THE EFFECT OF E-LEARNING ON STUDENTS LEARNING AND ACHIEVEMENT IN ELECTRICAL/ELECTRONICS IN TECHNICAL COLLEGES IN NIGER STATE

BY

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2008/2/31492BT

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

FEDERAL UNIVERSITY OF TECHNOLGY,

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OCTOBER, 2012.

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION, SCHOOL OF SCIENCE AND SCIENCE EDUCATION FEDERAL UNIVERSITY OF TECHNOLGY, MINNA.

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OCTOBER, 2012.

CERTIFICATION

I LEKWA CHUKWUEMEKA UKOHA Matric No. 2008/2/31492BT an undergraduate student of the department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

Name

Signature

APROVED PAGE

This project has been read and approved as meeting the requirement for the award of B.Tech Degree in Industrial and Technology Education of the Department of Industrial and Technology Education, School of Science and Science Education, Federal University of Technology, Minna.

.....	.....
Supervisor	Sign/Date
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Head of Department	Sign/Date
.....	.....
External Supervisor	Sign/Date

DEDICATION

This project is dedicated to the Almighty God who made it possible for me to complete this project successfully.

ACKNOWLEDGEMENT

All I have to say is, thank you lord.

I give my greatest appreciation to the Almighty God and His son Jesus Christ for His Love, care, provision, strength and grace given to reach this level of academic attainment.

First of all I sincerely appreciate Mallam.A.M.Idris my action supervisor who had through his honest criticisms and kind suggested facts that made this project worth-while even though they were hiding to me. For this academic job well done, a good number of notable men and women had sacrificially contributed their quota. Time will fail me to mention them all. Nevertheless I did acknowledge every one of them far and near.

My profound and whole-heart gratitude goes to my father Prof. Morgan Lekwa and my mother Mrs Love Lekwa for care, love, support and prayers throughout my school time, may they live to enjoy the good of God and the labour of their work. I also appreciate my cousin Godwill Lekwa, and my Siblings, Samuel Lekwa, Godwill Lekwa, Micheal Lekwa, God bless u all.

Finally I appreciate my friends, church members and well wishers, God bless u all for all you did for me throughout my stay in school and to the success of this project.

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ABSTRACT

The study investigated the effect of e-learning on students learning and achievement in electrical/electronic in technical colleges in Niger State. A questionnaire method was used to collect data and is being distributed to all the four technical colleges. The purpose of this study include: to be able to determine the effects of E-learning on student's performance, also determine the possible challenges faced by E-learning and the strategies needed to enhance effective learning through E- learning.

Three research questions were used, which contain 30 items and are being distributed to 125 respondent and 116 were collected, Some of the findings being derived from the respondents include: There is more flexibility in terms of when to study and where learning will take place when using e-learning, e-learning increases independent skills, among others.

Some recommendations from the study are: The Government and the institution should provide adequate computer in order to enhance the electronic learning, Electrical and electronic teachers should undergo in-service training in other to acquire the knowledge of handling e- learning material, and Effort should be made in motivating the students in other for them to develop interest in e- learning.

CHAPTER I

INTRODUCTION

Background of the Study

E-learning is construed in a variety of contexts, such as distance learning, online learning and networked learning (Wilson, 2001). In the context of this paper it will considered to describe e-learning that utilizes information communications technology (ICT) to promote educational interaction between students, lecturers and learning communities (Holley, 2002). Volery (2000) argues that the fast expansion of the Internet and related technological advancements, in conjunction with limited budgets and social demands for improved access to higher education, has produced a substantial incentive for universities to introduce eLearning courses. Volery stressed further that, if universities do not embrace E-Learning technology that is readily available, they will be left behind in the pursuit for globalization. Ribiero (2002) argues that if universities are to maximize the potential of E-learning as a means of delivering higher education, they must be fully aware of the critical success factors concerned with introducing online models of education.

Many commentators describe the relative benefits of E-learning in higher education; however, there are ramifications for unprepared, technology focused institutions, when trying to implement distance learning courses. O'Hearn, (2000), contends that university structures are rigid and unproven, regarding the incorporation of technological advancements. Holley (2000) states that E-learning is difficult to implement without the full cooperation and support of lecturers, as the degree of interaction between lecturers and students is still predominant in eLearning environments, Finally, are traditional universities able to compete with other independent education providers in relation to social demands for 'lifelong learning' and globalised education services? (O'Hearn, 2000).

Over the past decade the structure of higher educational institutions has changed, partly due to the introduction of technological initiatives. Scott (2000) supports this opinion and contends that as E-learning is now facilitating a more flexible learning approach; contemporary institutional structures are less robust than in previous years. In addition, Shaba (2000) states that technology in general has not only improved knowledge storing methods and learning techniques but has also acted as a catalyst to combat the barrier of inflexible organizational structures. This view suggests that to fully experience the benefits of technological advancements in higher education, such as eLearning, universities must have flexible organizational structures. According to Scott (2000), the structure of today's universities must be 'changeable' in order to integrate distance learning courses, and those institutions that will not or cannot change their structure to incorporate this technology may be bypassed by other educational providers, such as virtual universities and independent educational services. It might well be the case that corporate universities which hitherto only offered training to its employees will be in competition with the higher education sector.

Darling (2002) argues that such a wide acceptance of eLearning methods in higher educational institutions will create broader repercussions regarding organizational structure. This point is illustrated by Shaba (2000) who suggests that universities are currently inexperienced concerning the acceptance and incorporation of eLearning and other technological changes into their organizational structures. Shaba (2000) considers that this lack of experience will initiate the following reactions within universities. Firstly, ambiguity towards future technology strategy and how to incorporate new technological advancements into organizational structure and secondly, how to cope with the diverse range of teaching courses and learning programmes ongoing within the university comprising of full time and part time students. Shapiro (2000) suggests one of the challenges facing traditional universities intending to transform organizational structure to incorporate technological innovations is

coming to terms with the process design for distance learning courses, without ignoring the organizational, managerial and financial constraints.

Although advocates of traditional approaches to higher education may argue that courses should be taught in fixed locations using somewhat rigid organizational structures, the opinions of many writers suggest that eLearning methods will greatly change future higher educational systems. Volery (2000) describes how the broadening geographic distribution, flexible learning environments and variety of educational models that are offered by distance learning facilitate improved education, and if universities do not embrace this technology they will be left behind in the pursuit for globalization and technological development. E-learning includes all forms of electronically supported learning and teaching, and more recently Educational technology. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process.[1] The term will still most likely be utilized to reference out-of-classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. Abbreviations like CBT (*Computer-Based Training*), IBT (*Internet-Based Training*) or WBT (*Web-Based Training*) have been used as synonyms to E-learning.

E-learning is the computer and network-enabled transfer of skills and knowledge. E-learning applications and processes include Web-based learning, computer-based learning, virtual education opportunities and digital collaboration. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio. It is commonly thought that new technologies can strongly help in education. In young ages especially, children can use the huge interactivity of new media, and develop their skills, knowledge, perception of the world, under their parents monitoring, of course. Many proponents of E-learning believe that everyone must be equipped

with basic knowledge in technology, as well as use it as a medium to reach a particular goal. By 2006, 3.5 million students were participating in on-line learning at institutions of higher education in the United States. According to the Sloan Foundation reports, there has been an increase of around 12–14 percent per year on average in enrollments for fully online learning over the five years 2004–2009 in the US post-secondary system, compared with an average of approximately 2 per cent increase per year in enrolments overall.

Allen and Seaman (2009) claim that almost a quarter of all students in post-secondary education were taking fully online courses in 2008, and a report by Ambient Insight Research suggests that in 2009, 44 percent of post-secondary students in the USA were taking some or all of their courses online, and projected that this figure would rise to 81 percent by 2014. Thus it can be seen that E-learning is moving rapidly from the margins to being a predominant form of post-secondary education, at least in the USA. Many higher education's, for-profit institutions, now offer on-line classes. By contrast, only about half of private, non-profit schools offer them. The Sloan report, based on a poll of academic leaders, indicated that students generally appear to be at least as satisfied with their on-line classes as they are with traditional ones. Private institutions may become more involved with on-line presentations as the cost of instituting such a system decreases. Properly trained staff must also be hired to work with students on-line. These staff members need to understand the content area, and also be highly trained in the use of the computer and Internet. Online education is rapidly increasing, and online doctoral programs have even developed at leading research universities.

E-learning is also utilized by public K–12 schools in the United States as well as private schools. Some E-learning environments take place in a traditional classroom; others allow

students to attend classes from home or other locations. There are several states that are utilizing cyber and virtual school platforms for E-learning across the country that continued to increase. Virtual school enables students to log into synchronous learning or asynchronous learning courses anywhere there is an internet connection. Technological kits are usually provided that include computers, printers, and reimbursement for home internet use. Students are to use technology for school use only and must meet weekly work submission requirements. Teachers employed by K–12 online public cyber schools must be certified teachers in the state they are teaching in. Some Cyber schools allow for students to maintain their own pacing and progress, course selection, and provide the flexibility for students to create their own schedule.

Statement of problem

E-learning has brought about effective learning in Technical colleges, which has resulted to better performance at final examination. E–Learning can be presented as a new method for teaching. It is very useful but with some problems to change the systems that work nowadays. The main problems appeared to be the old mentality and lack of technology. This has in no small measure effects on students learning. Another problem is lack of maintenance culture; it is not all about making the instrument needed to enhance e – learning amongst students but the ability to maintain them to ensure that they are always in good working condition. In looking at this, one would want to know the effects and achievements of e – learning on students learning process. How e–leaning would be improved to ensure effective learning process. E-learning is increasingly being utilized by students who may not want to go to traditional brick and mortar schools due to severe allergies or other medical issues, fear of school violence and school bullying and students whose parents would like to home school but do not feel qualified. Cyber schools create a safe haven for students to receive a quality education while almost completely

avoiding these common problems. Cyber charter schools also often are not limited by location, income level or class size in the way brick and mortar charter schools are.

E-learning has now been adopted and used by various companies to inform & educate both their employees and customers. Companies with large and spread out distribution chains use it to educate their sales staff as to the latest product developments without the need of organizing physical courses. Compliance has also been a big field of growth with banks using it to keep their staff's CPD's level up.

Purpose of Study

The major purpose of this study was to identify the effects of E-learning in student's performance in the Technical colleges in Niger State. Specifically this study:

1. Determined the effects of E-learning on student's performance.
2. Determined the possible challenges faced by E-learning.
3. Determined the strategies needed to enhance effective learning through E- learning.

Significance of Study

This study when successfully completed will be a guide to all students, lecturer and Educational Administrators on the effects of the use of E-learning on student's performance. The significance of the study is also to draw the attention of other resources to the field of education, to be interested in the conduct of more indebt researcher in the area of student effective learning. The idea will act as a frame work that is to put the plan together to direct educationist on how to make learning more effective in Nigeria.

This study will also induce student, business men and drop out to proper education. This write up is expected to teach young learns and serve as history for than during their own time of educational administration

The study is also of benefits to the government as it helps in the regulation of E-learning in educational sector. The study will also help in the employment opportunities which is one of the social problem facing Nigeria as a whole and Niger State in particular. The result of these findings will also encourage the further research of more ways to better the performance in learning just as mans' standard of living increases by the day.

Scope of Study

This study is delimiting to the effects of E-learning on students performance and it's achievements over the years in Niger state technical colleges. This study will not cover an assessment of other places where E-learning is generally accepted apart from Niger state.

Research Questions

The following research questions were formulated to guide this research project:-

1. What are the effects of E-learning in student's performance?
2. What are the possible challenges faced by the use of E-learning?
3. What are the strategies that can enhance effective E-learning?

Hypotheses

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

HO_1: There is no significant difference between the mean responses of technical teachers and the students on the effects of E-learning in student's performance.

HO_2: There is no significant difference between the mean responses of technical teachers and the students on the strategies that can enhance effective E-learning.

Assumption of Study

The following assumptions were made in carrying out the study

1. The students were sincere enough to respond objectively to the items on the instrument administered to them.
2. Responses from the respondents provided valid information for realistic decision about the effects of E-learning and whether there is any needed improvement

CHAPTER II

LITERATURE REVIEW

Much have been said and written about the e– learning and its effects on student are learning. E–Learning is very important in learning for learning to be effective proper planning on e – planning on e- learning is vital. Based on this fact, the researcher wants review related literature in this area of study as organised under the following sub-headings.

- Historical background of E-learning.
- Effects of E-learning in Education.
- The Role of Teaching Staff In E-learning
- E-learning as in Enhanced Teaching Tools
- Training Staff in eLearning Techniques
- The Learning Environment
- The Effects Of eLearning In Technical Colleges
- Achievements of E-learning
- Challenges of E-learning
- Necessity of E-learning
- Benefits of E-learning
- Summary of the review.

Historical background of E-learning.

In the early 1960s, Stanford University psychologists Professor, Patrick Suppes and Richard C. Atkinson experimented with using computers to teach math and reading to young children in elementary schools in East Palo Alto, California. Stanford's Education Program for

Gifted Youth is descended from those early experiments. In 1963, Bernard Luskin installed the first computer in a community college for instruction, working with Stanford and others, developed computer assisted instruction. Luskin completed his landmark UCLA dissertation working with the Rand Corporation in analyzing obstacles to computer assisted instruction in 1970. Early E-learning systems, based on Computer-Based Learning/Training often attempted to replicate autocratic teaching styles whereby the role of the E-learning system was assumed to be for transferring knowledge, as opposed to systems developed later based on Computer Supported Collaborative Learning (CSCL), which encouraged the shared development of knowledge.

As early as 1993, William D. Graziadei described an online computer-delivered lecture, tutorial and assessment project using electronic mail. By 1994, the first online high school had been founded. In 1997 Graziadei, W.D., et al., published an article entitled "Building Asynchronous and Synchronous Teaching-Learning Environments: Exploring a Course/Classroom Management System Solution". They described a process at the State University of New York (SUNY) of evaluating products and developing an overall strategy for technology-based course development and management in teaching-learning. The product(s) had to be easy to use and maintain, portable, replicable, scalable, and immediately affordable, and they had to have a high probability of success with long-term cost-effectiveness. Today many technologies can be, and are, used in E-learning, from blogs to collaborative software, ePortfolios, and virtual classrooms. Most eLearning situations use combinations of these techniques.

Effects of E-learning in Education.

In 2000, Shaba in a research study on the effects of Technology on Education. He found out that technology in general has not only improved knowledge storing methods and learning techniques but has also acted as a catalyst to combat the barrier of inflexible educational structures. This view suggests that to fully experience the benefits of technological advancements in higher education such as E-learning educational structure must have flexible structure. Based on these findings the researcher concluded that E-learning affects students learning positively. This conclusion was based on the data collected from a sample of 100 students and 25 educationists from ministry of Education. The research indicated that technological advancement has made educational structure flexible with particular reference to higher institution of learning. Gurmak Singh, John O'Donoghue, Harvey Worton Journal of University Teaching and Learning Practice 15 said that The impact of eLearning initiatives will have direct effects on the future structure of universities on both strategic and tactical levels (Shaba 2000). Strategically, universities will experience issues concerning face to face versus virtual environments, how many buildings to keep and most importantly whether to maintain the existing organizational framework. On a tactical level, the changing role of lecturers, the changeable learning environment and the design of eLearning facilities will all contribute to a potentially more flexible organizational structure. Despite the apparent dysfunctional effects the implementation of distance learning techniques can assert on university structure, O'Hearn (2000) adds that contemporary university structures must be changeable and adaptable, able to embrace new learning and communications technology offered through eLearning, or faces the consequence of limiting students direct access to global knowledge repositories that have the ability to extend higher education.

Darling (2002) asserts that a number of established universities are embracing the use of technology in higher education, especially in distance learning disciplines, without understanding or addressing the business or educational requirements. In the opinion of Shapiro (2000) this could be fatal for universities, who must not let fundamental educational processes be overshadowed by the implementation of new information technology strategy. The inference is that universities which do not incorporate eLearning effectively as part of an overall learning strategy will do so at the expense of survival.

The above considered a variety of views regarding the effect and potential effect eLearning can have on universities as organizations. The use of advanced technology in higher educational is inevitable (O'Donoghue, Singh and Dorward, 2001), it will contribute to the demise of communicational, geographical and inflexible learning boundaries. Henry (2002) remarks that when organizations participate in restructuring internal processes, eLearning will assist in optimizing business processes and will eradicate inefficiencies through shared knowledge and improved communication between departments and employees. To be successful within any organization, the evidence suggests that eLearning must be implemented as part of an organizational strategy to support learning. Shapiro (2000) argues that eLearning requires systematic implementation and if not structured properly could lead to chaos. Darling (2002) states that for higher educational institutions, an effective strategy does not assure success, as the technical issues in distance learning delivery will always be significant. Perhaps, this point highlights the inexperience of universities with regards to incorporating technology effectively, and justifies the need for external partnerships and alliances. This is particularly so for aspects of infrastructure and internal change management structures. This view is supported by Teare (2000) who comments that through alliances with organisations, eLearning course material can be designed to challenge students in real business situations in addition to

underpinning academic endeavor. Rather than a paradigm shift to an online model, a delicate balance needs to be established between the more formal traditional structures and procedures of the university and the new administrative functions required to rapidly respond to changes in the online education market and ensure competitive advantage and ultimate survival of the virtual campus.

Gurmak Singh, John O'Donoghue, Harvey Worton Journal of University Teaching and Learning Practice 19 However, although eLearning environments overcome the traditional time and space constraints, universities must be cautious when deciding if distance learning environments should replace the traditional methods, as students recognize the benefits of the eLearning environments but only when combined with traditional formats (Serwatka 2002).

Many writers propose that the current significant limitations of eLearning environments are not exposed by contemporary research. O'Connell (2002) proposes that student from non-technical backgrounds or those who are more accustomed to traditional face to face learning environments, experience problems absorbing course material in eLearning environments. Similarly, Holley (2002) suggests that even undergraduate students who are perhaps more assertive and motivated should be given focused training on how they can take full advantage of eLearning environments. IT skills can prove problematic for students on distance learning courses and if the requirement for training is not addressed, students will not experience the full benefits of the eLearning environment (Holley 2002).

Furthermore, a lack of IT skills is one of the main reasons for student non-participation in eLearning courses (Wilson 2001). Whilst not looking to replace 'real' paper with technology based resource, it is the process of augmentation and enhancement with the 'traditional' resources to enable reflection, encapsulation, consolidation and extension of the written word.

The Role of Teaching Staff in E-learning

The dynamic nature of the IT industry in conjunction with evolving eLearning technologies has created a tension for lecturers in higher education. ELearning initiatives have reportedly created new educational issues for lecturers, such as changing work patterns and in some cases the reluctant integration of technology. Serwatka (2002) argues that sometimes student success can be achieved simply by preventing student withdrawals from eLearning programmes. The teaching techniques used by lecturers in traditional courses may also have to be reviewed and modified, as they do not always prove effective or necessarily transferable in eLearning environments (Serwatka 2002). Lecturers in networked learning environments modify their courses as they go along, meaning the longer a course is taught in a particular format the more effective it is (Volery 2000).

Many suggest that rather than changing the role of the lecturer, it will gradually disappear completely with the rise of improved eLearning technologies and methodologies. At Carnegie Mellon University (CMU) in America they exercise the concept of a ‘wired campus’, in which all students learn in a number of disciplines via eLearning. At CMU the traditional lecturer is considered a relic of the past that should be replaced by electronic tutors. Scott (2000) explains how in the future these electronic tutors at CMU will act as virtual teachers, if students make a mistake the tutor will be informed automatically and will offer helpful hints. Scott (2000) argues that virtual tutors will out perform traditional face to face techniques because in traditional lectures vital information flows past students, whereas the virtual tutor can wait until a student demonstrates a clear understanding of the information or knowledge repository. Rigid information management mechanisms which incorporate tutor invention and involvement must be facilitated in a variety of ways, as they would within the contexts of class based activity.

Volery (2000) maintains that technical expertise on its own is not of great value unless lecturers conceive effective ways to utilize it. Lecturers will always play a key role in the effective delivery of E-learning initiatives, as it is the lecturer not the technology that facilitates the students learning experience. Wilson (2001) suggests that three characteristics of the lecturer will control the degree of learning; attitude towards technology, teaching style and the control of technology.

In support of this view Holley (2002) concludes that students will experience a more positive learning experience if guided by a lecturer who retains a positive attitude towards traditional learning whilst promoting eLearning methods. The accepted acronym for such exposure being called 'Blended Learning', Blended learning is an important building block of the new schoolhouse that offers students both flexibility and convenience, important characteristics for working adults who decide to pursue postsecondary degrees. Blended learning is a hybrid of traditional face to face and online learning so that instruction occurs both in the classroom and online, and where the online component becomes a natural extension of traditional classroom learning (Colis and Moonen 2001).

E-learning as in Enhanced Teaching Tools

The future delivery of education is envisaged through eLearning technology providing lecturers with superior teaching tools. Volery (2000) argues that online methods facilitate more effective education and offer significant advantages over traditional teaching methods. This can be via full blown technological implementation or limited technology based environments such as bulletin boards, virtual lectures and e-Libraries. McClelland (2001) contends that in eLearning environments lecturers can offer constant educational support, as students are able to communicate with classmates and lecturers, visit web sites and view course material regardless of their time and location. To maximize the potential of eLearning teaching tools Holley (2000) advocates two methods to modify

the learning process. Firstly, educational re-engineering that will revolutionize classroom practices and secondly educational fortification that will improve the learning courseware through technology.

Despite the apparent advantages of eLearning teaching tools there appear to be certain practical problems with regard to utilizing these techniques in educational learning environments. Teare (2000) explains that initially the process of teaching via eLearning may demonstrate features of educational enrichment but in reality eLearning methods prove highly problematic. Teare's (2000) studies suggested that some students who participated in online learning courses found the delivery of course content impractical and frustrating due to technological failures. These finding's imply that the problems with eLearning initiatives are not the value of the delivery methods but the reliability of the technology supporting them. Volery (2000) identified that university student who participated in Virtual lectures found the experience rewarding and rated them as a valuable learning tool. However, nearly two thirds of the students in the class did not participate fully because of technical problems i.e. frustrations in trying to connect and utilize the networked systems.

It seems that the teaching tools associated with eLearning may have the potential to equip lecturers in higher education with flexible channels and a model for the delivery of courses. Web based learning allows lecturers to disseminate up to date course content in relatively no time at all and students can complete courses just-in-time, giving them the opportunity to apply knowledge in contemporary situations (Teare 2000). ELearning courses can be structured and aligned with the requirements of today's workforce (Volery 2000). Also, teaching methods such as virtual lectures, sustain group interaction whilst broadening the flexibility of communication between students, indicating that E-learning teaching methods enhance student interaction and offer a flexible alternative to traditional time and place constraints (Holley 2000). However, many authors debate eLearning

programmes regarding the reliability of technology versus the apparent advantages of learning delivery methods.

Perhaps the reported technological failures are simply teething problems in the early life of the E-learning revolution and whilst there will always be fundamental problems integrating computers with humans in education (Scott 2000) the teaching techniques in eLearning offer lecturers enhanced teaching tools that are capable of moving higher education into the information age.

Training Staff in E-Learning Techniques

Recent studies indicate that the success of eLearning methods in higher education can only be measured according to the effectiveness of delivery; training staff may be regarded as a major challenge in the adoption of eLearning initiatives. It is acknowledged that some academics working in higher education are reluctant in accepting aspects of technology in their teaching and learning.

Charlesworth (2002) adds that contemporary lecturers are not resistant to training in the use of technological applications; they are simply confused as to how to implement such into lectures or more formal teaching methods. Lecturers that enter the profession in today's information age are much more likely to have used computers and have significant access to the Internet than those in previous years and are more likely to accept technological advances in teaching methods. (Wilson 2001). Academics are often encouraged to "go online" by their institution, by either moving or supplementing teaching in an online environment. This could simply be attempting to replicate face to face teaching, in effect changing nothing; enhancing face to face teaching with the available technology; or transforming face to face teaching by the available technology. The approach chosen will be determined by several factors, one of which will be existing knowledge of the technological environment being used (Coldwell 2003)

Educators must be involved in all stages of eLearning course development, including determining the prospective audience, the purpose of the learning programme and the best format (Shank 2002). This view highlights the requirement for lecturers not only to be trained how to apply eLearning technology in higher education but also be attentive of the theories behind distance based learning. Proficient training includes both technical and conceptual issues, and if executed correctly will generate increased support for the merits of eLearning (Shapiro 2000). Lecturers must possess the appropriate facilitation skills if eLearning courses are to be successful. Shank (2002) argues that facilitation skills fall into three sections, facilitating real time events, moderating online discussions and coaching students. Shank (2002) continues, that if lecturers do not maintain a high level of facilitation skills, even the most effectively designed eLearning courses will be unsuccessful through inattention on behalf of the lecturer.

The evidence suggests that staff training is a central concern for universities implementing distance learning methods. It is essential that the opportunity to redesign and improve university teaching practices through eLearning is not usurped by a focus on training lecturers how to use the hardware and software (Shapiro 2000). Inadequately trained lecturers using eLearning in educational environments can become an obstacle in a finely balanced learning process and can lead to problems in application use and in the perception of students (Volery 2000). In contrast to traditional teaching skills, eLearning requires lecturers themselves to be committed to a constant and changing learning curve, which may involve an mixture of formal training courses in conjunction with conferences and other less formal techniques, if they are to acquire and develop the skills needed to be an effective eLearning tutor (Shank 2000).

Lecturers in higher educational institutions must accept and embrace technological advancements offered by eLearning. Holley (2002) explains that lecturers have to adopt new

educational approaches in order to maintain the quality of courses. Collectively, the evidence offered on the role of lecturing staff in contemporary eLearning courses suggests that online learning should not be regarded as an alternative to a traditional tutor. Effective eLearning programmes use lecturing staff combined with the appropriate technology to deliver effective learning. In addition, the lecturer is not only the knowledge source but is also a knowledge navigator using the Internet as a teaching tool. This enables lecturers to transfer their skills in other business areas such as developing training and corporate courses (Ribiero 2002).

The Learning Environment

There is a notion that an eLearning environment offers students an improved learning experience when compared to a more traditional learning environment. Holley (2002) found that student participants on eLearning university courses using techniques such as virtual lectures and bulletin boards, achieved better grades than students who studied in traditional learning settings. Hartley (2000) maintains that the constraints of conventional university teaching practices with regards to group working are removed in eLearning environments, as students can participate in group activities without actually being situated in the same location. Indeed alternative relationships are developed within the context of an online community (O'Donoghue and Singh, 2001). This supports the view that eLearning environments loosen the time and space restrictions associated with traditional university practices.

The Effects of E-learning In Technical Colleges

Although eLearning environments overcome the traditional time and space constraints, universities must be cautious when deciding if distance learning environments should replace the traditional methods, as students recognize the benefits of the eLearning environments but only when combined with traditional formats (Serwatka 2002). Many writers propose that the current significant

limitations of eLearning environments are not exposed by contemporary research. O'Connell (2002) proposes that students from non-technical backgrounds or those who are more accustomed to traditional face to face learning environments, experience problems absorbing course material in eLearning environments. Similarly, Holley (2002) suggests that even undergraduate students who are perhaps more assertive and motivated should be given focused training on how they can take full advantage of eLearning environments. IT skills can prove problematic for students on distance learning courses and if the requirement for training is not addressed, students will not experience the full benefits of the eLearning environment (Holley 2002).

Furthermore, a lack of IT skills is one of the main reasons for student non-participation in eLearning courses (Wilson 2001). Whilst not looking to replace 'real' paper with technology based resource, it is the process of augmentation and enhancement with the 'traditional' resources to enable reflection, encapsulation, consolidation and extension of the written word.

Student Performance

The above suggests that students enrolled on eLearning courses perform better than those on more traditional schemes. It is important to clarify that in the context of this paper student performance considers the level and quality of learning outcomes as well as the student's grades in assessments.

Lieberman (2002) explains that in higher education student participation is a primary feature of enhanced performance and in distance learning courses students are more likely to participate in class discussions and group work than in traditional lectures, as they are given more time to prepare questions and responses. O'Connell (2002) argues that quieter students will still be excluded from virtual discussions, as there will always be students who will monopolize conversations, even online!

Also, controlling dominant students is far more difficult in eLearning environments when compared to face to face lectures (O'Connell 2002).

There is evidence to suggest that eLearning university students outperform those on traditional courses. Scott (2000) uses the example of Carnegie Mellon University (CMU) in America, where eLearning techniques have not only improved student exam results but have acted as educational bridges between subjects, breaking the ancient boundaries between disciplines. In addition, CMU students participate in eLearning initiatives that allow them to control their own company in a virtual working environment; students analyze competitor's business plans, track the performance of their company and even trade virtual stocks. Students, full time and part time, would not acquire this valuable experience in case studies and traditional lectures (Scott 2000). The inference is that higher education institutions which utilize effective eLearning methods not only enhance the performance of students in assessments but also produce graduates who are theoretically and practically prepared for working in an information age (Holley 2002).

Achievements of E-learning over the years

One of the most valuable attributes of eLearning techniques and delivery are that they potentially give students greater access to education, in comparison to more traditional less flexible educational methods. Writers such as Hemsley (2002) express the view that full time and part time students can now partake in their chosen degree courses from any location, giving people who travel or who are relocated, a transferable and easily accessible learning resource and experience. Through the use of advanced technology, students who have previously not had access to higher education now have the opportunity to study at the location that best suits their needs (Sadler-Smith 2000). ELearning offers people with disabilities the opportunity to further their education from home (Brown, Cromby and Staden 2001). Although the views expressed propose the positive aspects of home working, there

is still evidence to suggest that students who learn from their most convenient location will not engage in a positive learning experience.

The development of eLearning methods have brought with them the concept of ‘life long learning’. Although it is fair to say that lifelong learning is hardly a recent phenomena. John Henry ‘Cardinal’ Newman circa 1850, in an address made in the 17th Century (with apologies for the limited gender definition):

“….He (man) profits by an intellectual tradition, which is independent of particular teachers, which guides him in his choice of subjects. . . . He apprehends the great outlines of knowledge, the principles on which it rests, the scale of its parts. . . . Hence it is that his education is called "liberal." A habit of mind is formed which lasts through life, of which the attributes are freedom, equitableness, calmness, moderation, and wisdom….”

The notion that education finishes when someone enters the workplace or reaches a certain age is dispelled by the introduction of eLearning techniques and the provision of an opportunity to access teaching and learning resources remotely. Holley (2002), explains that the opportunities given by E-learning, such as the removal of time and location constraints, offer all people in society the potential to be life long learners whatever their location, age or occupation. In addition Serwatka (2002), argues that eLearning not only encourages ‘life long learning’ by alleviating physical constraints but also by removing some of the perceived barriers of higher education, enabling students to work towards their preferred course and goals at their own pace and ability. Whilst society’s enthusiasm for life long learning seems to be increasing, the question of which institution will deliver the learning seems to be unanswered. Shapiro (2000) suggests that the social demands for higher education are not always being met. Furthermore, when they are being met, it is not through the traditional university educational system. Does this suggest that the social requirements for ‘life long learning’ could

contribute the downfall of the traditional university? This opinion is supported by O'Hearn (2000), who outlines the requirement for alternative learning facilities that are not bounded by traditional academic structure but can offer the equivalent qualifications. In South Korea the government revised the Lifelong Education Law 1999, and allows private educational institutions to grant degree level qualifications (Jung 2000). The very survival of the traditional university may depend on how higher education institutions address the concept of 'life long learning'.

Global Education Services

The Internet has allowed universities to expand beyond their local campuses and create global learning institutions for today's information age (Wilson 2001). This globalised network of education services has resulted in enhanced domains of knowledge being available to students (O'Hearn 2000). Certainly, according to O'Hearn (2000), global eLearning programmes provide 'real time' connections between students who can share knowledge resources, such as databases libraries, from anywhere in the world. This may indicate that students who are studying on a global distance learning degree may be more prepared for a global work market.

This view is supported by Hemsley (2002), who studied Jones International University (JIU), which was the first university to be founded for the delivery of degrees on line. Hemsley (2002) stated that JIU have various degrees available all focused on the global expectation of today's work environment. Nonetheless, Jung (2000) argues that successful deployment of educational technology on a global scale will be problematical for universities, due to the lack of an IT culture within educational institutions. Shapiro (2000) argues that universities will struggle to implement global eLearning courses, as worldwide implementation is unequal in terms of infrastructure and technical support.

Students must utilise the IT tools efficiently to meet the academic demands of the course and this will increase the demands of both staff and students in eLearning environments, particularly when there are

problems with the networks (Shapiro 2000). As a final point, the University of California Los Angeles (UCLA) propose that the introduction of Global eLearning courses would prove unsuccessful from both an educational and financial perspective. Wilson (2001) reported that UCLA students and prospective students were reluctant to enroll on courses anywhere in the world instead they would pay more to attend lectures on a university campus.

O'Hearn (2000) maintains that access to less traditional educational providers is growing, and indeed, higher education is no longer restricted by fixed locations or inflexible academic structures (Hemsley 2002). The concept of 'life long learning' is now a reality with the introduction of eLearning into higher education, which gives people in any country access to university courses (Evans 2002). Brown, Cromby and Staden (2001) describe how eLearning has assisted in the education and rehabilitation of students with disabilities. Shapiro (2000) argues that the creation of a globalised education network may cause significant problems for traditional universities, not only on a technical level but also with regards to course format and support. Whilst technology makes it possible to deliver higher education globally, is it likely that traditional universities will continue to exist in such a flexible global market? (Hemsley 2002).

Challenges of E-learning

A research study on the "Problems of student's learning in college of Technology" with a case study of Government Technical College in Niger State. Its finding reveals that lack of maintenance culture with regards to Technological equipment has in no small measure affected students learning. The finding also revealed that lack of steady power supply.

In 2000, volery argues that the fast expansion of internet and related technological advancements, in conjunction with limited budgets and social demands for Volery (2003) argues that E- learning facilitate more effective education and offer significant advantages over

traditional teaching methods. This can be via full blown technological implementation or limited technology based environments such as bulletin boards, virtual lectures and E-libraries. Mc Cielland (2004) Contends that E-learning environment lecturers can offer constant educational support as students are able to communicate with classmates and lecturers, visit web sites and view course materials regardless of their time and location to maximize the potential of E-learning teaching tools.

Necessity of E-learning

Improved access to higher education has produced a substantial incentive for Universities to introduce E-learning courses. Volery continues that if colleges do not embrace E-learning technology that is readily available, they will be left behind in the pursuit for globalization. Ribiero (2002) argues that if colleges are to maximize the potential of E-learning as a means of delivering higher education, they must be fully aware of the critical success factors concerned with introducing online morels of education.

Benefits of E-learning

Many commentators described the relative benefits as the best way of impacting knowledge to students. According to Gurmak Singh, John O Dunoghue, Harve Worton in Journal of college teaching and learning in 2003. The impact of E-learning initiatives will have direct effects on the future structure of college on both strategic and tactical level (shaba 2000). Strategically, colleges will experience issues concerning face to face versus virtual environments, how many buildings to keep and not most importantly whether to maintain the existing organizational framework. On a tactical level, the changing role of lecturers, the

changeable learning environment and the design of E-learning facilities will all contribute to a potentially more flexible organizational structure.

Despite the apparent dysfunctional effects the implementation of distance learning techniques can assert on college structure, O, Hearn (2000) adds that the contemporary college structures must be changeable and adaptable, able to embrace new learning and communications techniques offered through E-learning, or face the consequence of limiting students direct access to global knowledge repositories that have the ability to extend higher education.

Volery (2006) identified that college students who participated in virtual lecturers found the experience rewarding and rated them as a valuable learning tool. However, nearly two third of the students in the class did not participate fully because of technical problems that is frustrations in trying to connect and utilize the network system.

It seems that the teaching tools associated with E-learning may have the potential to equip lecturers in higher education with flexible channels and a model for the delivery of courses. Web based learning allowed lecturers to disseminate up to date content in relatively no time at all and students can complete course just in time, giving them the opportunity to apply knowledge in contemporary situations.

Summary of the Literature review

Teare (2008) E-learning courses can be structured and aligned with the requirement of today's workforce. Also teaching method such as virtual teachers, sustain group interaction whilst broadening the flexibility of communication between students indicating that E-learning teaching method enhance student interaction and offer a flexible alternative to traditional time and place constraints (Holley 2009).

However, many authors debate E-learning programmes regarding the reliability of technology versus the apparent advantages of E-learning delivery methods. Similarly, Holley, (2011) suggests that even undergraduate students who are perhaps more assertive and motivated should be given focused training on how they can take full advantage of E-learning environments.

E-learning could have potentially major effects on the way higher education is designed, implemented and delivered. Until now, universities have been static in their structure and delivery of higher education courses. However, demand for learning has never been so high, and this in conjunction with the need to geographically broaden learning may prompt universities to introduce E-learning initiatives.

The same demands for learning and the increased revenue of independent educational providers, has produced a real threat to the very existence of the traditional university. ELearning may provide universities with a means of exceeding the newly formed competition, by taking full advantage of their traditional, already established reputations.

For students, eLearning can provide an educationally-superior alternative to traditional lectures, in which learning can take place outside the lecture hall. E-learning can also provide a model for students on how to become self directed independent learners, which may assist them to become 'life long learners'. For lecturers, networked learning may cause changes in work patterns and even change their professional role, but in addition, eLearning provides them with the opportunity to test students in real business situations and new methods to evaluate each student's learning. The role of the lecturer is predominant in the successful delivery of networked learning initiatives, as lecturers have the influence to eliminate students' technical frustrations, make students feel empowered and encourage students to interact with one another.

CHAPTER III

RESEARCH METHODOLOGY

This chapter describes the Research design, Area of study, Population of the study, Instrument for data collection, Validation of the instrument, Administration of the instrument, Method of data analysis and Decision rule.

Research Design

The research design used in carrying out this study was the survey research design where questionnaires were used to source for opinions of respondents on the issue. The survey research design was chosen as an appropriate method for the research as it seeks the view of people about a particular issue that concerns them, give room for research to study the group of people and items to source for information from the respondents.

Area of the Study

The study covered four Technical Colleges in Niger state. Which are Government Technical College, Minna; Government Technical College, Iyagi Bida; Government Technical College, Kontagora; Suleiman Barau Technical College, Suleja.

Population of the Study

The targeted population for this study was 125 respondents consisting of 25 technical teachers and 100 technical students' in the technical colleges Niger State. The entire population was used for the study.

Table 1:
Showing the relationship between Technical Colleges in Niger and the Number of Technical Colleges Teachers and Students

S/N	Technical College	Number of Technical Students	Number of Technical Teachers
1	Government Technical College, Minna	25	5
2	Suleiman Barau Technical College, Suleja	25	5
3	Government Technical College, Kontagora	30	6
4	Government Technical College, Iyagi Bida	20	9
	TOTAL	**100**	**25**

Instrument for Data Collection

The questionnaire was the main instrument used by the researcher for the data collected for the study. It consists of two sections as follows:

Section I: contain personal data's of the respondents

Section 2: contain three Research Question which are group as follows: Research Question 1 contains ten (10) items dealing with what the effects of E-learning on student's performance. Research Question II contains ten (10) items dealing with the possible challenges faced by E-learning. And Research Question III containing ten (10) items was developed to identify strategies needed to enhance effective learning through E- learning.

Validation of the Instrument

The instrument was validated by my supervisor and two other lecturers in the Department of Industrial and Technology Education, Federal University of Technology Minna. The validation suggestions were incorporated in the final draft of the instrument with appropriate

modification based on the suggestions and corrections. This was to ensure that the instrument was capable of eliciting necessary information for the data needed for the study

Administration of the Instruments

A total number of 125 questionnaires were administered by the researcher to the respondent in the four Technical colleges and 116 numbers were collected. I.e. 93% as showed in the table below.

Table 2:
Showing the relationship between Technical Colleges in Niger and the Number of questionnaire Issued and collected

S/N	Technical College	Numbers of Technical Students		Number of Technical Teachers	
		Issued / Collected		Issued / Collected	
1	Government Technical College, Minna	25	24	5	5
2	Government Technical College, Kontagora	25	24	5	5
3	Government Technical College, Bida	30	28	6	6
4	Suleiman Barau Technical College, Suleja	20	19	9	5
	TOTAL	**100**	**95**	**25**	**21**

Method of Data Analysis

The data collected was analyzed using mean, standard deviation and t-test. A four points rating scale was used to analyze the data collected for the study as shown below.

Strongly Agree (SA) = 4

Agree (A) = 3

Disagree (D) = 2

Strongly Disagree (SD) = 1

The formula used to calculate the mean

$X = \sum \underline{fx}$

$\underline{\sum f}$

$\sum$ = sum of normal value options

X = mean

f = frequency

Therefore the mean value $= \underline{4+ 3+2+}1$

4

$= 2.5$

Decision Rule

In order to determine the level of acceptance or rejection of any item, a mean score of 2.50 was used. Therefore any item with a mean response of 2.50 and above was accepted and any item with a mean response of 2.49 and below was rejected.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

This chapter deals with the presentation and analysis of data with respect to the research questions and hypothesis formulated for this study

Research question 1

What are the effects of E-learning in student's performance?

Table 3:
Mean response of teachers and students of technical college of Niger on effects of E-learning in student's performance

		$N_1 = 21$	$N_2 = 95$		
S/N	**ITEMS**	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_t$	**Remarks**
1	There a lot of independent learning	3.46	3.33	3.40	Agreed
2	There is more control over initiatives and their learning	3.23	3.08	3.16	Agreed
3	There is more flexibility in terms of when to study and where learning	3.31	3.42	3.44	Agreed
4	It increases independent skills	3.15	3.50	3.16	Agreed
5	It provides the learner with materials he is interested in	2.85	3.50	3.16	Agreed
6	It is the best tool for adult education	3.62	3.42	3.52	Agreed
7	It provides skill training for specific job	3.08	3.75	3.42	Agreed
8	It increases personnel productivity	3.46	3.17	3.32	Agreed
9	It provides for a greater organizational scope	3.77	3.67	3.72	Agreed
10	It increases technological skills	3.46	3.42	3.44	Agreed

Key: $\bar{X}_1$ = Mean score of Technical Teachers.

$\bar{X}_2$ = mean score of Technical Students.

$\bar{X}$t = average mean score of both Technical Teachers and Students.

N_1 = frequency/number of Technical Teachers.

N_2 = frequency/number of Technical Students.

Table 3 shows that the respondents agreed with all the items with average mean score 3.16 – 3.72 respectively. This revealed that if E-learning is effectively utilized it has great effect on student learning and achievement in Electrical and Electronic in Niger Technical colleges.

RESEARCH QUESTION 2

What are the possible challenges faced by the use of E-learning?

Table 4:
Mean response of teachers and students of technical college of Niger on the possible challenges faced by the use of e- learning.

		$N_1 = 21$		$N_2 = 95$	
S/N	**ITEMS**	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_t$	**Remarks**
1	It is expensive to manage	3.38	3.58	3.48	Agreed
2	It lacks an effective educational model	3.31	3.50	3.45	Agreed
3	It lacks capacity to manage change	3.38	3.25	3.44	Agreed
4	Without effective technology it is impossible to utilize	3.23	3.50	3.28	Agreed
5	Managerial problems	3.31	3.67	3.49	Agreed
6	Lack of sufficient hardware in most of our schools	3.15	3.58	3.42	Agreed
7	Inability of focus on developing on-line supply traditional content	3.46	3.50	3.48	Agreed
8	Some people are computer phobia	3.23	3.67	3.45	Agreed
9	There is lack of adequate physical contact between the instructor and the learner	3.31	3.58	3.45	Agreed
10	Technicality problems	3.31	3.17	3.24	Agreed

The data presented in table 4 revealed that there are lot of challenges militating against the use of e-learning which cause the ineffective use of E-learning by student which in turn reduce the student performance, learning and achievement in Electrical and Electronic in Niger Technical colleges.

RESEARCH QUESTION 3

What are the strategies that can enhance effective E-learning?

Table 5:
Mean response of teachers and students of technical college of Niger on the strategies that can enhance effective E-learning.

		$N_1 = 21$		$N_2 = 95$	
S/N	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_t$	Remarks
1	Provision of computers	3.69	3.23	3.47	Agreed
2	Teaching on how to operate computer	3.62	3.33	3.48	Agreed
3	Provision of Internet facilities	3.23	3.42	3.33	Agreed
4	Flexibility of the students Time-Table	3.15	3.50	3.33	Agreed
5	Availability of educational materials	3.54	3.58	3.56	Agreed
6	Making it a cost effective programme	3.31	3.75	3.53	Agreed
7	The availability of local/ software	3.22	3.25	3.24	Agreed
8	Competent teachers should be selected	3.46	3.50	3.48	Agreed
9	Motivating should be given to the student	3.15	3.58	3.42	Agreed
10	Age of different student should be considered	3.31	3.17	3.24	Agreed

Table 5 items revealed that the respondent agreed with all the items with the mean score ranging from 3.28 – 3.49. This revealed there are lot of strategies to improve the effective use of E-learning in order to catalyze the students learning and achievement in Electrical and Electronic in Niger Technical colleges

Hypotheses 1

HO_1: There is no significant difference between the mean responses of technical teachers and the students on the effects of E-learning in student's performance.

Table 6:

t-test Analysis of technical teachers and technical students on the effects of E-learning in student's performance

		$N_1 = 21$		$N_2 = 95$	
S/N	ITEMS	$S.D_1$	$S.D_2$	T	Remarks
1	There a lot of independent learning	0.51	0.64	0.59	NS
2	There is more control over initiatives and their learning	0.41	1.04	0.47	NS
3	There is more flexibility in terms of when to study and where learning	0.44	0.47	-0.61	NS
4	It increases independent skills	0.68	0.65	-4.38	S
5	It provides the learner with materials he is interested in	0.76	0.50	-1.27	NS
6	It is the best tool for adult education	0.46	0.47	1.00	NS
7	It provides skill training for specific job	0.80	0.44	-2.58	S
8	It increases personnel productivity	0.51	0.36	1.72	NS
9	It provides for a greater organizational scope	0.41	0.45	0.50	NS
10	It increases technological skills	0.80	0.44	-2.58	NS

KEY:
SD_1 = Standard Deviation of Technical Teachers
SD_2 = Standard Deviation of Technical Students
t-cal = t-test analysis of respondents
NS = Not Significant
S = Significant

Table 6 reveals that the t-test accept the null hypothesis of each items except items 4 and 7; at 0.05 level of significant, meaning that there is no significant different for all items accepted but there is significant different from items rejected in the mean rating of Technical teachers and students on the effects of E-learning in student's performance.

Hypotheses II

HO_2: There is no significant difference between the mean responses of technical teachers and the students on the strategies that can enhance effective E-learning.

Table 7:
t-test Analysis of technical teachers and technical students on the strategies that can enhance effective E-learning.

		$N_1 = 21$		$N_2 = 95$	
S/N	**ITEMS**	**$S.D_1$**	**$S.D_2$**	**T**	**Remarks**
1	Provision of computers	1.12	0.49	-0.29	NS
2	Teaching on how to operate computer	0.46	0.51	0.20	NS
3	Provision of Internet facilities	0.59	1.24	0.98	NS
4	Flexibility of the students Time-Table	0.60	0.50	-1.91	NS
5	Availability of educational materials	1.13	0.45	-1.69	NS
6	Making it a cost effective programme	0.32	0.51	1.59	NS
7	The availability of local/ software	0.41	0.51	1.59	NS
8	Competent teachers should be selected	0.46	0.47	1.00	NS
9	Motivating should be given to the student	1.06	1.26	-0.04	NS
10	Age of different student should be considered	0.82	0.44	-2.00	S

Table 7 reveals that the t-test accept the null hypothesis of each items except items 10; at 0.05 level of significant, meaning that there is no significant different for all items accepted but there is

significant different from items rejected in the mean rating of Technical teachers and students on the strategies that can enhance effective E-learning.

Findings

This section present the summary of findings of the study based on the data collected and analyzed for the research questions and the hypotheses which served as the frame work for the study.

1. Findings related to the effects of E-learning on student's performance.
    - There a lot of independent learning
    - There is more control over initiatives and their learning
    - It increases independent skills
    - It provides the learner with materials he is interested in
    - It is the best tool for adult education
    - It provides skill training for specific job
    - It increases personnel productivity
    - It provides for a greater organizational scope
    - It increases technological skills
2. Findings on the possible challenges faced by the use of e- learning
    - It is expensive to manage
    - it lacks an effective educational model
    - It lacks capacity to manage change
    - Without effective technology it is impossible to utilize
    - Managerial problems

- Lack of sufficient hardware in most of our schools
- Inability of focus on developing on-line supply traditional content
- Some people are computer phobia
- There is lack of adequate physical contact between the instructor and the learner
- Technicality problems

3. Findings on the strategies needed to enhance effective learning through E-learning
    - Provision of computers
    - Teaching on how to operate computer
    - Provision of Internet facilities
    - Flexibility of the students Time-Table
    - Availability of educational materials
    - Making it a cost effective programme
    - The availability of local/ software
    - Competent teachers should be selected
    - Motivating should be given to the student
    - Age of different student should be considered

Discussion of findings

The purpose of the study is to identify the effect of E-learning for effective learning and achievement of Electrical and Electronic Student in Niger State Technical Colleges. The process involves determination of the effects of E-learning on student's performance, the possible challenges faced by E-learning and the strategies needed to enhance effective learning through E- learning in order to effectively achieve the purpose of the study. Therefore three research

question and two null hypotheses were formulated which led to the findings stated above. These findings are hereby discussed according to the research questions.

On the effects of E-learning in student's performance, it was revealed in table 1 that, both teachers and students agreed with all items. Which shows that if student's use effective E-learning it will improve their learning, achievement and performance. These table therefore showed that the students of Electrical and Electronic in Niger State Technical Colleges will drastically improve adult education because most adult are engage with day to day activities in other to make living which make it difficult for them to learn, but with the help of e-learning they can convenient learn without affecting their day-to-day work. If e-learning is well used it will facilitate easy learning because student are well equipt with internet so if all they needed is on the internet it will help to improve their learning and it will make them independent of classroom learning which will in turn have great impact on their standard of leaving because education is said to be the stepping stone of every developing nation.

In table 2 it was revealed that there are numerous challenges militating against the use of e-learning, which in turn reduce the learning and achievement of students. Among the factor is that, it is expensive to manage due to the high capital requirement for the facilitation of E-learning because most material or equipment use for e-learning is expensive and is not locally made, which discourage the school or people to use it. Secondly it requires high maintenance due to the nature of its component it's been made. Another major challenge militating against the use of e-learning is that most teacher or instructors are illiterate to the use of computer and internet which make it difficult for e-learning. the greatest challenge was been noted by Ashonstev (2012), which he said that the government has been the main root of E-learning problem in Nigeria, he typified that Government have pay low attention to the use and facilitation of

effective E-learning system in the country by paying low attention on the effective implementation E-learning through ineffective founding, among others.

It was revealed in table 3 that before E-learning can be effective, there must be improvement in the aspect of government by making sure that all facilities needed to effectively implement E-learning is provided through provision of funds, setting committee to oversee that e-learning is effectively implemented in technical colleges, reduction of internet cost fee for student in order to motivate the student to use e-learning. In pursuing this goal of effective e-learning in technical colleges the colleges also have to pay a higher role, among this role are: Provision of Internet facilities and computer, training and retraining of teachers because they are the one to put the necessary information on the internet. If these entire highlight factors are being met it will help to effectively catalyze the use of E-learning which will in turn aid learning and achievement of Electrical and Electronic student in Niger Technical Colleges.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter deals with the summary of the study, educational implication of the study as revealed by the findings, conclusions and the recommendation based on the findings

Summary of the study

In the quest of achieving the modern way of learning in technical colleges, educationist suggested different ways of giving instruction to the students among the ways suggested is the

electronic way of learning, the effects of E-learning in student's performance has posed a great level of achievement in the electrical and electronic course which permit independent learning for student of different social background which increases personnel productivity. Despite the vast progress of E- learning is, it has some set back which serve as a treat to the performance of the student among which are: expensive to manage, without effective technology it is impossible to utilize, some people are computer phobia.

The reviews of some related literatures were reviewed under the following sub-headings; Historical background of E-learning, Effects of Technology on Education, E-learning as in Enhanced Teaching Tools, the Achievements of E-learning and Challenges of E-learning. Where E-learning means all the activities through the internet that facilitate simultaneous interaction between learners and instructors. The term E-learning takes it root from the digital age in the 90's, when the various form of "ES", such as E-commerce. E-business, E-shopping and other terms beginning with letter "e" (to refer to the electronic worlds) were introduced to the internet. In short E-learning is the new delivering system of old training programs, though the use of the internet rather than CDs. It is compressive, fast, efficient, and effective training solution that combines excellent information management with the best technology.

Questionnaire method was used to collect data from the sample of study which constitute of three (3) research questions having 30 items in all. The questionnaire was validated by the researcher supervisor and two (2) other lecturers in the department of electrical and electronic industry of the Federal University of Technology, Minna. However the data use for the findings were being collected from four (4) technical colleges in Niger State. The targeted respondents were the teachers and student of the technical colleges.

The analysis of the data were presented using tables, were the mean and the standard deviation were showed. Some findings gotten from this study are; the increases independent skills, There a lot of independent learning, It is the best tool for adult education, It is expensive to manage, Without effective technology it is impossible to utilize, Lack of sufficient hardware in most of our schools, Provision of computers, Provision of Internet facilities and Availability of educational materials among others. And a few were been discussed.

Implication of the study

The findings of this study have implications in the improvement needs of the performance of electrical and electronics student in technical colleges.

The finding of the study show that e- learning influence students positively among which are: enhancing independent learning, it increases independent skills, It provides the learner with materials he is interested in, it provides skill training for specific job, It increases personnel productivity, It increases technological skills

Another finding of the study suggests the possible challenges faced by the use of e-learning such as: it is expensive to manage, it lacks an effective educational model, Lack of sufficient hardware in most of our schools, and some people are computer phobia, Inability of focus on developing on-line supply traditional content. All these must be taking care of for effective achievement of the objectives of e -learning in our technical colleges.

Findings also shows that the strategies needed to enhance effective learning through E-learning in technical colleges among which are: Provision of computers, Provision of Internet facilities are being put in order, making it a cost effective programme, the availability of local/

software, are being put in other, we shall have competent skilled students in the area of e - learning to meet with the modern standard of delivery instruction.

Conclusion

Based on the study, it was analyzed that there is need for E-learning on the student achievement in electrical and electronic engineering in technical colleges of Niger state. Since E-learning is a method of learning through electronic means. The result of this study will provide the software developers of the e- learning of the technical colleges on what is needed to be included to meet up with the curriculum of electrical and electronics.

The problem being faced by E-learning are that, expensive to manage, managerial problems, some people are computer phobia and in most schools there are issue of insufficient hardware in most of our schools.

Recommendation

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

1) The Government and the institution should provide adequate computer in order to enhance the electronic learning.
2) Electrical and electronic teachers should undergo in-service training in other to acquire the knowledge of handling e- learning material.
3) Effort should be made in motivating the students order for them to develop interest in e- learning

4) Adequate effort should be made to ensure that the educational material is cost effective

Suggestion for further Research

The following of the suggestion were made for further research

1) Strategies to enhance effective learning through E-learning in technical colleges
2) Ways of achieving the needs in the use of E-learning to ensure better performance of students.

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APPENDIX I

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF INDUSTRAL AND TECHNOLOGY EDUCATION

ELECTRICAL AND ELECTRONICS TECHNOLOGY OPTION

QUEISTIONAIRE ON:

THE EFFECT OF E-LEARNING ON STUDENTS LEARNING AND ACHIEVEMENT IN ELECTRICAL/ELECTRONICS IN TECHNICAL COLLEGES IN NIGER STATE

SECTION A

PERSONNAL DATA

Please kindly provide the information required below. All information and responses supplied to the items of this questionnaire will be used for the purpose of this research work and will be treated as confidential. Your prompt and honest response will be duly appreciated.

Respondent: Teacher ☐

Students ☐

SECTION B

QUESTIONAIRES

Please indicate the option that appeal to you by ticking the appropriate box.

Key to response options SA = Strongly Agreed

A = Agreed

D = Disagreed

SD = Strongly Disagree

RESEARCH QUESTION I

What are the effects of E-learning in student's learning?

S/N	ITEMS	SA	A	D	SD
1	There a lot of independent learning				
2	There is more control over initiatives and their learning				
3	There is more flexibility in terms of when to study and where learning				
4	It increases independent skills				
5	It provides the learner with materials he is interested in				
6	It is the best tool for adult education				
7	It provides skill training for specific job				

8	It increases personnel productivity				
9	It provides for a greater organizational scope				
10	It increases technological skills				

RESEARCH QUESTION 2

What are the possible challenges faced by the use of E-learning?

S/N	ITEMS	SA	A	D	SD
1	It is expensive to manage				
2	It lacks an effective educational model				
3	It lacks capacity to manage change				
4	Without effective technology it is impossible to utilize				
5	Managerial problems				
6	Lack of sufficient hardware in most of our schools				
7	Inability of focus on developing on-line supply traditional content				

8	Some people are computer phobia				
9	There is lack of adequate physical contact between the instructor and the learner				
10	Technicality problems				

RESEARCH QUESTION 3

What are the strategies needed to enhance effective learning through E-learning?

S/N	**ITEMS**	**SA**	**A**	**D**	**SD**
1	Provision of computers				
2	Teaching on how to operate computer				
3	Provision of Internet facilities				
4	Flexibility of the students Time-Table				
5	Availability of educational materials				
6	Making it a cost effective programme				
7	The availability of local/ software				
8	Competent teachers should be selected				

9	Motivating should be given to the student				
10	Age of different student should be considered				

APPENDIX II

FORMULA USED FOR DATA ANALYSIS

Mean($\bar{X}$)

$$\bar{X} = \sum \frac{fx}{n}$$

Where $\bar{X}$ = mean response of each item

F = frequency of respondents

$\sum$ = sum of

X = Rating scale/Nominal value of options

N = total number of respondents

Standard deviation

$S.D = \sqrt{\sum f(X - \bar{X})^2 / N}$

Where: N = Total respondents sum

F = frequency

$\bar{X}$ = scores squad

X = Nominal value of options

S.D = Standard deviation

$\sum$ = sum of