlighted factors such as non-availability of ready access to infrastructure, availability of facilities, up – grading equipment, dearth of competent manpower to handle all aspect of automation and poor maintenance of ICT system in libraries affect the effective use of ICT.

Going by the this background, it is obvious that, ICT is no longer new to the development of education in Nigeria as it has quite enormous advantages or benefits to users. Its acquisition, storage and utilization enhance academic activities. Use of ICT, from the review, largely depends on users' awareness, availability of facilities and acquisition of appropriate skills to use while maintenance and administration should be handled by competent manpower or staff (Kuar, 1996; Akande, 2000; Barraket and Scott, (2001); and Opaleke, 2005).

The very salient point of this review is that, ICT development or growth to education cannot be overemphasized while the usefulness to students on assignment undertakings, literature search, and self-learning are enamors and highlighted. To this end, a library activity, where one exists, enhances library productivity. However, it could only enhance educational growth when users have free access, training and devoted time to use (McMahon (1999); Bada (2001); Corbett and Williams (2002); Kabala (2004); and Adetimirin (2007).

Methodology

The study involved the twenty five (25) federal universities as at the time of this investigation. This is because they were more funded by Nigerian federal government while the libraries are supported regularly by Tertiary Education Trust Fund (TETFUND) Board. For this study, cluster stratified random sampling method was applied, because the set of federally owned university libraries was used, geopolitical zones of the country and generations of universities were considered in the selection. Any of the universities and respondents stood equal chance of being selected for the study. For the choice of the universities to select respondents, the university classification into generations prepared by Aguotu (1996) was adopted for use. While the six geo-political zones in Nigeria each with four universities located in the area except South West with five universities was equally considered in sampling selection.

Table 1: The result of the ballot selection

S/N	Name of University	Geo-Political Zone	Generation
1	University of Ibadan, Ibadan	South-West	1st Generation
2	University of Ilorin, Ilorin	North-Central	2nd Generation
3	Federal University of Technology, Owerri	South-East	3rd Generation
4	Abubakar Tafawa Balewa University	North-East	4th Generation
5	University of Uyo, Uyo	South-South	5th Generation
6	Nigeria Defence Academy, Kaduna	North-West	6th Generation

The respondents considered for the study were six librarians (Digital or University Librarian) and seven hundred and sixty-two students who were selected from the sampled universities. However, six hundred and eight-two (682) responses were found usable. Two sets of structured questionnaires were used coupled with a structured ten (10) item interview questions for the study. One was for each of the six university librarians in the six universities and the other was for the student users of the sampled libraries.

Data Analysis and Discussion

This part present the analysis of data collected and discuss in relation with existing literature on the subject. Part I, examines the opinion of respondents perception to provision of ICT resources in libraries while part 2 analyses the attitude towards use and usages.

PART I: Respondents' perception of ICT service in library

The respondents' perception of storage and use of ICT in the library were found out. This is to establish the respondents' concept of ICT collection and management in the library. Six hundred and eighty two (682) respondents opinion were sort on their perception of ICT services in the library on the data collated from respondents' responses. The analysis show that, the 682 (100%) respondents **strongly agreed** that with ICT both librarians and Clientele can: get answers to their queries within shortest time, checkup items of interest in e-packs and nets such as internet & intranet, afford access to published articles and research reports, Librarians can perform their functions more effectively by communication with other users worldwide, Link with collections of other libraries far apart, encourage the use of internet service in teaching/learning and sending orders to publishers producers, Journal articles, magazine etc can be accessed and down loaded, facilitate communication between librarians and clientele, teachers and students, Provide clients with additional opportunities to develop search skill, encourage better control over resources and services, improve the quality of existing services and speed-up process of materials and ease reorganization of recorded statistical presentation.

However, some respondents have descending opinion to ICT in library. For instance, 136 (20%) of respondents **sparsely agreed** that: ICT expands services without the need for additional staff, ICT increases the volume of work that can be performed and ICT free staff from much routine work as possible.

PART II: Respondents Use and Usage

Table 2 present student's awareness of multimedia collection and services in the library. This is because awareness in most cases creates accessibility to use.

Table 2:

Student's awareness of multimedia services in their libraries.

Status	Aware	Not aware	Total	%
Graduate	48	16	64	9.38
Undergraduate	287	331	618	90.61
Total	335	347	682	100.00
%	49.1	50.9	100	

Table 2 show that, 335 or 49.1% of the respondents were aware of the collection and services of multimedia in their library. 347 or 50.9% were not. Furthermore, the table shows the number and percentage of both graduate and undergraduate student's awareness of multimedia resources and services in their libraries. From this result, less than half of the respondents were not aware of this type of collection in the library. This suggests low awareness of the study. It further suggests that there were low level of publicity by the libraries on availability and training. To Ochai (1977) quoting Whitely, the use of library collection is effective through awareness creation as this to him brings to light information which is crucially important to library and the users.

Multimedia Usage in the library

It is one thing to be aware of existence of certain resources; it is another to use them. Therefore category of students using multimedia in the libraries is shown in the next table.

Table 3:

Student's awareness of multimedia services in their libraries.

Status	Science	Humanities	Total	%
Graduate	27	21	48	9.38
Undergraduate	125	791	204	90.61
Total	152	812	252	100.00
%	22.3	40.7	37.0	

Table 3, shows that all categories of students: science, humanities, graduates and undergraduates use multimedia resources in these libraries. Furthermore the table shows that, 252 or 37.0% of the 682 respondents used multimedia in library, while 430 or 63% of the total respondents did not. Of the 252 users, only 152 or 22.3% were science students and 812 or 40.7% were in the humanities. This result shows that an insignificant percentage of 37.0% use the resources. This could be as a result of lack of awareness as earlier noted in table 1 above. This result affirmed Akande (2004) which claimed that educational use of internet is still very rudimentary with heavy reliance on print materials and that no ICT are used as such to deliver it content or provide students support.

Frequency of multimedia usage

Table 4:

Frequency of multimedia resources usage by students.

Status	Regular	Occasional	None	Total	%
Graduate	5	42	16	63	4.34
Undergraduate	62	142	414	618	90.61
Total	68	184	430	682	100
%	10.0	27.0	63.0	100	

The table shows that, there are 68 or 10.0% regular users, 184 or 27.0% occasional users and 430 or 63% none users. This implies that, 252 respondents use the materials either regularly or occasionally. Of this figure 204 are undergraduates while graduates are 48.

Factors for multimedia usage in library

Certain factors were considered influencing use of ICT resources anywhere. Table 5 below presents nine factors to determine what influence students' use of multimedia in library. Three factors however were observed to have positively influence respondents use of the resources.

Table 5: Factors influencing usage of multimedia

Factors	Effect influenced (N%)	Not influenced (N%)
Application in the classroom	54 (21.4)	198 (78.6)
Teachers ref. to the materials in the library	45 (17.9)	207 (82.1)
Course Requirement	183 (17.9)	69 (27.4)
Relevance to assignment	214 (84.9)	38 (15.1)
Easy access to the collection	39 (15.3)	213 (86.5)
Awareness of multimedia services	76 (30.2)	176 (69.8)
Library orientation programme	34 (13.5)	218 (86.5)
Shelves arrangement	29 (11.5)	223 (88.5)
Library staff advice	86 (73.8)	66 (26.2)

Table 5 shows that, 183 or 72.6% of users were influenced by course requirements, 214 or 84.9% by relevance of the materials to assignments and 186 or 73.8% by library staff advice.Even though other factors had influenced students' usage of the materials, table 4, further shows that the numbers of respondents influenced were relatively very low compared to the three factors earlier mentioned.

Respondents' Suggestion for ICT Use

This research went further to sort respondents' opinion as to what improves their use of ICT in libraries. The respondents were of the following opinion: That ICT skill acquisition be made compulsory at secondary school level, ICT unit be established in the library, libraries should open for twenty-four hours, libraries should prepare lists of their electronic software subject by subject with abstracts to encourage use, standby generators should be provided for library to allow all time utilization of the ICT facilities in the library, ICT skill acquisition should be made compulsory at 100 or 200 level of the institution, faculty staff should have knowledge of ICT and contents of library stock for teaching/ learning exercise, library should be made to open for twenty-four hours, libraries should prepare lists of their electronic software subject by subject with abstracts to encourage use and standby generators should be provided for library to allow all time utilization of the ICT facilities in the library.

Summary of the Findings

From the tables 1-4 above, the finding shows that most of the undergraduates are not aware of the multimedia services available in their various university libraries; it also shows that those that are aware don't usually make use of them. Also there are factors that influence the usage of multimedia in the library such as listed in the table 4 which shows the level of influence on the users.

Low level of multimedia stock was observed from the libraries under study. The low level of stock in the libraries, were as a result of poor administrators' interest, funding, space, etc. This corroborates Opaleke (1998)'s assertion that problem of funds, space, personnel etc. posed limitations on the extent to which many libraries can be stocked with digital resources in this country. This situation prompted the Library Association (2004) to suggest improvement in this direction.

The limited level of use cannot be linked with the low level of awareness, because, awareness programs were actually organized. The program has its merits as this study showed that all segments of the students (graduate, undergraduate, science and humanities), used the multimedia materials in the libraries – showing a general level of awareness.

Users tend to avoid utilizing complicate materials going for less complicated ones like slides, microfilms, charts and maps according to the observation in this study. This could be due to the constraints which developing countries like Nigeria have in the use of information technology like the lack of technical knowhow, lack of the capability to operate them and the inability to build and manage services involved in the technology (Fasanya, 2000).

Furthermore, students may not find some of the materials useful as observed by Izang (1993), while poor quality data and inconveniences may be other reasons for students' attitude as observed by Hsich and Yee (1996). The collections, again, may not satisfy the curriculum as well as the cultural and general educational requirements of the students; as the library association (1973) again observed. The students are not totally ignorant of the usefulness of the multimedia resources available in the libraries since about 49% of the respondents (students) are actually aware of them and use them. Many of the libraries actually organized awareness programmes to sensitize users. However, it has little or no effect.

The major factors which influence the use of the multimedia in the Nigerian university libraries are: Library staff advice, student class assignment and the relevance of the resources to the students' area of study. With the analysis of the responses, it was obvious that, ICT system was yet to be embraced by the higher Institutions. This is a dangerous trend to the educational development of the nation. By now all the institutions were expected to have automated their library system and have reliable ICT section with such units like digital, automation, audio-visual, and archival site in the libraries with a minimum ratio of a computer to five library registered users. Such section should have a trained staff such as a computer expert or a technologist to train users and maintain the system. On space and number of ICT facilities, the library's ICT facilities in the institutions fall short of expectation even though no standard have been prepared for the requirements; hence the need for library extension or annex building to create space and accommodate enough ICT facilities.

Conclusion and Implications

Training on ICT facilities should be made compulsory at 100 and 200 levels in all Nigerian Universities. To be able to do this, Academic staff in faculties and librarians must work hand in hand to effect positive changes in the use of multimedia materials available in their library. Students must be stimulated and encouraged towards the multimedia materials in the library by calling their attention to new arrivals, making attractive displays and making exhibition in the library. This will enhance the use of ICT in the digital libraries and promote education.

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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, Behavioral 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 (Febuary, 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 behavioral intention, where behavioral 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.

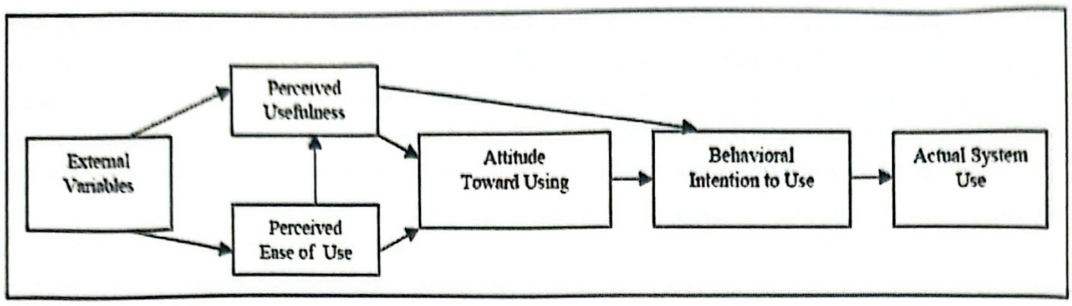

Figure 1: Original Technology Acceptance Model (Davis, 1989)

TAM theorizes that an individual's behavioral 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 behavioral intention to adopt a new technology. Other studies have also indicated that attitude directly and significantly influences behavioral 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 behavioral 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, behavioral attitude and behavioral 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 behavioral 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 behavioral 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 behavioral 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 behavioral 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 behavioral 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 behavioral 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 Behavioral Intention to Use a paperless classroom.	.001	.970	Supported
Students' Attitudes towards using a paperless classroom will significantly influence their Behavioral 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.

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EFFECTIVENESS OF INTERACTIVE HYPERMEDIA INSTRUCTIONS WHEN USED ALONE AND WHEN COMBINED WITH LECTURE METHOD ON SECONDARY SCHOOL STUDENTS' ACHIEVEMENT AND INTEREST TOWARDS PHYSICS IN MINNA, NIGERIA

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Abstract

Students' poor performance in physics has been attributed to ineffective and uninteresting instructional strategies. This study was therefore carried out to examine the effectiveness of interactive hypermedia instructions when used alone and when combined with lecture method on secondary school physics students' achievement and interest in Minna, Nigeria. A pretest, posttest quazi-experimental design was employed. Two research questions were raised to guide the study and two hypotheses were tested. A total of 71 physics students selected from intact classes of three purposively selected co-educational secondary schools that were randomly assigned to Experimental Group I (exposed to hypermedia instruction only), Experimental Group II (exposed to hypermedia + lecture method) and Control Group (taught through lecture method only) were employed for this study. Physics Achievement Test (PAT) and Physics Interest Inventory (PII) were used for data collection. Both PAT and PII were validated by experts and reliability coefficients of 0.76 and 0.81 were respectively obtained using Kuder-Richardson (Kr-21) and Cronbach Alpha's formula. Data gathered were analyzed using Mean, Standard Deviation and Analysis of Covariance and significance was ascertained at 0.05 alpha level. Findings revealed that significant difference exists in the mean achievement ($F(2, 67) = 62.010$, $p < 0.05$) and interest ($F(2, 67) = 128.230$, $p < 0.05$) scores of students exposed to hypermedia instructions only, hypermedia with lecture method, and lecture method only. It was therefore recommended among others that hypermedia instructions should be used to supplement conventional lecture method of teaching to improve students' achievement and interest towards physics.

Keywords: *Hypermedia instructions, Achievement, Interest, Physics, Lecture method*

Introduction

The focus of educational researchers all over the world today is to bring improvement into teaching and learning process. As such, various innovative strategies and methods have evolved to tackle the menace of students' poor performance especially in science-based subjects. One of such innovative strategy is the use of interactive hypermedia instructions which is the focus of this study. The rationale for carrying out the study, the methodology employed as well as findings and implications that emanated are presented in this article.

Academic and Psychological Efficacies of Hypermedia Instructions

The technological development of any nation lies in the study of science. Specifically, science is incomplete without physics which is a core and compulsory subject for all science students in Nigerian secondary schools. Physics has proven its benefits to mankind as almost every human activity and virtually every profession involves some elements of physics and the subject is a requirement for many specialized science and engineering courses in tertiary institutions (Falode, 2014, Javed, 2005).

Learning physics is a very complex cognitive task which requires a high level of commitment and effort on the part of the learner. Consequently students need to be motivated to cope with the learning of the subject. To cater for students' need in physics class, using interesting and stimulating instructional strategies become imperative. Hence, attention has shifted to the integration of Information and Communication Technology (ICT) driven learning processes. The rapid development of ICT hardware, software and telecommunication has increased the potential of technology in education of which computer-based instructions are integral parts (Batra, 2014). One form of computer-based interactive learning environment is the hypermedia. It is an innovation which utilizes CD-ROM based programs and instructional contents delivered via the World Wide Web. Hypermedia materials are comprised of multiple nodes containing various media forms such as text, sound, graphics and movies either individually or combined (Batra, 2014). When a multimedia program is developed in a hypertext environment, the resulting product is called hypermedia (Udouudoh & Dahwa, 2015). The structure of a hypermedia system enables users to move from one node to another at will, accessing information from nodes that are more associative and are delivered in a non- linear sequence, allowing the learner greater control and interactivity (Handal & Herrington, 2003). Amadieu, Tricot and Marine (2008) added that hypermedia systems allow free exploration of non-linear information which is expected to satisfy the students' needs as they will be able to navigate and process information according their own needs. Learning from hypermedia implies learners performing tasks useful for learning and also navigation tasks which entails students' active participation in selection, control and regulation in information reading (Amadieu & Tricot, 2006).

Findings from earlier studies have revealed that interactive computer-based learning environments have positive effects on students' performance and also improve their interest towards learning of science subjects. Zywno and Waalen (2001) examined the effect of hypermedia on achievement and attitude of students with different learning styles. They found that hypermedia had positive effects on students' achievement. Similarly, Mustafa and Sharif (2011) developed an adaptive e-learning hypermedia system and their finding after its' utilization in learning process revealed that students taught using the hypermedia performed significantly better than students taught without it. Also, finding of a study on the effect of interactive hypermedia program on students' achievement in Mathematics conducted by Batra (2014) revealed that hypermedia program led to better achievement in Mathematics. However, Falode and Onasanya (2015) in their study on the teaching and learning efficacy of interactive virtual laboratory package on selected Nigerian secondary school physics concepts found that there was no significant difference between the achievement of students taught physics through physical laboratory and virtual laboratory as both strategies were effective and enhanced achievement in physics by secondary school students.

Apart from the fact that interactive computer-based learning environments bring about improvement in students' performance, such environments also help to foster students' interest towards learning contents. Interest is an excitement accompanied by special attention to carry out a task. Ogundola (2014) described it as a fundamental factor necessary for supporting effective learning because it is capable of arousing students' curiosity. When students' curiosity are aroused, there would be desire to re-engage in learning activities, seek for more answers to questions, acquire more knowledge, understand better and invariably perform better in academic tasks. Students' interest in learning activities could be increased through the use of suitable teaching strategies and computer-based learning environments. Ogundola (2014) and Igoanugo (2013) in their studies found that suitable teaching strategies increased students' interest and

eventually led to higher achievement. Similarly, Abd-El-Aziz and Timoh (2015) found that students' interest was better stimulated and maintained through computer-based instruction.

Students' performance in secondary school physics examinations conducted by West African Examinations Council (WAEC) and National Examinations Council (NECO) has relatively been poor over the past few years. One of the major reasons attributed to such awful performance is the use of less stimulating and non captivating instructional strategies which prevent students from paying attention and also inhibit proper understanding of physics contents as well as poor skills in physics laboratory exercise (Aina, 2012; Falode & Onasanya, 2015). To cater for students' need in physics class therefore, using interesting and stimulating instructional strategies becomes imperative. One innovation that supports students' independent study and interactive engagement in learning process and that can enhance students' active involvement while learning physics is hypermedia instruction.

Despite the enormous benefits of hypermedia instructions in teaching and learning process and as buttressed by the findings of researchers that were cited in this work, who earlier found that hypermedia instructions improved students' achievement, no study was found to have been conducted on the effectiveness of hypermedia as it affects Nigerian secondary school physics students' achievement and interest towards learning physics. Hence, this study was carried out to determine the effectiveness of hypermedia instructions when used alone and when combined with lecture method on secondary school students' achievement and interest towards physics in Minna, Nigeria.

This study was carried out to determine whether researchers-developed hypermedia instruction would improve secondary school physics students' achievement and interest towards physics in Minna, Nigeria. Specifically, it sought to determine the differences in the:

i. achievement of students taught physics through hypermedia instruction only, hypermedia + lecture method, and lecture method only.

ii. interest of students taught physics through hypermedia instruction only, hypermedia + lecture method, and lecture method only.

The following questions were raised to guide the study:

1. What is the difference in the mean achievement scores of secondary school physics students exposed to physics through hypermedia instruction only, hypermedia + lecture method, and lecture method only?

2. What is the difference in the mean interest scores of secondary school physics students taught physics through hypermedia instruction only, hypermedia + lecture method, and lecture method only.

These two hypotheses were tested:

H_{01}: There is no significant difference in the mean achievement scores of secondary school physics students taught physics through hypermedia instruction, hypermedia + lecture method, and lecture method only.

H_{O2}: There is no significant difference in the mean interest scores of secondary school physics students taught physics through hypermedia instruction, hypermedia + lecture method, and lecture method only.

The study adopted a pretest and posttest quazi-experimental design. Three levels of independent variables (two experimental and one control) were investigated on students' achievement and interest towards physics. The independent variables were the hypermedia instruction, lecture method of instruction and the combination of the two. Students' achievement in physics and their interest towards the subject as a result of the manipulation of the independent variables were the dependent variables of this study. The investigation involved the use of researchers' developed achievement test and inventory to elicit needed information from physics students. To determine the learning effectiveness of the hypermedia instructions, and its' combination with lecture method, physics achievement test was administered as pretest and posttest on secondary school students before and after being exposed to the strategies. Also, interest inventory was administered before and after exposure to determine students' interest towards physics.

The population of the study consisted all secondary school physics students in Minna, Niger State, Nigeria while the target population was made up of all senior secondary school class one ((SSI) physics students in the 2014/2015 academic session. Purposive sampling technique was employed to select three co-educational secondary schools because of their equivalence in terms of physics laboratories, computer laboratories, being public schools, having enrolled students in SSCE physics for a minimum of five years, availability of ICT staff, physics teachers and students' exposure to computer-based learning. The three schools were randomly assigned to Experimental Group I (exposed to hypermedia instruction only), Experimental Group II (exposed to hypermedia + lecture method) and Control Group (taught through lecture method only). A total of 71 SSI physics students were employed from three intact classes from the purposively selected schools.

Two research instruments: Physics Achievement Test (PAT) and Physics Interest Inventory (PII) were used for data collection. PAT was developed by the researchers and it was administered as pretest and posttest. It consists of 25 multiple-choice objective items on the three secondary school physics topics (measurement and unit, fundamental and derived units, and motion) treated. Each question was followed by five options (A-E) out of which students were required to select the correct answer. Every correct answer was awarded one mark while every wrongly answered question was scored zero. The cumulative score of each student in the test was converted to percentage. Similarly, PII was developed by the researchers and was segmented into two sections (Sections A& B). Section A was designed to collect demographic information of the respondents while Section B consists of 15 items on student's interest towards learning physics. It was designed using the 4-point scale (namely, 1 as Strongly Disagree, 2 as Disagree, 3 as Agree and 4 as Strongly Agree). The questionnaire was also administered to the students in the three groups as pretest and posttest. PAT was validated by four physics teachers while one Guidance psychology expert and two science education experts validated the PII.

Hypermedia website was developed using Hypertext Preprocessor; an HTML surrounded scripting language, JAVASCRIPT and CSS programming language. The website contains three well-structured and interactive senior secondary school class one (SSI) physics topics: measurement and unit, fundamental and derived units, and motion, and students would navigate through the site by clicking on multiple links that direct them to other links where text, sound, animations, video and pictorial files can be viewed and studied. Special attention was given to the organization of the physics contents and navigational techniques since it is the user-friendly organization that represents the essential idea behind hypermedia. Similarly, learner-content, learner-learner and learner-teacher interactions enabled tools were embedded in the hypermedia site. The hypermedia website was developed by the researchers with the assistance of a programmer and web designer and it was validated by two computer experts, three physics teachers and two educational technology experts. Based on experts' suggestions, some links were re-directed, the background colour of the site was changed and typographical errors were removed.

A pilot study was conducted in a school within Minna but that was not selected for the main study. PAT and PII were administered once on 18 SSI physics' students and reliability coefficients of 0.76 and 0.81 were obtained for PAT and PII using Kuder-Richardson (Kr-21) and Cronbach Alpha formulas respectively. Hence, the instruments were considered appropriate for this study.

The researchers and two trained research assistants administered the research instruments to the students. The hypermedia website address was copied for the students and was able to learn physics online with the use of stand-alone computers that were connected to the internet in the computer laboratories of the schools used as Experimental Groups I and II. Students in Experimental Group I learnt physics through hypermedia website only, students in Experimental Group II were first exposed to lecture method before using the hypermedia website for supplementary instruction while students in the Control Group were taught the same physics topics by their teacher using lecture method only. PAT and PII were administered before and after the administration of treatments to the three groups as pretest and posttest and the administration of the treatments lasted for three weeks.

Data gathered from the administration of the research instruments were used to answer the research questions raised and also to test the two research hypotheses. Specifically, Mean, Standard Deviation and Analysis of Covariance (ANCOVA) were used and significant level was ascertained at 0.05 alpha level. The results obtained from the data are presented as follows to answer and test the hypotheses:

HO_1: There is no significant difference in the mean achievement scores of secondary school physics students taught physics through hypermedia instruction only, hypermedia + lecture method, and lecture method only.

Table 1:
Mean and standard deviation of achievement scores of experimental group I, II and the control group at pretest and posttest

Group	N	Pretest		Posttest		Mean Difference
		$\bar{X}$	SD	$\bar{X}$	SD	
Experimental I	25	21.36	6.55	60.20	8.81	38.84
Experimental II	24	31.00	7.02	72.50	7.75	41.50

Control	22	25.55	7.86	45.59	6.37	20.04

Table 1 reveals the mean and standard deviation of achievement scores of students taught physics in Experimental Group I (Hypermedia only), Experimental Group II (Hypermedia + Lecture Method) and Control Group (Lecture Method only). From the Table, it was observed that the mean scores of the three groups at posttest differ where Experimental Group II had the highest mean scores of 72.50 with standard deviation of 7.75, followed by Experimental Group I which had mean scores of 60.20 with standard deviation of 8.81 while the Control Group had the least scores at posttest with mean scores of 45.59 and standard deviation of 6.37.

Table 2:

Summary of Analysis of Covariance (ANCOVA) of posttest achievement scores of experimental group I, II and the control group

Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	8527.418	3	2842.473	48.976	.000
Intercept	13454.106	1	13454.106	231.815	.000
Covariate (Pretest)	210.765	1	210.765	3.631	.061
Main Effect (Treatment)	7197.861	2	3598.931	62.010*	.000
Error	3888.553	67	58.038		
Total	266578.000	71			
Corrected Total	12415.972	70			

*: Significant at 0.05 level

Table 2 shows the ANCOVA result of the comparison of posttest achievement scores of students taught physics in Experimental Group I, II and the Control Group. An examination of the Table shows ($F(2, 67) = 62.010$, $p < 0.05$). On the basis of this, hypothesis one was rejected. Therefore, there was significant difference in the achievement of students taught physics in Experimental Group I (those taught through Hypermedia only), Experimental Group II (those taught through Hypermedia + Lecture method) and those in Control Group (through lecture method only). Sidak post-hoc analysis was carried out to locate where significant difference exists as presented in Table 3.

Table 3:
Sidak post-hoc analysis of the posttest mean achievement scores of students in experimental group I, II and the control group

Treatment	Experimental I	Experimental II	Control
Exp. I (Hypermedia)	-	-9.92*	15.64*
Exp. II (Hypermedia+Lecture)	9.92*	-	25.56*
Control (Lecture)	-15.64*	-225.56*	-

*: Significant at p= 0.05 level.

Table 3 shows the Sidak post-hoc analysis of posttest mean achievement scores of students in Experimental Group I, Experimental Group II and the Control Group. The table indicates that significant difference exist between the mean scores of students in Experimental Group I and Experimental Group II (mean difference = -9.92). It also shows that significant difference exist between Experimental Group I and the Control Group (mean difference = 15.64) and also between Experimental Group II and the Control Group (mean difference = 25.56).

The implication of the analyses presented in Table 1, 2 and 3 is that the combination of Hypermedia and Lecture method improves students' achievement in Physics better than the use of Hypermedia only or lecture method only, while Hypermedia only also improves students' achievement better than lecture method only.

H_{O2}: There is no significant difference in the mean interest scores of secondary school physics students taught physics through hypermedia instruction, hypermedia + lecture method, and lecture method only.

Table 4:
Mean and standard deviation of interest scores of experimental group I, II and the control group at pretest and posttest

Group	N	Pretest		Posttest		Mean Difference
		$\bar{X}$	SD	$\bar{X}$	SD	
Experimental I	25	29.28	5.63	67.12	2.22	37.84
Experimental II	24	26.79	3.24	59.96	6.13	33.17
Control	22	22.50	5.71	40.09	6.21	17.59

Table 4 reveals the mean and standard deviation of interest scores of students taught physics in Experimental Group I (Hypermedia only), Experimental Group II (Hypermedia + Lecture Method) and Control Group (Lecture Method only). From the Table, it was observed that the mean scores of the three groups at posttest differ where Experimental Group I had the highest mean scores of 67.12 with standard deviation of 2.22, followed by Experimental Group II which had mean scores of 59.96 with standard

deviation of 6.13 while the Control Group had the least scores at posttest with mean scores of 40.09 with standard deviation of 6.21.

Table 5:

Summary of Analysis of Covariance (ANCOVA) of posttest interest scores of experimental group I, II and the control group

Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	9028.135	3	2842.473	48.976	.000
Intercept	7394.918	1	13454.106	231.815	.000
Covariate (Pretest)	0.002	1	0.002	0.000	.0992
Main Effect (Treatment)	6857.123	2	3428.562	128.230*	.000
Error	1791.414	67	26.738		
Total	236059.000	71			
Corrected Total	10819.549	70			

*: Significant at 0.05 level

Table 5 shows the ANCOVA result of the comparison of posttest interest scores of students taught physics in Experimental Group I, II and the Control Group. An examination of the Table shows ($F(2, 67) = 128.230$, $p < 0.05$). On the basis of this, hypothesis two was rejected. Therefore, there was significant difference in the interest score of students towards physics in Experimental Group I (those taught through Hypermedia only), Experimental Group II (those taught through Hypermedia + Lecture method) and those in Control Group (through lecture method only). Sidak post-hoc analysis was carried out to locate where significant difference exists as presented in Table 6.

Table 6:

Sidak post-hoc analysis of the posttest mean interest scores of students in experimental group I, II and the control group

Treatment	Experimental I	Experimental II	Control
Exp. I (Hypermedia)	-	7.17*	27.04*
Exp. II (Hypermedia + Lecture)	-7.17*	-	19.87*
Control (Lecture)	-27.04*	-19.87*	-

*: Significant at p= 0.05 level.

Table 6 shows the Sidak post-hoc analysis of posttest mean interest scores of students in Experimental Group I, Experimental Group II and the Control Group. The table indicates that significant difference exist between the mean scores of students in Experimental Group I and Experimental Group II (mean difference =7.17). It also shows that significant difference exist between Experimental Group I and the Control Group (mean difference = 27.04) and also between Experimental Group II and the Control Group (mean difference = 19.87).

The implication of the analyses presented in Table 4, 5 and 6 is that the use of Hypermedia only improves students' interest towards physics better than Hypermedia + Lecture method while the use of Hypermedia + Lecture method also improves students' interest better than the use of lecture method only.

Discussion of Findings

Finding that emanated from this study indicated that the combination of Hypermedia instruction and Lecture method improves students' achievement in Physics better than the use of Hypermedia only or the use of lecture method only, while the use of Hypermedia only also improves students' achievement better than the use of lecture method only. The bottom line is that hypermedia improved students' achievement in physics. This finding is in agreement with the earlier findings of Zywno and Waalen (2001) who found that hypermedia had positive effects on students' achievement; Mustafa and Sharif (2011) who found that students taught using hypermedia instruction performed significantly better than students taught without it; and Batra (2014) who found that hypermedia program led to better achievement of students in Mathematics.

Since this study was able to establish the fact that students' achievement in physics was improved when hypermedia was involved (whether alone or when combined with lecture method), it could be said that the improved achievement of students in physics when lecture method was used alongside hypermedia was as a result of the physical presence and role played by the teacher in the learning process in terms of monitoring, providing guidance and ensuring that students' did not deviate from the learning tasks to concentrate on other less productive tasks on the internet.

Another finding that emanated from this study indicated that the use of Hypermedia instruction only improves students' interest towards physics better than the combination of hypermedia and lecture method while the latter also improves students' interest towards physics better than the use of lecture method only. This finding is in agreement with the earlier findings of Abd-El-Aziz and Jimoh (2015) who found that students' interest was better stimulated and maintained through computer-based instruction. This finding does not contradict the views of Ogundola (2014) and Igoanugo (2013) that suitable teaching strategies increased students' interest and lead to higher achievement. The improved interest of students towards physics when hypermedia instructions were used could be as a result of the involvement of computer as medium of instruction in the learning process since it is widely believed that generally, children have likeness for computer.

From the findings that emanated from this study, it can be concluded that Hypermedia instruction is effective in teaching and learning of physics. Its' usage to complement lecture method improved students' achievement in physics better than the use of it alone or the use of only lecture method. Similarly, the use of hypermedia helped secondary school students' develop interest towards physics. When students' interest towards physics improves, there is no doubt that their performance in the subject will also be improved.

Implications

The following recommendations are made based on the findings that emanated from this study:

1. Physics teachers should supplement the popular conventional lecture method of teaching physics with hypermedia instructions as their combination would improve students' achievement in the subject.

2. Physics students should be encouraged to explore the interactive learning opportunities presented by hypermedia site. This will enable them develop interest towards physics and subsequently achieve better in the subject.

3. Since students that were exposed to hypermedia instructions achieved better than their counterparts that were taught physics through lecture method only, in situations where the combination of both is not possible, the use of hypermedia site should be given preference in learning of secondary school physics.

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TEACHER VARIABLES AND USE OF COMPUTER ASSISTED INSTRUCTIONAL MATERIALS (CAIM) IN UPPER BASIC SOCIAL STUDIES IN KWARA STATE

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Abstract

Teachers are the most important agents for the successful implementation of educational programme. They play vital roles on educational innovations and their application in teaching and learning process to assist learners in the acquisition of concrete and rewarding school experience, Social Studies teachers are not exception. This study examined teacher variables and use of Computer Assisted Instructional Materials (CAIM) in Upper Basic Social Studies in Kwara State. A descriptive survey research design was adopted. The population for this study covered all upper basic social studies teachers in Kwara State. Sample for this study comprised 150 respondents sampled through a stratified random sampling technique. The instrument was aquestionnaire titled "Computer Assisted Instructional Materials in Social Studies Assessment Checklist (CAIMSSAC)" with a reliability 0f 0.83. The data collected were analysed using percentage for the research questions while hypotheses were tested using t-test statistic. The findings of the study showed that CAIM are not frequently used by Social Studies teachers for instructional purposes. Only computer systems are occasionally used for information processing and storage. The study revealed that there is no statistically significant different between male and female (t=0.12, p>0.05), qualified and unqualified teachers (t=0.02, p>0.05), and experienced and less experienced Social Studies teachers (t=0.27, p>0.05) on the use of CAIM. Based on these findings, it was recommended that teachers should be encouraged to be computer literate and frequently use CAIM for teaching. Regular workshops, seminars, and in-service training should be organised to improve teachers' efficiency on the usage of CAIM.

Keywords: *Social Studies, Computer Assisted Instructional Materials, Upper Basic Schools and Teacher variables*

Introduction

Social studies is a social science subject being taught at lower, middle and upper basic levels of education in Nigeria. The subject appears to be the most popular social science subject at this level, because it has the potential to inculcate in learners right attitudes, values and moral that will make them to be effective citizens and contribute positively to the development of their country. Social Studies as a school subject tries to teach children the total experiences within their environment which they need to live in the world. The subject develops in learners appropriate skills and attitudes which will make them to become patriots and contributors to the community (Ogundare, 2010).

The content of the subject is dynamic based on the need of the society and particularly to accommodate changes in the areas of values, technology, social problems and educational philosophy of the country (Ogundare, 2010). The overall objectives of Social Studies at the basic education and junior secondary levels as stated by Nigerian Educational Research and Development Council (NERDC, 2007) involved develop the ability to adapt to his or her changing environment, become responsible and disciplined individuals capable and willing to contribute to the development of their societies, inculcate the right types of values, develop a sense of comprehension towards other people, their diverse cultures history and those fundamental principles that make them human, develop the capacity to recognize many dimensions of being human in different cultural, social contexts, develop a sense of solidarity and sharing based on a sense of security in one's own identity. These objectives could only be achieved when the subject is properly taught by teachers with appropriate instructional media.

It has been observed that teachers are not only teach learners with basic knowledge of Social Studies content but also with higher cognitive skills, such as problem solving and thinking skills that allow for self-

development, continuous learning and Information and Communication Technology (ICT) skills in order to meet up with global challenges. Social Studies is not left out in these challenges. To meet up with these, there is a movement from direct teaching as in the lecture method, note copying and dictations, where the learners are given contents to memorize and regurgitate to constructive instructional approach like Computer Assisted Instruction (CAI) and how they could be constructively use the approach for effective teaching and learning of Social Studies. The new approach is pupil or learner-centered. The learners are not treated as an empty vessel. They are credited with knowledge, skills and attitudes from the day they were born which requires development, encouragement, and motivation (NTI, 2010).

Teachers are the most important agents for the successful implementation of educational programme. For creative teaching, teachers must necessarily be conversant with educational innovations, new media and their application in learning process to assist learners in the acquisition of concrete and rewarding school experience. As expressed in the National Policy on Education (FRN, 2013) "no education system is expected to rise above the quality of its teachers" that is, the qualification and experiences of teachers are considered to be of paramount important in the implementation of school curriculum. Ogundare (2010) pointed out that the central point in the teaching of Social Studies is the resources, but the central value of the human resources is the resourcefulness. Effective learning of the subject is determined by teachers' skillfulness and resourcefulness in identifying and selecting method and instructional materials to teach the content of the subject. Therefore, it becomes imperative for teachers to possess a store of modern technology, practice and expertise in designing and use of the appropriate instructional materials for a particular lesson.

Computer is a modern technological tool designed to make life easier due to its speed, accuracy, and ability to store large quantities of information and to carry out large and complex operations (Ayoko, 2002). The use of computer is not new in education and it has been applied at various levels as Computer Assisted Instruction (CAI), Computer Based Education (CBE), Computer Managed Instruction (CMI) and Computer Supported Learning Aid (CSLA). Computer Based Education (CBE). According to MacArthur (2001) is the broadest term which refers to virtually any kind of computer use in educational settings. Therefore, there is need to incorporate it into the teaching and learning of Social Studies as a school subject.

Computer Assisted Instruction (CAI) is the means of using computer directly as a medium of instruction by a teacher in order to bring about effective teaching and learning that would encourage and permanent change in learners behaviours. It is the technique of using the computer to carry out the teaching and learning activities with the assistance of teacher (Odewumi, 2008). The merits of CAI include fostering a comparative group atmosphere, when two or more students are working together on a single computer, there is more collaboration and cooperation in problem solving. CAI tends to motivate the spirit of cooperation, an extremely powerful academic mix. It also provides simulation of instructional activities, bring about an indirect empowerment of students in computer operations, improving their performance and making teaching and learning more interesting and effective (Adedamola, 2015; Fagbemi, Gambari, Oyedum & Gbodi, 2014).

Upper basic Social Studies curriculum contains teaching and learning materials that are computer assisted instructional 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 Studies teachers to facilitate and enhance teaching and learning of Social Studies (NERDC, 2007).

Methodology

The descriptive survey research design was used 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 upper basic Social Studies teachers in the metropolis. A sample of one hundred and fifty upper basic Social Studies teachers was purposively sampled using stratified random sampling technique. A questionnaire titled "Computer Assisted Instructional Materials (CAIM) in Social Studies Assessment Checklist (CAIMSSAC)" was used for data collection. The questionnaire was divided into two sections. Section A deals with information about demographic data about the respondents while Section B contains items on Computer Assisted Instructional Materials and was on a three point Likert scale. To validate the instrument, copies of the questionnaire was given to experts in Social Studies in the Department of Social Sciences Education, University of Ilorin to ensure content validity. Its reliability was established using test-retest technique and a reliability index of 0.83 was obtained. Frequent counts and percentage were used to answer research question 1 while research question 2, 3 and 4 that have corresponding null hypotheses were tested using t-test statistic at 0.05 significant level.

Research Questions

1. To what extent do Social Studies teachers use Computer Assisted Instructional Materials (CAIM) for Social Studies in upper basic schools?
2. Do Social Studies teachers differ on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools based on gender?
3. Do Social Studies teachers differ on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools based on qualification?
4. Do Social Studies teachers differ on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools based on teaching experience?

Research Hypotheses

H_{O1}: There is no significant difference between male and female Social Studies teachers on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools.

H_{O2}: There is no significant difference between qualified and unqualified Social Studies teachers on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools.

H_{O3}: There is no significant difference between experienced and less experienced Social Studies teachers on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools.

Results

Questions 1: *To what extent do Social Studies teachers use Computer Assisted Instructional Materials (CAIM) for Social Studies in upper basic schools?*

In order to answer research question one, responses of Social Studies teachers on items 1 to 8 of the questionnaire on the extent of using CAIM were analysed using percentage to determine the extent. The result is shown in table 1.

Table 1:
Usage of Computer Assisted Instructional Materials (CAIM) by Social Studies Teachers

S/N	ITEMS	FREQUENTLY	SOMETIMES	NOT AT ALL
1	Computer systems	29 (19.3%)	52 (34.7%)	69 (46%)
2	Internet facilities	15 (10%)	26 (17.3%)	109 (72.7%)
3	Internet connectivity	16 (10.7%)	18 (12%)	116 (77.3%)
4	Computer-based Encyclopedia	14 (9.3%)	28 (18.7%)	108 (72%)
5	Computer-based simulated materials in social studies topics	32 (21.3%)	30 (20%)	88 (58.7%)
6	Instructional films in Social Studies	28 (18.7%)	37 (24.6%)	85 (56.7%)
7	Instructional Software in Social Studies	23 (15.3%)	33 (22%)	94 (62.7%)
8	Computer-based documentaries in Social Studies	23 (15.3%)	33 (22%)	94 (62.7%)

Results on the table 1 showed that Computer Assisted Instructional Materials (CAIM) are not frequently used by Social Studies teachers for instructional purpose as majority of the respondents did not use the CAIM at all.

Hypothesis 1: *There is no significant difference between male and female Social Studies teachers on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools.*

In order to test null hypothesis one, responses of male and female Social Studies teachers on the extent of using CAIM for teaching Social Studies were analysed using t-test statistic. The result was illustrated in table 2.

Table 2:
t-test Analysis of male and female Social Studies Teachers on Use of CAIM

Variables	NO	Mean	SD	Df	t-value	Sig. (2-tailed)	Decision
Male	66	12.11	1.77	148	0.12	0.72	NS
Female	84	14.73	3.82				

$P \geq 0.05$

Results in Table 2 showed that the calculated t-value 0.12, was obtained with p-value, 0.72 at alpha level of 0.05. Since the p-value is greater than 0.05 alpha level (0.72>0.05), therefore, null hypothesis 1 is hereby accepted. This implies that there is no statistically significant difference between male and female Social Studies teachers on the use of Computer Assisted Instructional Materials for Social Studies in upper basic schools.

Hypothesis 2: *There is no significant difference between qualified and unqualified Social Studies teachers on the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools.*

In order to test null hypothesis one, responses of qualified and unqualified Social Studies teachers on the extent of using CAIM for teaching Social Studies were analysed using t-test statistic. The result was illustrated in table 3.

Table 3:
t-test Analysis of CIP of qualified and unqualified Social Studies teachers

Variables	NO	Mean	SD	df	t-value	Sig (2-tailed)	Decision
Qualified teachers	130	12.12	3.85				
				148	0.02	0.99	NS
Unqualified teachers	20	12.10	3.70				

Results in Table 3 showed that the calculated t-value is 0.02, was obtained with p-value, 0.99 at alpha level of 0.05. Since the significance value is greater than 0.05 alpha level (0.99>0.05), therefore, null hypothesis 2 is hereby accepted. This implies that there is no statistically significant difference between qualified and unqualified Social Studies teachers on the use of Computer Assisted Instructional Materials for Social Studies in upper basic schools.

Hypothesis 3: *There is no significant difference between the experienced and less experienced Social Studies teachers' use of Computer Assisted Instructional Materials (CAIM) in upper basic schools.*

In order to test null hypothesis one, responses of experienced and less experienced Social Studies teachers on the extent of using CAIM for teaching Social Studies were analysed using t-test statistic. The result was illustrated in table 4.

Table 4: t-test analysis of CIP of experienced and less experienced Social Studies teachers

Variables	NO	Mean	SD	df	t-value	Sig. (2-tailed)	Decision
Experienced teachers	73	12.03	4.02				
				148	0.27	0.79	NS
Less Experienced teachers	77	12.19	3.65				

$P \geq 0.05$

Results in Table 4 showed that the calculated t-value is 0.27, was obtained with p-value, 0.79 at alpha level of 0.05. Since the significance value is greater than 0.05 alpha level (0.79>0.05), therefore, null hypothesis 3 is hereby accepted. This implies that there is no statistically significant difference between experienced and less experienced Social Studies teachers on the use of Computer Assisted Instructional Materials for Social Studies in upper basic schools.

Discussion of Findings

This study on the teacher' variables and use of Computer Assisted Instructional Materials (CAIM) in upper basic Social Studies has provided some findings. Findings of this study revealed that majority of Social Studies teachers do not use Computer Assisted Instructional Materials (CAIM) in teaching Social Studies they only use it for storage and processing of information. This finding corroborates Adekeye (2008) who discovered that audio-visual instructional materials such as television, video, computer and internet are not so available despite the fact that these resources are very important for the successful teaching and learning of Social Studies. This

finding also in line with that of Ukpebor and Emwanta (2012) who established that computers and internet are not adequately available and use in schools. Many schools may boast of computer laboratory but only a few can pride themselves on the internet access. However, most of the schools who could boast of computers in their schools only had out-dated computers from which a few were functioning.

Finding of this study also revealed that teachers' gender is not a significant variable in the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools. 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.

Finding of this study also revealed that teachers' qualification is not a significant variable in the use of Computer Assisted Instructional Materials (CAIM) in upper basic schools. This finding disagreed with Umar (2010) whose findings also showed that a significant difference exists between qualified and unqualified teachers of Islamic Studies in the use of instructional media and Okonkwo, (2002) who found out that in terms of teachers' qualification, teachers with degree made a better used of instructional media thereby produced the highest scoring while the NCE holders followed.

In this study, the finding also showed that teaching experience is not a significant variable ($t=0.27$, $p>0.05$) in the use of Computer Assisted Instructional Materials (CIP) in upper basic schools for the teaching of Social Studies. This finding corroborates Yusuf (2007) who discovered that there is no significant difference between the experienced and less experienced Social Studies teachers in their use of community resources while it disagreed with that of Adekeye (2008) who established that experienced Social Studies teachers use instructional media like instructional materials more than their less experienced counterparts.

Conclusion

This study investigated the use of Computer Assisted Instructional Materials (CAIM) for teaching Social Studies in upper basic schools. CAIM are recommended for teaching upper basic Social Studies curriculum to facilitate and enhance the learners' experience about the subject. However, it as found out in the study that CAIM are not frequently used by Social Studies teachers for instructional purpose in upper basic schools. Only computer systems are occasionally used for information processing and storage purposes. Gender, teaching qualifications and experience are not statistically significant variables that have influence on the use of CAIM for teaching Social Studies in upper basic schools.

Recommendations

Based on the findings of this study, the following recommendations were made.

i. All upper basic school teachers should be encouraged to be computer literate and use CAIM for teaching.
ii. Regular workshops, seminars, and in-service training should be organized for teachers to enable them acquire the necessary skills and update their knowledge on the importance and proper use of instructional software in teaching of Social Studies.
iii. Curriculum developers and other policy makers should include Internet, information retrieval skills in the school syllabus/curriculum for teachers to facilitate teaching and learning of Social Studies.
iv. Capacity building on the use of CAIM should be mounted for teachers.

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STUDENTS' PERCEPTIONS OF COMPUTER-BASED TEST IN NIGERIAN UNIVERSITIES

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Abstract

Some Nigerian universities have adopted computer-based test (CBT) for their courses/examinations and means of testing students. The perceptions of students on CBT in Nigerian universities have not been established and very few studies have focused on determining students' perceptions of CBT. Thus, there was a need for this study to investigate students' perceptions of CBT. The objective of this study was to investigate students' perceptions of the usefulness; ease of use and credibility of CBT in Nigerian universities. The study adopted survey method of descriptive research. Sample was drawn from students from four Nigerian universities: Covenant University; Kogi State University; University of Ibadan; and University of Ilorin. A total of 1506 students' represent the sample for the study. Data was analysed using percentage and mean to answer the research questions. The study revealed that students also had positive rating on perceived usefulness (64.3%), ease of use (66.1%), and credibility (67%) of CBT. The study concluded that students perceived CBT as useful, easy to use and credible. The implication is that the perception of the usefulness, ease of use and credibility of CBT will lead to increase in use of CBT in Nigerian universities. It was recommended among others that Nigerian universities should improve the efficiency of computer-based test to increase its credibility.

Key words: *Computer-based test, Credibility, ease of use, Students' perception*

Introduction

Test is an instrument used to make judgments and assessment of teaching and learning. It is also used as a screening instrument in some organizations. In schools, test is used to measure what learners have learnt at the end of a unit. It is used to promote students, to ensure they have met the required standards on their way towards being certified for completing school or programme of study, to enter certain occupations, or as a method for selecting students for entry into tertiary institutions. Test has to do with merit and worth of the data as applied to a specific use or context. Teachers and administrators need analysis skills to effectively interpret and make value judgments about tests' results. Tests and testing practices are often based on provision of good quality tests to test takers in a cost-effective manner, with the help of test sponsor, test developer, and test administrator (Barbara, 2002).

Alabi, Issa and Oyekunle (2012) identified the paper-based test with many problems such as: tedious processes as the examination was conducted at various and distant centres simultaneously and marked manually; high risks of accidents during travels by both the staff involved and the prospective students for the paper examination; cost of conduct of the examination on the part of the examination bodies including honorarium for invigilators, coordinators, markers, collators and other allied staff; subjective scoring and plausible manipulation of results; late release of results and missing grades; bank draft method of payment by candidates riddled by fraud, loss of money, stress and trauma. The problems of paper-based test also involved heavy resources in terms of manpower and funding (Abubakar & Adebayo, 2014). Davey (2011)

concluded that a wide variety of options is now available for conducting test out of which technologyis one of the most important.

Zhang, Powers, Wright and Morgan (2003) asserted that technology is useful for constructing responses on screen, allows marking quality to be monitored in real time and potentially eliminating the need to gather examiners together. In recent time, technology offers many new opportunities for innovation in educational assessment through potentially and powerful scoring, reporting and real-time feedback mechanisms. Universities have implemented numerous attempts and efforts to integrate information and communication technologies (ICT) into administration and instruction process by the creation of the management information system (MIS) unit (Mejabi & Raji 2010). It is on this note that universities integrate part of information and technology for the purpose of testing the students. Therefore, computer and internet technologies have been useful for many purposes such as tracking and recording students' information, administration of personnel and accounting, and delivering course contents, announcements and assignments (Bennett, 2009). More so, computer and related technologies provide powerful tools to meet the new challenges of designing and implementing assessments methods that go beyond the conventional practices and facilitate to record a broader repertoire of cognitive skills and knowledge (Olumorin, Fakomogbon, Fasasi, Olawale, Olafare, 2013).

Mathematics is viewed as the basis for science and technology and it is the tool for achieving scientific and technological development. Olusi and Anolu (2010) identify the importance of mathematics in the relationship among mathematics, Science and Technology and concluded that without mathematics, there is no science. Gauss (2010) also reiterates the fact that without modern technology there is no society. Eze (2007) asserts that science evolved with the use of mathematical principles and mathematics is a necessary tool needed by individuals to be able to function effectively in the present technological age especially the use of ICT. Without the knowledge of mathematics there is no way by which students can use ICT or engage in CBT.

Andrew, Pullen and Harper (2009) concluded that some of the advantages of CBT to institutions and learners are time analysis of responses to the question level to better discriminate between candidates; including video in questions for scenarios in authentic assessment; adaptive testing, where the next question to be posed is determined by prior response(s); question banks and randomization of questions and response orders to reduce cheating; automated analysis of results from entire candidate cohorts and immediate feedback can be given. CBT in the conduct of assessment has its disadvantages which are expense in buying a computer; technical issues during examinations; too dependent on computers for test; cuts cost of paper and administration (Pinner, 2011). Also human error can never be completely accounted for when using computers for test.

The use of computer-based tests (CBTs) has increased significantly over the last few years. The most common type of CBT is the linear CBT which is a fixed-length computerized assessment that presents the same number of items to each examinee in a specified order and the score usually depends on the number of items answered correctly. Evidently, linear CBT imitates a Paper-based test that is presented in a digital format and pays little or no attention to the ability of each individual examinee. Also computerized adaptive testing (CAT) is a special type of computer-based test.

Each examinee takes a unique test that is tailored to his/her ability level (Van der Linden & Glas, 2000). The face of examinations in Nigeria is gradually getting a new look due to the introduction of the computer-based test (CBT) system. CBT system has been used by a number of Nigerian universities to conduct their post UTME (Unified Tertiary Matriculation Examination) for prospective students. It all started with the University of Ilorin and Covenant University some years ago.

The use of computer for test administration in university education is to change the state of test administration but the integration has not yet being fully utilized in Nigerian universities. Most past studies on Computer-Based Test in Nigeria universities have considered attitudes toward computer-based test and effectiveness of Computer-Based Test on students' academic performance but did not measure other constructs such as usefulness, ease of use and fairness of the CBT. However, only few researchers had determined User's perceptions of CBT but did not create valuable insights into the students' perceptions of CBT. This study therefore created valuable insights into CBT in relation to usefulness, ease of use and credibility.

Research Questions

The following research questions were answered in the study.

1. How do students perceive the usefulness of computer-based test in Nigerian universities?
2. How do students perceive the ease of use of computer-based test in Nigerian universities?
3. How do students perceive the credibility of computer-based test in Nigerian universities?

Methodology

The study adopted the descriptive approach of the survey type. The population for this study consisted of students in the Universities that are involved in the use of Computer-based test in Nigerian Universities. Simple random sampling was used to select sample from the students' population. This is because the study focused on students involved in computer-based test in selected Nigerian universities. The general sample size was determined from the total number of students who were users of computer-based test in the selected Nigerian universities during the 2012/2013. Samples were selected only from the two geo-political zones. University of Ilorin and Kogi State University were selected from the North Central; while University of Ibadan and Covenant University were selected from the South West. The total population of the students making use of computer-based test is 61,048. A total of 1,506 respondents are sampled. For the breakdown of the students' sample selection, see table 1.

Table 1: Students Sample Selection

Universities	Total number of students	Sample
University of Ilorin	24,122	390
University of Ibadan	13,408	378
Kogi State, University	15,947	385
Convenant University	7,571	353
Total	61,048	1,506

The reliability of the questionnaire used in this study was achieved by administering the questionnaire on students of Federal University of Technology, Minna. Cronbach Alpha was adopted to determine the reliability of the instrument. The reliability co-efficient of 0.88 was obtained. The results of the administered researcher-designed questionnaire was subjected to inferential and descriptive statistics andwas coded and analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 for windows. The statistical tests used were the descriptive analysis involving the percentage and mean to answer the research questions 1 to 3.

Discussion

Research Question 1: How do students perceived the usefulness of Computer-Based Test in Nigerian Universities?

The result in table 2 show that computer-based test have been useful to students in Nigerian Universities. The average mean score of students' perceived usefulness of CBT was 39.11 out of a maximum mean of 60, which translated to 65.2%. With this result, it is established that students' perceived usefulness of CBT is positive. The result of this study revealed that students perceived computer-based test as being useful. This is consistent with Zakrewski (1996) who reported that computer-based test is useful for assessment as it saves time of the students and covers a large group of the students at a time. Aojula, Barber, Cullen and Andrews (2006) also reported that CBT is useful for students as it increases their computer knowledge. Similarly, Alderson (2000) reported that students perceived CBT to be useful for assessment. However, the report by Lynch and Whitley (2000), Cotugna and Vickery (2001) contradicts the outcome of this study. The researchers reported in their studies that CBT is not useful for students as felt threatened. This is reinforced by other studies who also reported (Bocij and Greasley 1999; Gilmer and Murley, 2003) that students perceived CBT not to be useful.

Table 2: How Students' Perceived Usefulness of Computer-Based Test in Nigerian Universities

Perceived Usefulness of Computer-Based Test	Mean
1. CBT improves my academic performance.	2.69
2. I find CBT useful for my examinations.	2.58
3. CBT has given me greater awareness of its use.	2.87
4. CBT gives me more confidence using computer for examination.	2.39
5. I am not confident to take CBT.	2.40
6. There are usually no distractions that constitute a nuisance when using CBT for examination.	2.69
7. The speed of using CBT for examination is satisfactory	2.89
8. CBT gives me greater control over my academics.	2.57
9. CBT enhances my effectiveness in academics.	2.64
10. My use of CBT is not voluntary.	2.44
11. Although it might be helpful, using CBT is not compulsory for my course.	2.87
12. Using the CBT enables me to accomplish shopping more quickly than using paper based test.	2.75
13. CBT makes examination easier for me.	2.53
14. I am not comfortable to take CBT.	2.08

Research Question 2: How do students perceive the ease of use of Computer-Based Test in Nigerian Universities?

These results in table 3 suggest generally that students' perceived ease of use of computer-based test in Nigerian Universities were positive and that CBT can be better made compatible with other means of administering test. The results showed that computer-based test have been easy to use by students in Nigerian Universities. The average mean score of students' perceived ease of use of CBT was 44.93 out of a maximum mean of 68, which translated to 66.1%. With this result, it is established that students' perceived ease of use of computer-based test was high. The result of this study revealed that students perceived computer-based test as being easy to use. Parshall, Spray, Kalohn, and Davey, (2002) reported thatstudents' degree of computer literacy increases the usefulness of computer-based test with greater efficiency and possibility to take the test at any time. Jimoh, Yussuff, Akanmu, Enikuomehin (2013) reported that students found CBT useful as they prefer CBT systems better in writing their exams than the traditional paper and pen testing. This confirms that computer-based test in Nigerian universities is useful for assessment in the university.

Table 3:
Students' Perceived Ease of Use of Computer-Based Test in Nigerian Universities (N=1506)

Perceived Ease of Use of Computer-Based Test	Mean
1. CBT is easy to use.	2.75
2. CBT is user friendly.	2.69
3. Compared to paper- based test, CBT is easy for testing.	2.81
4. I find it easy to use CBT for test.	3.10
5. I believe that CBT questions are too cumbersome for me.	2.52
6. My using CBT require a lot of mental effort.	2.18
7. Using CBT is often frustrating.	2.66
8. CBT IS easy to use for my course of study.	2.51
9. It is very conducive to be examined with CBT.	2.56
10. CBT for my course did not work the way that it was supposed to work.	2.52
11. My interaction with CBT has been clear.	2.80
12. I rarely become confused when I use CBT.	2.84
13. I rarely make errors when using CBT.	2.67
14. CBT is not compatible with other test method I use.	2.78

15 Technical problems like power outage, server problem with CBT are controllable.	2.36
16. My interaction with CBT has been understandable.	2.75
17. My interaction with CBT has been lucrative.	2.43

Research Question 3: How do students' perceived the credibility of Computer-Based Test in Nigerian Universities?

The result in table 4 revealed that computer-based test is credible for students in Nigerian universities. The average mean score of how students' perceived credibility of CBT was 42.85 out of a total mean of 64, which translated to 67%. With this result, it was established that students' perceived credibility of computer-based test is positive. The result reveals that students' perceived computer-based test to be credible. The finding agreed with Brown, Race and Bull (1999) who reported that the use of computer-based test is easy as the technical problems like power outage, server problem with CBT are controllable and the questions are not too cumbersome. This factors adds to its credibility. This finding is in consonance with other studies including Fluck, Pullen and Harper (2009) who revealed that CBT is easy to use for students as the features of computer-based test makes it go beyond the conventional practices and facilities, to record a broader repertoire of cognitive skills and knowledge which shows its effectiveness. However the report by Frankola (2000), Bridgeman and Cline (2000) contradict the report of this study as the researchers reported that despite the increase in the use of CBT, students do not find it easy to use.

Table 4:
Students' Perceived Credibility of Computer-Based Test in Nigerian Universities (N=1506)

Perceived Credibility of Computer-Based Test (CBT)	Mean
1. CBT gives the opportunity for reusing questions.	2.56
2. CBT allows guessing.	2.63
3. Compared to paper-based test, CBT does not allow for test Plagiarism.	2.72
4. CBT reduces cheating.	2.87
5. CBT helps to identify questions which are either too 'difficult' or too 'easy'.	2.55
6. CBT helps to eliminate questions which are either too 'difficult' or too 'easy'.	2.28
7. CBT gives room for restarting questions when a problem occurs.	2.75
8. Repeated questions in CBT are not unfair.	2.40
9. CBT test items are randomized to prevent students working at adjacent computers from cheating.	2.73
10. CBT prevents planned sequencing of items.	2.68
11. CBT ensures good justification for my course.	2.68
12. CBT allows assessment of the appropriateness of the examination content.	2.93

13. CBT allows to be more closely monitored by academic staff.	2.58
14. CBT allows feedback during, or immediately after, a test.	2.90
15. CBT time limits for test are unfair.	2.45
16. CBT environments are conducive for examination.	2.87

Conclusion and Implication of the Study

The study concluded that students perceived CBT to be usefulness, easy to use and credible for their assessment. Based on the conclusion, the study implies that CBT will not only reduce examination malpractices in Nigerian Universities but would ensure prompt and timely release of students' examination results irrespective of the population. It will also prepare students in the aspect of speed and accuracy. The study recommended that Nigerian universities should improve the efficiency of computer-based test to increase its credibility in testing students. Since students perceived CBT as being useful they should be further encouraged and if possible mandated in all Nigerian universities.

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EFFECTS OF COMPUTER ASSISTED INSTRUCTIONAL PACKAGES ON THE PERFORMANCE OF SENIOR SECONDARY SCHOOL VISUAL ART STUDENTS

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Abstract

The application of technological tools such as computers in education has significantly been enhancing teaching of Visual Arts which people believe are not lucrative and are lazy man's work. This study examined the effects of Ceramics computer assisted instructional package (CCAIP) on Senior Secondary School Students' performance in Visual Art (ceramics) in Ogbomoso, Nigeria. Samples comprised 50 students from two purposively selected secondary schools in Ogbomosho Nigeria. The research instruments were structured questionnaire Visual Art Performance Test (VIAPET) and developed Ceramic Computer Assisted Instructional Package (CCAIP) developed using the five stages of ADDIE model. The experimental group was exposed to CCAIP, while the control group was exposed to VIAPET Three research questions were raised and answered and three corresponding hypotheses were generated and tested, hypothesis one and two were tested with t-test while hypothesis three was tested using Analysis of covariance (ANCOVA). Results indicated that t (48) = 2.68 with p = 0.91, t (48) = 5.96 with p = 0.63 and F (1, 47) = 5.432 with p = 0.823, which implied that no significant difference occurred between the performance of students taught with CCAIP and those taught with VIAPET. Even though no significance difference existed, the study however recommends that CCAIP should be developed for teaching difficult Arts concept since it can create much excitement in students.

Key words: *Visual art, Ceramic Computer assisted instructional package, Gender*

Introduction

Visual Art is an access into a world of sensation and experience with an opportunity to explore using various media to produce things for aesthetics and educational purposes. .Uzoagba (2000) expressed art as the power of doing something which is taught by nature and instinct. It is the expression of man's abilities, skills and aptitude in various ways. Art encourages rapport between the children and bring them in close contact with culture and that of distant places (Elufadeju, 2012). Art can be either visual or Non-visual. Visual Art include visible products like painting, graphics, photography, textile, sculpture and ceramics, while non-Visual Art refers to products cannot be seen with ordinary eyes, they are purposely for entertainment and recreations. Education is a means of empowering learners, using various skills and resources to complement teaching. Learner centred method of education considers and makes use of all that is required to ensure that learning takes place. Information and Communication Technology (ICT) encompasses use of technological tools like video, computer, slide synchronise with audio and the internet as innovative tools to simplify and enrich learning Use of Computer package is a technology that provides innovative tools to solve learners' problems which eventually makes the subject interesting to learners.

Chief examiner's report (2010) indicated that many students avoid studying Visual Art because of its complexity and lack of adequate instructional materials to complement teacher's effort leading to poor academic performance. Some parents also discourage their wards from offering Visual Arts erroneously labelling that they are lazy man's work.

Also Soetan, Aboyeji & Alasan (2013) opined that teachers preferred to teach other aspects because ceramics is dirty, tasking and the process is demanding. Hence the use of CCAIP to teach ceramics will make it adaptable to improved skills of producing ceramics wares. Computer is an ICT tool that appeal to learners senses in order improve students' learning styles and preference more effectively than the conventional approach of teaching and learning. CCAIP removes the complexity of teaching and makes the learning of Visual Art (ceramics) more fascinating and exciting which can sufficiently guide students to watch and produce ceramic wares that could be physically seen. This study examined the effect of computer assisted instructional package on the performance of Senior Secondary School Visual Art students.

1. Ascertained the difference between the pre and post-test scores of students in the control group and those in the experimental group.
2. Examined the difference between the performance of students taught Ceramics with CCAIP and those exposed to VIAPET,
3. Investigated gender influence on the performance of students exposed to CCAIP and those exposed to VIAPET.

The following questions were raised to guide the study

1. Is there any difference between the performance of students in the pre and post test scores of students in the control group and those in the experimental group?
2. is any difference in the performance of students taught Ceramics with CCAIP and those exposed to VIAPET,
3. Does the students' gender have any influence on the performance of students exposed to CCAIP and VIAPET?

H_{01}: There is no significant difference between the pre-test scores of students of control group and experimental group.

H_{02}: There is no significant difference the performance of students taught Ceramics using Computer Assisted Instructional Package and Conventional method.

H_{03}: There is no significant difference in the performance of students taught Ceramics using computer assisted instructional package and those taught with conventional teaching method based on gender.

Review of Related Literature

Educational technology recognizes diverse learners' needs, hence the use of resources to solve learners' problems. Soetan (2009) opined that Fine artists and Educational Technologists possess skills and expertise in designing and producing useful and valuable instructional materials to enhance teaching, proper integrations of ICT tools like videos projectors and computer will foster learning at all levels of education. In support of use of ICT, FRN (2009) submitted that government shall provide adequate infrastructural and develop capacity for effective utilization of information (ICT) to enhance the delivery of Basic education in Nigeria. It infers that use of various strategies and tools could employed to improve students' academic performance. Kalilu (2013) opined that technology is a collection of technique, a current state of knowledge on how to combine resources to solve problems, which include technical methods, skills, processes, tools or raw materials.

Visual Art on productivity and economic development made it vital part of national development strategies in many nations which enables production of skilled individual who can think rightly and work with their hands using available materials, ICT is any equipment that is used for the automatic acquisition, storage, manipulation, management, control, display, switching and transmission of information. (FRN, 2007) Visual Art, a major subject taught in Nigeria Senior Secondary Schools to uphold the culture of the nation should be made compulsory for its creative nature to turn Nigerian fortune around its evolution of technology that will meet International standards on the one hand, and on the other hand vocationalise its economy in order to transform it from its current consumer nature. (Kalilu 2013) It is a means of expression, cultural preservation, beautification, and a means of livelihood where by students could be self-reliant at completion of secondary school education. Unegbu (2014) corroborated that Visual Arts are aesthetic, and aesthetic brings about happiness and happiness prolongs life which means that there is Life in Art. Visual art has lots of opportunities for people that offer it

The computer is used tremendously in Senior Secondary Visual Art classes: for drawings, graphics, creation of patterns scan motifs, images and photographs. It is also used for mixing, separating and applying colours. Art work can also be exhibited, viewed, appreciated and purchased on the Internet where by individuals can order for such works. Alhayek (2004) submitted that computer technology has been significantly used in educational process at all levels; it has become an integral part of academic disciplines, which improved teaching and learning processes positively.

However, Mills (2001) supported that CCAIP was found to be an effective tool in genuine classroom learning which entails the use of the computer as a means of successful lesson delivery, when teacher might not be present. Christensen and Knezek, (2001) posited that the use of computers have positively effected students' performance compared to traditional strategy. Some of the benefits of using CCAIP include emphasis on active learning, enrichment of collaborative learning, encouragement of greater students' independence and task-based teaching (Spinelli, 2001). Use of CCAIP encourages discovery, strategies where students are actively involved in the process of practical assignment where students can produce their wares having watched the programme which could be submitted physically

Methodology

This study was a quasi-experimental type of the pre-test, post-test, non- randornized, control group design. It is a 2x2 factorial design. The target population of this research was the first year Senior Secondary Visual Art students in Ogbomoso town, Nigeria. The students were selected from two purposively sampled secondary schools that have computer facilities. Fifty (50) students were randomly sampled: 16 boys and 7 girls for the experimental group and 19 boys, 8 girls for the control group.

The research instruments CCAIPandVIAPET which covers adapted ceramic aspect of Nigeria senior secondary school visual art curriculum from material for clay modelling, preparation and modelling technics. The instrument was package by professional programme developer and evaluated by one Computer Analyst and two Fine Art teachers for suitability to teach.

The VIAPET contained 30 multiple-choice objective tests with five options each, adopted from validated West African Senior Secondary School Examination Visual Art question papers. The VIAPET was used as pre-test and post-test. The experimental group was exposed to CCAIP with multimedia projector while control group was taught using conventional strategy by one of the researchers. ANCOVA was used to calculate the students' pre-test and post-test scores using SPSS (version 20.0).

Results

Analysis of data collected through the administration of the CCAIP and VIAPET

The t-test score reflecting the differences in the control and experimental group is presented in table 1

Table 2

t-test on difference between the pre-test scores of students of control group and experimental group.

Groups	N	X	df	t	Sig (2-tailed)	Decision
Control	23	26.56				
			48	2.68	0.91	Not Rejected
Experimental	37	26.39				
Total	50					

As indicated in Table 1, the result t (48) = 2.68, p > 0.05 which implies that the null hypothesis was not rejected because the significant value of 0.91 is greater than 0.05. This means that averagely, pre-test scores of students within the control group did not differ with students in experimental group.

Similarly, the test score indicating the difference between the performance of students thought ceramics with CCAIP and conventional strategies

Table 3:

t-test on difference the performance of students taught Ceramics in Visual Art.

Groups	N	X	df	T	Sig (2-tailed)	Decision
Control	23	42.23				
			48	5.96	0.63	Not Rejected
Experimental	37	42.79				
Total	50					

Table 2 revealed that t (48) = 5.96, p > 0.05 since the significant value of 0.63 is greater than 0.05, the null hypothesis was thus not rejected. This implies that there is no significant difference the performance of students taught CCAIP and conventional strategies.

In order to ascertain whether there is no significant difference in the performance of students ANCOVA was used to test the hypothesis

Table 3:
Analysis of Covariance (ANCOVA) on the Post-test and Post-test Performance of male and female Students taught Ceramics.

Source	Type III sum of Square	df	Means square	F	Sig	Remarks
Corrected Model	2.614	2	1.206	0.078	0.254	
Intercept	1362.049	1	468.230	165.237	0.000	
Gender	11.244	1	5.432	21.131	0.823	Not Rejected
Pre -test	466.053	1	167.186	17.233	0.523	
Error	154.431	47	18.236			
Total	2145.123	50				
Corrected total	258.066	49				

Table 3 revealed that no significant difference in the performance of students taught Ceramics based on gender with F (1, 47) = 21.131, P> 0.05. With the p value of 0.823 which is greater than 0.05, hence the null hypothesis was not rejected. This implies that the performance of male students taught ceramics did not differ from their female counterparts. Therefore, there is no significant difference in the performance of students taught Ceramics based on gender.

Discussion

Though no significant difference occur between the groups exposed to CCAIP and conventional strategies and no significant difference occur in the performance of students based on gender. It implies that the two treatments improve learners' performance. This is an agreement with Christensen and Knezek, (2001) and Soetan, Aboyeji& Alasan, (2013). that usage of multi-media motivates learners and has positive effect on their performance. The findings established that use of CCAIP was good and promoted effective instructional delivery in secondary schools.

Educational Technologists should beencouraged to produce relevant media to teach difficult concepts in other school subjects.Instructional packages must be subjected to evaluation by Educational Technologist before it is administered to the students.Parents should encourage their wards that have artistic skills to embrace use of computer to support their learning. Government should provide ICT facilities like computers to enhance teaching all subjects in schools for students to be fascinated towards ceramics for them to be self-reliant instead of looking for white collar jobs.

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INFLUENCE OF SOCIAL MEDIA ON CLOTHING SELECTION AMONG FEMALE UNDERGRADUATES IN UNIVERSITY OF ILORIN, ILORIN, NIGERIA

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Abstract
The study investigated the influence of Social Media on clothing selection among female undergraduates in University of Ilorin, Ilorin. Two research questions were raised. Related Literatures were reviewed. The study adopted descriptive survey design which was employed to obtain responses from a sample size of 140 female undergraduates using random sampling technique from total population of 2800. Structured Questionnaire was used to solicit information from the respondents. Findings showed: Facebook, Instagram, Pinterest, YouTube, Myspace, Twitter, Google+ as types of social media used for female undergraduates clothing selection. Also, the respondents used social media to check for fashion in vogue, purchasing of quality and designer clothes, checking for clothing styles, prices of clothes are also compared through social media. Conclusively social media clothing selection does not end until the articles are worn. Among recommendations made is that social media should create more platform for awareness on clothing styles and fashion trends.

Keywords: *Influence, Social media, Clothing, Selection and Consumer.*

Introduction

Clothing selection is often determined by how a consumer perceives his or her self-concept and the desire to express it. Clothing selection can refer to either selecting clothing to buy (as in a store) or selecting clothing to wear (as from a wardrobe). Clothing selection is linked to the meaning of clothing, as an individual's mood or sociability can have an impact on the clothing one decides to purchase and wear based on the meanings with particular clothing items (Cosbey, 2001).According to Anyakoha (2015) and Uzoka (2000), clothing selection involves deciding what to wear, how to purchase or obtain what to wear including methods of sewing garment and when to wear them for various occasions. Clothing selection does not end until the articles worn on the body. Clothing selection practices of any given individual includes all the procedures involved in planning, shooing and wearing of clothes. Each of these procedures include various steps of making decisions.

Adebisi (2015) and Arubayi (2009) explained that female undergraduates and other young adults have long recognized the significance of clothing selection, these are inform of signal, connectedness and in differentiation. Group of young people adopt styles of apparel that expresses particular instinct to reasons of using social media. Among them are: checking fashion in vogue, selection of colours, online shopping, comparisons of prices and latest artist appeal. Anyakoha (2015), Adebisi (2006) and Uzokwa (2005).Parson (2011), Margold and Faulds (2009) and Gross (2000) asserted that in the past decades, social media has defined the world live in. what began as a means to communicate, maintain contact, or reconnect with old friends, has slowly but surely evolved into a crucial part of our daily lives; severely altering the way business is done. One specific area of business that has been particularly affected by the way business is done. One specific area of business that has been particularly affected by the social media revolution is the fashion industry. Through the institution of social media, what was once only available to elite insiders is now accessible by the masses. For example, because of a designer's Facebook, Google+, Pinterest, YouTube, Myspace, LinkedIn, Instagram account, those previously unconnected to fashion can now watch

live footage from Mercedes-Benz fashion week taking place in the New York, an opportunity that was once limited to industry insiders, celebrities and socialites. Before the existence of these social media outlets, sales, store traffic, and financial records were conceivably the only way to gauge consumers' opinions. The way to communicate clothing selection that will be more cost effective and time efficient is through social media. In order to remain a market fixture, bricks and mortar retailers must adapts and begin utilizing social media as a cornerstone in their business structure.

According to Berger and Mikmen (2012) they asserted that emergence of Social Media (Facebook, Twitter, etc.) has boosted interest in word of mouth and viral marketing among luxury brands. Word of mouth (WOM) interpersonal communication about product and services between consumers is one of the most influential source of marketplace information. Furthermore, Kozinet (2016) asserted that fashion is everywhere, through blogs some female undergraduates show their interest and possess unlimited space for their self-expression.

Expeditious popularity of social media usage is now one of the important online marketing tools. Social media has shifted the existing communication pattern and influencing the communication process amongst the individuals. Marketers are paying attention towards this emerging media to attract their customers because this media is providing a new landscape for marketers (Kim and Ko 2012). They opined further that as a marketing tool, social media has altered from old media in many ways like easy usability, quick response, easy and rapid accessibility, accessibility, immediacy and eminence. Malgold *et al* (2009) and Parson (2011) defined Social Media as brings all together as it is an interactive stage. Consumers share their view with comments, likes, shares, blogs, discussions and some others ways. Its providing new expensive and a quick to communicate than traditional media. With the advent of information and modern communications technology, consumers are able to shop via internet using several social media and just by sitting at home, saving the stress of going out to.shopping. It is on this basis that the study investigated influence of social media on clothing selection among selected female undergraduates in University of Ilorin.

Research Questions

The following questions were raised:

1. What are the types of social media the respondents used in clothing selection?
2. What are the uses of social media in clothing selection of the respondents?

Methods

The study adopted a descriptive research design where data were collected from female students using questionnaire. A survey study is one in which data are collected from a relatively large number of people or items considered to be representative of the entire group.The population of the study consist of female undergraduate students departments in University of Ilorin, Ilorin, Kwara State, Nigeria namely; Home Economics, Accounting, History, and International Studies and Statistics of 2015/2016 academic session from hundred level (100) to four hundred levels the target population was 2800.

Table 1: Population of the respondents

S/N	Department	No. of Students	Sample No. of Students
1	Home Economics	184	35
2.	Accounting	969	35
3.	History and International Studies	874	35
4.	Statistics	773	35
	Total	**2800**	**140**

Random sampling technique was used to select the participating respondents. It selected a total of 140 female undergraduates from the four departments using 5% of their total population. These include Home Economics (35), Accounting (35), History and International Studies (35) and Statistics (35).

Structured questionnaire was used for the study. It was administered to 140 female undergraduates from four departments. The questionnaire was made up of two sections. Sections A was on types of Social Media use for clothing selection and Section B: the uses of clothing selection. A five point Likert Scale was used to access the responses: Strongly Agree (5), Agree (4), Strongly Disagree (3), Disagree (2), Undecided (1).

The Questionnaire was validated by the respondents and two experts in the department of Home Economics and Food Science, University of Ilorin to ascertain if the questionnaire measure what it is intended to measure.

The Cronbach Alpha statistical methods was selected within the Statistical Package for Social Sciences (SPSS) for testing reliability coefficient to determine the internal consistency of the respondents to the items on the questionnaire used for the study. The reliability coefficient obtained was 0.87. This is in line with the proposition of Gay and Airasian (2003) that a coefficient of 0.70 and above is acceptable for a survey research. By this coefficient, the instrument is reliable. The data was collected on the spot of distribution to avoid misplacement of questionnaire by respondents. The data collected from respondents was analysed using simple statistics such as Frequency Counts Percentages, Means and Standard Deviation, while Chi-Square was used to test the null hypothesis at 0.05 level of significance.

Results

Research Question 1: What are the types of social media the respondents used for clothing selection in the study area?

Table 2: Types of Social Media the respondents used for the clothing selection

S/N	Items	O	S	R	N	$\bar{X}$	Remark
1.	Facebook	56	48	24	24	3.48	Often
2.	Instagram	56	40	18	26	3.58	Often
3.	Pinterest	11	28	31	70	3.57	Often
4.	YouTube	14	38	28	60	3.53	Often
5.	Myspace	8	18	37	77	3.30	Often
6.	Twitter	16	36	28	60	3.28	Often
7.	Google+	28	16	38	58	3.50	Often
8.	LinkedIn	12	25	25	78	3.20	Often
	Grand Mean					**3.43**	**Often**

Key: O= Often, S= =Sometimes, R = Rarely, N = Never, X = Mean

Table 2 indicated the mean of the types of Social Media the respondents used for their clothing selection. A cut off mark 2.50 was used for the decision, such that a mean rating of an item by the respondents equal to or above 2.50 was taken as often while less than 2.50 was taken as never. The data showed that the respondents often use Facebook, Instagram, YouTube, Myspace, Twitter, Google+, LinkedIn as their means of clothing selection.

Research Question 2: What are the uses of Social Media in clothing selection of the respondents?

Table 2: Uses of Social Media in clothing selection by the respondents.

S/N	Items	SA	A	SD	D	UD	X	Remarks
1.	Social Media is used for checking the fashion in vogue	66	54	12	6	2	1.74	Disagree
2.	Social Media is visited for selection colours of cloth	32	64	22	14	8	3.70	Agree
3.	Social Media is used by female undergraduates students to check for clothing styles	62	60	12	4	2	4.26	Agree
4.	Sexually attractive clothes are selected through Social Media	55	59	8	12	6	4.04	Agree
5.	Social Media is used is used for online shopping of clothes	48	64	12	14	2	4.01	Agree
6.	Social Media is used for purchasing clothes that are not of good brand	12	34	24	55	15	2.81	Disagree
7.	Prices of clothes can be compared on Social Media	42	82	12	2	2	4.14	Agree
8.	Latest artist apparel is checked for through Social Media	79	49	8	4	-	4.45	Agree
9	Fashion Industries make use of Social Media in advertising their products	89	47	2	2	-	4.59	Agree
	Grand Mean						**3.75**	**Agree**

KEY: SA = Strongly Agree, A = Agree, SD = Strongly Disagree, D = Disagree, UD = Undecided

Table 2 shows the Social Media in clothing selection by the respondents. The mean of 3.00 was used for the decision, such that a mean rating of an item by the respondents equal to or above 3.00 was taken as agree less than 3.00 was taken as disagree. It shows that the respondents agree to seven items with mean above 3.00 and disagree to two items with mean below 3.00.

Discussion

Data on table 1 revealed that majority of the respondents used different types of social media for their clothing selection. This is supported by Kim and Ko (2012) that asserted that social media inform of Facebook, Twitter, Google+, YouTube etc. have altered old media in many ways that brings easy usability, quick response, easy and rapid accessibility, immediacy and eminence. Buttressed with the opinion that

consumers are able to shop via internet using several social media and just by sitting at home saving the stress of going out to shopping mall.

Table 2 indicated that the uses of social media in clothing selection by the respondents. Adebisi (2016) and Anyakoha and Uzokwa (2005) opined that checking of fashion in vogue, selection of colours, online shopping, comparism of prices are some of the reasons of using social media in clothing selection. In addition, undergraduates and other young adults have long recognized the significance of clothing selection (Adebisi (2015) and Arubayi (2009)).

Conclusion

Social Media is very important to communicate information to audience. Clothing selection does not end until the articles are worn. The practices of an individual includes all the procedures involved in planning, shopping and wearing of clothing. Through the institution of social media, what was once only available to elites is now accessible to the masses.

Recommendations

Based on the findings of this research, the following recommendations were made:

1. Social Media should create platform for awareness on clothing styles and fashion trends
2. Fashion industries using Social Media platform as a marketing tool should reduce the use of sexually provocative clothes for advertisement
3. Female undergraduate students should check the different uses of social media for their clothing selection and avoid selection of clothes that are sexually attractive
4. Social Media should help in confronting indecent dressing rather than support it.

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TEACHERS' ATTITUDES TOWARDS THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY FOR TEACHING MATHEMATICS IN BASIC SCHOOLS IN ILORIN

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Abstract

Teaching and learning in the 21st century has undergone a rapid paradigm shift as there have been a great clamoring for the implementation of Information Communication Technology (ICT) gadgets into the teaching and learning process. This study investigated teachers' attitude toward ICT utilization for teaching mathematics. Survey research design was adopted. The Sample consisted 225 mathematics teachers purposively selected. 36-item questionnaire was utilized in collecting data while percentage, mean and standard deviation were used to analyze the data collected. The results of the study indicated that mathematics teachers have positive attitude towards the use of ICT for teaching, p = 0.332 is less than 0.05 alpha level no significant difference in the attitude of mathematics teachers to ICT use based on their gender and qualifications. (Add Values) Recommendations were however made that ICT should be adopted as a medium for reinforcing students learning of different concepts; also stable electricity should be provided for schools' use of tools.

Keywords: *Teachers, Attitude, ICT, Mathematics, Basic Schools*

Introduction

The educational system has been under tense pressure to integrate innovative strategies which will move it to the next page. One of them is integrating information and communication technologies (ICT) in the teaching and learning process. This is to equip students with the knowledge and skills they need in the 21st century. Teaching profession is evolving from an emphasis on teacher centered learning to an interactive learning environment. Therefore, the challenges of the education system in the 21st century will not be complete if ICT is not incorporated in the system (Nwoke & Akukwe, 2012).

Generally, educational technology relies heavily on the growth of its products from local and foreign supplies. ICT have the potential to "bridge the knowledge gap in terms of improving quality of education, increasing the quantity of quality educational opportunities, making knowledge building possible through borderless and boundless accessibility to resources and people, and reaching populations in remote area to satisfy their basic right to education (Asian Development Bank, 2009).

ICT and teacher education in Nigeria have become crucial in the drive to make teachers relevant in the digital era. Technology can empower teachers and enhance learning in an efficient and sustainable manner, through educational software and videos that are available to teachers and school administrators. The use of ICT is changing teaching in several ways, such that teachers are able to create their own materials and they have more control over the materials used in the classroom than they have had in the past (Umoetteh, 2007). Okigbo and Osuafor (2008) stated that mathematics is the pillar of science while technology and its functional roles in the development of science and technology is multi-dimensional such

that all areas of science, technology and business require its application. Amuche & Kukwi (2013) opined that Mathematics is the culture which gives man the opportunity to know and access things and objects within his immediate and general environment.

However, the use of ICT can be employed to change the perspective of both students and teachers towards learning and teaching mathematics. This is because some ICT materials give students the opportunity to learn at their own pace and offer them immediate feedback on their academic performance (Nwoke & Akukwe, 2012). Teachers need resources that can assist them to carry out their duties effectively. Teaching methods over the years have revealed that there have been changes from one position to another; efforts have been made by the teachers to improve the teaching of mathematics through the use of communication technologies. Attitude refers to positive or negative judgment about a concrete subject. Attitude is determined by the analysis of information regarding the result of an action and by the positive and negative evaluation of that result (Ajzen & Fishbeing, 1980). There is a common saying that attitude determines altitude. Studies have established close links and affinities between teachers' attitudes and their use of ICT. More positive attitudes towards the computer were associated with a higher level of computer experience (Dyek & Smither, 1995, Teo, 2008).

Attitude has been defined as a learned predisposition to respond positively or negatively to a specific object, situation, institution, or person (Ainley, 2011). This implies that attitude affects people in everything they do and in fact reflects what they are, and have a determining factor towards people's behavior. Akinbobola (2015) stated that attitude towards mathematics deals with the belief, interest, perception and aspiration, practicing habits, persistence and self-concept of students in dealing with mathematics. Teachers' attitude is a major predictor of the use of new technologies in instructional settings. Zhao and Cziko (2001) noted that three conditions are necessary for teachers to introduce ICT into their classrooms. Teachers should believe in the; effectiveness of technology, that the use of technology will not cause any disturbance in their teaching and that they have control over technology. The successful use of technology in the classroom depends to a large extent on the teachers' attitude toward these tools, in fact, it has been postulated that Attitude towards computers affect teachers use of computers in the classroom and the likelihood of their benefiting from training (Wuever 1994) cited in Anaza (2011).

Teachers' teaching qualification is one of the Factors that enhance the skills of an experienced teacher. Gbadamosi, Abimbola and Ahmed (2014) stated that teachers with a background in educational qualification had a significantly higher utilization level of the innovative teaching strategies than their counterparts without any background in educational studies in the process of implementing biology curriculum. Teaching experience is known to be an important factor in mathematics teaching and learning situations. Teachers with professional experiences are better in making transition smoother into the teaching than those ones who have just left the secondary school.

Gender refers to the condition of being male or female. That is, boy or girl, man or woman. Human beings generally all over the world are classified into two biological groups. Hence gender is discussed; reference is made to man or woman as a social group (Tunde-Awe, 2003).

Teachers play invaluable roles in the educational development of a country. This development radiates to all aspect of growth and changes needed in the sciences and technologies since teaching is the primary duty of teachers, their attitude towards the use of ICT cannot be overemphasized. This was

learning could not also be underestimated. In order to be able to cope with these functions, there is the need for teachers to cultivate positive attitude towards the use of ICT, which affords them a unique opportunity to bridge the gap between them and their academic counterparts in developed nations. Many students perceive mathematics as a difficult subject and this contribute to one of the reasons many find it difficult to learn the ideas behind the subject. One of the subjects, where the use of ICT is needed in the teaching-learning process is mathematics which is abstract in nature. Teachers are constantly looking for methods or tools to help their students understand the underlying concepts of the lesson. The use of ICT in the teaching of mathematics is to supplement the teacher's verbal presentation of facts in a lesson (Salako, 2006). Despite the popular awareness of the contributions of ICT and its role in various aspects of life, most mathematics teachers at secondary school level are yet to adopt it in the teaching learning of the subject. In view of these, there is the need to also investigate teachers' attitude towards the use of ICT for teaching mathematics. This is the gap the researchers intend to fill.A descriptive research of the survey type was employed for this study. It was targeted to the mathematics teachers' attitude towards the use of ICT in teaching mathematics in upper basic secondary schools in Ilorin metropolis. This method was deemed the most appropriate design for this study because it involves selecting a chosen sample from a large population. The target population for the study comprise of all the mathematics teachers in Ilorin metropolis. However, purposive sampling technique was employed to select the 130 mathematics teachers that participated in the study based on their gender, experience and qualifications.

The questionnaire was validated by five lecturers in Department of Educational Technology and five lecturers in Department Mathematics, University of Ilorin. The experts made necessary corrections. The research instrument was tested for validity and reliability using test-re-test method. The researchers personally administered 225 questionnaires to the respondents and was able collect only 220 that is, 97.7% them from the respondents. The collected data was analyzed using descriptive and inferential statistic. In analyzing the data collected, descriptive statistics was employed using SPSS 20 packages. Simple percentage, mean, standard deviation, and t-test were used to analyze data for the research questions and hypotheses.The study looked at how the mathematics teachers' attitude influenced their gender, experience, and qualification toward the utilization of ICT for teaching.Based on the research questions, the following research hypotheses were tested in this study. In the light of the research questions, the researchers tested whether there will be significant difference in the attitude of mathematics teachers' ICT utilization based on gender, experience and qualification.

Results and Discussion

Table 1:
Mathematics Teachers Attitude towards the Utilization of ICT for Teaching Based on their Gender

Variable	N	X	SD	Df	Cal.t value	P. value	Remark
Male	116	28.129	5.554				
				218	0.972	0.332	Not Rejected
Female	104	27.404	5.496				

Table 1, reveals that there was no significant difference between male and female mathematics teachers' attitude toward the utilization of ICT for teaching. This is because of the result; df (218), t = 0.972, p = 0.332 is less than 0.05 alpha level of significance. The hypothesis which states that there is no significant difference is hereby not rejected.

Table 2:
Mathematics Teachers Attitude towards the Utilization of ICT for Teaching Based on Qualification

	Sum of Squares	Df	Mean Square	F	Sig.	Remark
Between Groups	61.416	3	20.472	0.667	0.573	Not Rejected
Within Groups	6625.543	216	30.674			
Total	6686.959	219				

From Table 2, it was revealed that F (3, 216) = 0.667, P= 0.573 greater than 0.05 alpha level of significance. The response on mathematics teachers' attitude towards the utilization of ICT for teaching based on their qualifications was not significant. Meaning that the hypothesis which stated that; there is no significant difference in mathematics teachers' attitude based towards the utilization of ICT for teaching based on qualifications was not rejected. This also indicates that mathematics teachers' qualification does not influence their attitude towards the utilization of ICT for teaching the subject.

Table 3
Mathematics Teachers' Attitude towards the Utilization of ICT for Teaching Based on their Years of Teaching Experience

	Sum of Squares	Df	Mean Square	F	Sig	Remark
Between Groups	242.176	3	80.725	2.706	0.046	Rejected
Within Groups	6444.783	216	29.837			
Total	6686.959	219				

From Table 3, it was revealed that F (3, 216) = 2.706, P = 0.046 less than 0.05 alpha level of significant. The response on mathematics teachers' attitude towards the utilization of ICT for teaching based on their years of teaching experience was significant. Therefore, the hypothesis which stated that; there is no significant difference in mathematics teachers' attitude towards the utilization of ICT for teaching based on their year of teaching experience was rejected. This also indicated that mathematics teachers' years of teaching experience influence their attitude towards the utilization of ICT.

The study revealed that teachers' attitude towards the use of ICT for teaching mathematics is positive. This is similar to the findings of (Kennewell & Morgan, 2003, Chai, Hong, Huang-Yao, & Teo, 2008), who also found that positive attitude is an important indicator of willingness and first step in effective ICT integration into school curriculum. This study also revealed no significant gender difference in their attitude towards ICT. Findings of Yusuf and Balogun (2011) revealed that majority of the student-teachers

have positive attitude towards the use of ICT and they are competent in the use of few basic ICT tools. And no significant difference was established between male and female student-teachers' attitudes and use of ICT. The findings also indicated how prepared the teachers are in applying ICT for teaching mathematics. The study also implied that the mathematics teachers' attitude towards the use of ICT for teaching mathematics was highly effective.

Also, the study indicated that there was no significant difference in the attitude of the male and female mathematics teachers' towards the use of ICT for teaching the subject. This is similar to the findings of Derbyshire (2003) which revealed that gender equity does not exist in practice. The study showed that there is no significant difference in the attitude of mathematics teachers' based on their qualifications. That is, the mathematics teachers' qualification does not influence their attitude towards the use of ICT for teaching the subject. Mathematics teachers' attitudes toward the use of ICT in teaching mathematics based on their years of teaching experience indicates that there was a significant difference. That is the hypothesis was rejected, which also indicate that the mathematics teachers' years of experience influence their attitudes towards the use of ICT in teaching mathematics.

Conclusion and Implications

The use of ICT is influencing teaching in several ways. With ICT, teachers are able to create their own materials and they have more control over the materials used in the classroom than they have in the past. It seems that technology is requiring teachers to be more creative in customizing their own materials. Also, using Web pages to enhance activity and demonstrates that technology can be used to complement other aspects of good teaching rather than replace them. It is evident that involving students in creation of useful materials as a part of a learning exercise is a way to make school more meaningful for students.

Information and Communication Technology has a lot to offer in teaching mathematics through the application of ICT, it is possible for teachers at the upper basic secondary schools to benefit from collaboration in research as well in development skills. The use of information and communication technology plays significant roles in nation building. The use of ICT has increased productivity in all spheres of human endeavor. Jobs which should have taken human beings years to perform are done within a twinkling of an eye. The world has become a global village because of ICT. Based on the findings and conclusion of this study, the following recommendations if effected could provide solutions to the identified problems. Government at all levels should give necessary supports to procure all the needed ICT facilities. Seminars, conferences and workshops should be organized for teachers on how to integrate ICT for teaching. Non - Governmental organizations should also complement the government by donating ICT facilities to schools.

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BASIC SCIENCE TEACHERS' VIEWS ON THE INTRODUCTION OF THE SCIENCE, TECHNOLOGY AND SOCIETY CURRICULUM AS INNOVATION IN KWARA STATE, NIGERIA

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Abstract

The Introduction of Science, Technology and Society curriculum into science curriculum aims at equipping students to understand and situate scientific and technological development in their cultural, environmental, economic, political and social contexts. Hence, this study was conducted to find out the views of secondary school teachers in Kwara State on the introduction of science Technology and Society (STS) curriculum into the basic Science curriculum of the upper basic level of the Nigeria Education System. The study was a descriptive survey involving (256) Basic Science Teachers Sampled using cluster sampling techniques. The instrument for the study was a researcher designed questionnaire termed Science, Technology and Society Curriculum Questionnaire ***(STSCQ).*** *Data obtained were analyzed using frequency counts, percentages, mean and chi-square statistics. The result of the study revealed that there was no significant difference between the views of experienced and less experienced as well as between the male and female basic science teachers on the relevance, adequacy and implementation of STS curriculum into the secondary school. By implication, experienced and less experienced basic Science teachers had similar views on the relevance, adequacy and implementation of the STS curriculum to the secondary schools level of education. Therefore, the views expressed by the teachers were not influence by their experience. Based on the finding of this study, it was recommended that the STS component of the Basic Science curriculum be retained and revised regularly to include new areas of scientific knowledge application to the society.*

Keywords: *Basic Science, Teachers, Science, Technology, Society.*

Introduction

Basic science (formerly known as integrated science) as a school subject is a subject which incorporates the basic science subjects of physics, chemistry and biology at upper level of Nigeria education system. It unifies the science subjects and emphasizes the interrelationship between them. Basic science teachers are teachers who have undergone teachers training and obtained a minimum of Nigeria certificate in Education with specialization in integrated science (Now Basic Science). Science technology and society (STS) has gained popularity worldwide. In the USA, STS is seen as area for identifying new goals, curriculum, modules, instructional strategies and approach of evaluation ***(Yager, 1990).*** In the UK, STS is taught as science and technology in society

(SATIS).Although, there is no separate curriculum for STS at the primary and post-primary levels of education in Nigeria, the infusion of STS concepts into existing curricula is common at various levels. For example, at the primary school level, under the theme of bulb and battery, we have such STS topics as lighting torch bulbs, conductors and insulators and common uses of electricity. The same is applicable in secondary and tertiary institutions.

Curriculum is a dynamic document which should be revised from time to time to cater for change in societal needs. An important stage in curriculum development is curriculum evaluation which aimed at determining whether the objectives of curriculum are being achieved or not. Therefore, this study looked at the relevance, adequacy and implementation of the new STS curriculum in Nigeria. Even though science, technology and society (STS) has now achieved recognition and visibility as a subjects in the school science curriculum of several countries, the nature of the course varies and depends strongly on the purpose for which it is being taught. It is essentially inter-disciplinary in that it aims to explore the interaction between science knowledge, knowledge application and social context which directs the endeavors and either benefits or suffers from results. At the secondary level of education in Nigeria, STS is not taught as a separate subject, they are included in the core curriculum for Basic Science at the Junior Secondary School level, and the other subjects of physics, chemistry and biology at the Senior Secondary School level. For example, the STS topics provided under each unit in the Basic Science curriculum which is the focus of this study is as presented in the table 1:

Table 1: Science, Technology and Society Study in the Nigerian Basic Science Curriculum

Unit	Topic
LIVING THINGS	Identifying self as a living thing. Human intelligence shown by his /her organization, problem solving skill etc.
FEEDING	Keeping teeth clean
EXCRETORY SYSTEM	Excreta are poisonous
RESPIRATORY SYSTEM CIRCULATORY SYSTEM	Problems connected with breathing need for respiration
	Blood defects or diseases Source: ***STAN (2001)*** fundamentals of science, technology and society.

Programmes in Science, Technology and Society were found in 1976 (STAN, 2001). The programme attempts to increase human understanding of the human build world. Science and technology are no longer specialized enterprise confined to factories and laboratories; they have become intertwined with each other and with human society. The fundamental contribution of STS is to look at the human built world as an integrated whole. There are two basic interrelated questions which are addressed by faculty and students in the programme of Science, Technology and Society. They are: (1) How did science and technology evolve as human activities? (2) How do they relate to larger civilization?

It is therefore difficult to separate curriculum from instruction where we are actually teaching in a classroom. According to Solomon and Aikenhead (1994), the curricular features of STS science teaching are based on four aspects of curriculum:

Function- what are the goals for teaching science through STS? Content- what should be taught?

Structure- how should the science and STS content be integrated? Sequence- how can we design STS instruction?

Holbrook (1992), opined that the man-made world around us today is based on technology. Science is less visible and yet to obtain a more technologically literate society, there is a need for people to receive a more relevant grounding in science. In the United States, efforts were made in the early years of education to create a science programme that would study science in the college (***Yager, 1991***). The value of STS as an interdisciplinary and multicultural significant approach to curriculum was made apparent in a submission by ***Solomon and Aikenhead (1994)***. In consideration of the relationship between science and society, one would consider the relationship between science and the rest of culture. It is common nowadays that people talk of the con-temporary period as the age of science and technology. Even people in the most rural areas of Nigeria

feel the impact of science and technology in some form or another. The effect of science and technology has therefore been towards improving the quality of life of individual and society. Science has contributed to human effectiveness by providing information on the care of human body through the means of preventing and curing human disease. The main purpose of this study was to find out the views of basic science teachers on the introduction of Science Technology and Society curriculum into basic science curriculum of upper basic level of Nigeria education system. Specifically, the study sought to find out the views of basic science teachers on:-

1. Whether difference exist in the views of experienced and less experienced teachers on the relevance of the STS curriculum to the secondary school level of education.

2. Whether difference exist in the views of experienced and less experienced teachers on the adequacy of the STS curriculum to the secondary schools of education.

3. Whether differences exist in the views of experienced and less experienced teachers on the implementation of STS curriculum to the secondary school level of education?

Answers were sought for the following research questions:

1. What are the views of experienced and less experienced teachers on the relevant of the STS

curriculum to the secondary school level of education?

2. What views do the experienced and less experienced teachers have on the adequacy of the STS

curriculum to the secondary schools of education?

3. What are the views of experienced and less experienced teachers on the implementation of STS

curriculum to the secondary school level of education? The following hypotheses were put to test:

1. There is no significant different between the views of experienced and less experienced teachers on the relevant of the STS curriculum to the secondary school level of education.

2. There is no significant different between the view of experienced and less experienced teachers on the adequacy of the STS curriculum to the secondary schools of education.

3. There is no significant difference between the views of experienced and less experienced teachers on the implementation of STS curriculum to the secondary school level of education.

Methodology

The study employed a descriptive method to determine and report the views of science teachers on the introduction of Science, Technology and Society into the secondary school curriculum in Kwara State. The target population for the study were science teachers in secondary schools in Ilorin Metropolis. There were a total no of 429 teachers, out of these population, 256 teachers were sampled using cluster sampling technique which enabled proportional participation by male and female teachers. The instrument for the study was a researcher designed questionnaire termed Science, Technology and Society Curriculum Questionnaire (STSCQ). It has two sections A and B, section A requests for demographic information of the respondents on their years of teaching experience while section B was designed to elicit response from the respondents, about the views of science teachers on the nature of science, technology and society into basic science curriculum. Section B consists of twenty two items. The items were separated into three parts. Part 1 sought to elicit response on the relevance of the STS components of the science curriculum, part 2 sought information on the adequacy while part 3 sought information on the implementation of the STS curriculum. Part 1 had four response mode of strongly agree, agree, disagree and strongly disagree. Part 2 had response modes of adequate and not adequate and part 3 had two response modes of yes and no.

Data Analysis

Data obtained as teachers' response on the views on the introduction of STS in secondary school curriculum in Kwara State were analyzed using frequency counts, percentage, mean and chi-square statistics. The hypotheses were put to test using chi-square statistics. Research question one states that:

'*What are the views of experienced and less experienced teachers on the relevance of the STS curriculum to the secondary school level of education?*' This research question translated to hypothesis one which states that there is no significant difference between the views of experienced and less experienced teachers on the relevance of the STS curriculum to the secondary school level of education.

Table 2: Chi- square analysis of the responses of experienced and less experienced science teachers to contents pertaining to relevance of the STS components of the Basic Science curriculum

S/N	Experience	Agreed	Disagreed	Total	^{2}	Df		Remark
	Experienced	180 (185.1)	26 (20.9)	206	7.024	1		S
	Less experienced	50 (44.9)	0 (5.1)	50				
2	Experienced	192 (193.1)	14 (12.9)	206	0.537	1		NS
	Less experienced	48 (46.9)	2 (3.1)	50				
3	Experienced	190 (191.5)	16 (14.5)	206	0.873	1		NS
	Less experienced	48 (46.5)	2 (3.5)	50				
4	Experienced	188 (188.3)	46 (45.7)	206	0.028	1		NS
	Less experienced	18 (17.7)	4 (4.3)	50				
5	Experienced	184 (183.5)	22 (22.5)	206	0.072	1		NS
	Less experienced	44 (44.5)	6 (5.5)	50				
6	Experienced	170 (173.8)	36 (32.2)	206	2.740	1		NS
	Less experienced	46 (42.2)	4 (7.8)	50				
7	Experienced	186 (186.7)	20 (19.3)	206	0.138	1		NS
	Less experienced	46 (45.3)	4 (4.7)	50				
8	Experienced	182 (183.5)	24 (22.5)	206	0.550	1		NS
	Less experienced	46 (44.5)	4 (5.5)	50				
9	Experienced	176 (178.6)	30 (27.4)	206	1.505	1		NS
	Less experienced	46 (43.4)	4 (6.6)	50				
10	Experienced	162 (157.7)	44 (48.3)	206	2.539	1		NS
	Less experienced	34 (38.3)	16 (11.7)	50				
11	Experienced	132 (135.2)	74 (70.8)	206	1.119	1		NS
	Less experienced	36 (32.8)	14 (17.2)	50				

Key: 10 are NS and 1 S

Table 3: Chi-square analysis of average overall of the responses of experienced and less experienced science teachers to contents pertaining to relevance of the STS components of the Basic Science

curriculum.

S/N	Variable	Agreed	Disagreed	Total	^{2}	df	Remark
1.	Experienced	196 (194.7)	10 (11.3)	206	0.770	1	NS
2.	Less experienced	46 (47.3)	4 (2.7)	50			
	Total	242	14	256			

From Table 2, the Chi-square calculated (^{2}) was 0.770, while the table value was 3.84 at 0.05 alpha level, with 1 degree of freedom, therefore $H_{01}$is not rejected. This shows that the there is no significant difference between the opinions of experienced and less experienced teachers on the relevance of the STS curriculum to the secondary school level of education. The above hypothesis was tested in each of the items for the relevance of the STS curriculum to the secondary school level of education and the results were presented in Table 1. In this table, the calculated chi-square (^{2}) was less than the table value (3.84) at 0.05 alpha level with degree of freedom of 1 except for content

1 in which the chi-square 7.024 was greater than the table value (3.84). It shows therefore that on

the average, there is no significant difference between the opinions of experienced and less experienced teachers on the relevance of the STS curriculum to the secondary school level of education.

Research question two states that: *What are the views of experienced and less experienced teachers on the adequacy of the STS curriculum to the secondary school level of education*? This research question translated to **Hypothesis two** which states that there is no significant difference between the views of experienced and less experienced teachers on the adequacy of the STS curriculum to the secondary school level of education.

Table 4: The number and percentages of teachers' responses to contents pertaining to adequacy of the STS components of the Basic Science curriculum

S/NO	CONTENTS	Adequate	Inadequate	Total
1	The quantity of Biology-related topics	218 (85.2%)	38 (14.8%)	256
2	The quantity of Chemistry-related topics	206 (80.5%)	50 (19.5%)	256
3	The quantity of Physics-related topics	190 (74.2%)	66 (25.8%)	256
4	The quantity of Health-related topics	152 (59.4%)	104 (40.6%)	256
5	The quantity of Agric-related topics	198 (77.3%)	58 (22.7%)	256
6	The quantity of Technology-related topics	142 (55.5%)	114 (44.5%)	256
7	The inter-relatedness of the topics	166 (64.8%)	90 (35.2%)	256
8	Overall responses to adequacy of the STS components of the basic science curriculum	200 (78.1%)	56 (21.9%)	256

Table 5:Chi-square analysis of average overall of the responses of experienced and less experienced science teachers to contents pertaining to adequacy of the STS components of the Basic Science curriculum

S/N	Variable	Adequate	Inadequate	Total	^{2}	df	Remark
1.	Experienced	164 (160.9)	42 (45.1)	206	1.364	1	NS
Z	Less experienced	36 (39.1)	14 (10.9)	50			
	Total	200	56	256			

From Table 5, the Chi-square calculated (^{2}) was 1.364, while the table value was 3.84 at 0.05 alpha level, with 1 degree of freedom, therefore HO_2 is not rejected. This shows that the there is no significant difference between the opinions of experienced and less experienced teachers on the adequacy of the STS

curriculum to the secondary school level of education. The above hypothesis was tested in each of the items for the adequacy of the STS curriculum to the secondary school level of education and the results were presented in Table 4. In this table, all the calculated chi-square (^{2}) was less than the table value (3.84) at 0.05 alpha level with degree of freedom of 1. It shows therefore that there is no significant difference between the views of experienced and less experienced teachers on the adequacy of the STS curriculum to the secondary school level of education.

Research question three states that: What are the views of experienced and less experienced teachers on the implementation of the STS curriculum to the secondary school level of education? This research question translated to **Hypothesis three** which states that there is no significant difference between the views of experienced and less experienced teachers on implementation of the STS curriculum to the secondary school level of education.

Table 6: Chi- square analysis of the responses of experienced and less experienced science teachers to contents pertaining to implementation of the STS components of the Basic Science curriculum

S/N	Experience	Yes	No	Total	^{2}	df	Remark
1	Experienced	184 (186.7)	22 (19.3)	206	2.113	1	NS
	Less experienced	48 (45.3)	2 (4.7)	50			
2	Experienced	116 (114.3)	90 (91.7)	206	0.303	1	NS
	Less experienced	26 (27.7)	24 (22.3)	50			
3	Experienced	96 (91.7)	110 (114.3)	206	1.831	1	NS
	Less experienced	18 (22.3)	32 (27.7)	50			
4	Experienced	128 (128.8)	78 (77.3)	206	0.060	1	NS
	Less experienced	32 (31.3)	18 (18.8)	50			
5	Experienced	136 (130.4)	70 (75.6)	206	3.403	1	NS
	Less experienced	26 (31.6)	24 (18.4)	50			
6	Experienced	98 (91.7)	108 (114.3)	206	3.950	1	S
	Less experienced	16 (22.3)	34 (27.7)	50			
	Less experienced	30 (28.1)	20 (21.9)	50			
8	Experienced	110 (115.9)	112 (112.0)	206	3.486	1	NS
	Less experienced	34 (28.1)	16 (21.9)	50			
9	Experienced	74 (85.3)	132 (120.7)	206	13.074	1	S
	Less experienced	32 (20.7)	18 (29.3)	50			

7 NS and 2 S

Table 7: Chi-square analysis of average overall of the responses of experienced and less experienced science teachers to contents pertaining to implementation of the STS components of the basic Science curriculum

S/N	Variable	Yes	No	Total	^{2}	df	Remark
1.	Experienced	128 (128.8)	78 (77.3)	206	0.060	1	NS
2.	Less experienced	32 (31.3)	18 (18.8)	50			
	Total	160	96	256			

From Table 7, the Chi-square calculated (^{2}) was 0.060, while the table value was 3.84 at 0.05 alpha level, with 1 degree of freedom, we therefore *do not* reject HO_3. This shows that the there is no significant difference between the views of experienced and less experienced teachers on the implementation of the STS curriculum to the secondary school level of education. The above hypothesis was tested in each of the items for the implementation of the STS curriculum to the secondary school level of education and the results were presented in Table 6. In this table, the calculated chi-square (^{2}) was less than the table value (3.84) at 0.05 alpha level with degree of freedom of 1 except for content 6 and 9 with chi-square value of 3.950 and 13.074 respectively, which were greater than the table value (3.84). It shows therefore that on the average, there is no significant difference between the views of experienced and less experienced teachers on the implementation of the STS curriculum to the secondary school level of education.

Summary of the Major Findings

1. There is no significant difference between the views of experienced and less experienced teachers on the relevance of the STS curriculum to the secondary school level of education.
2. There is no significant difference between the views of experienced and less experienced teachers on the adequacy of the STS curriculum to the secondary school level of education.
3. There is no significant difference between the views of experienced and less experienced teachers on implementation of the STS curriculum to the secondary school level of education.

Discussion

It was found out in this study that there was no significant difference between the views of experienced and less experienced Basic Science teachers on the relevance, adequacy and implementation

of the STS curriculum to the secondary school level of education. By implication, experienced and less experienced Basic Science teachers have similar views on the relevance, adequacy and implementation of the STS curriculum. In other words the views of the Basic Science teachers were not influenced by their level of experience. While most of the respondents responded favourably to the relevance and adequacy of the STS component of the Basic Science curriculum, a higher percentage of them responded negatively to the implementation, even though the percentage of those who responded positively to the implementation was higher. In other words, there were more negative total responses for implementation than for relevance and adequacy.

Available studies in the literature, known to the researcher do not touch directly on how the variables of teachers' experience, influence teachers' views on any STS curriculum. The available write ups are mainly essays giving explanations on the relationships between science, technology and society. Examples of such include the works of Ajewole (2005) who merely examined the use of manpower development in STS education in Nigeria. He looked at the historical context of some policies in of science education in Nigeria and the advanced countries and noted the poor achievement of science and technology education in secondary schools. He concluded that there was an urgent need for manpower for the STS based subjects. Maduemezia (1997) also presented a graphic picture of the problems bedeviling science, technology and mathematics education in Africa and stated that there was hardly any doubt in anybody's mind in terms of the quantum of scientific and technological knowledge that exists in the world today and is available for tapping by all and sundry. Earlier on, Bybee, Buchwald, Crissman, Heil and Kuebis (1989) had given a detailed explanation of the interrelationship between science, technology and society.

Conclusion

It was found out in this study that there was no significance difference between the views of experienced and less experienced Basic Science teachers on the relevance, adequacy and implementation of the STS curriculum to the secondary school level of education. By implication, experienced and less experienced Basic Science teachers have similar views on the relevance, adequacy and implementation of the STS curriculum. In other words the views of the Basic Science Teachers were not influenced by their level of experienced. While most of the respondents responded favourably to the relevance and adequacy of the STS component of the Basic Science Curriculum, a higher percentage of them responded negatively to the implementation, even though the percentage of those who responded positively to the implementation was higher.

Recommendations

Based on the findings of this study, the following recommendations are put forward:

1. Since the views expressed by the experienced and the less experienced teachers on the relevance, adequacy and implementation of STS to the Basic Science curriculum are similar, the views expressed by the teachers should be taken seriously and taken into consideration by curriculum developers, so that a better Basic Science curriculum can be formulated.

2. Students should be provided with the opportunity to see and witness the application of scientific knowledge to societal needs by taking them to establishments where scientific knowledge are directly utilized in production.

3. A few of the teachers who were approached to respond to the questionnaire claimed ignorance of the STS curriculum, therefore, it is recommended that seminars, workshops and conferences be organized for Basic Science teachers to enlighten them on it so that they can use the STS approach in their teaching.

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