Computer-aided Instruction and Institutional Effectiveness of Federal Polytechnic in North Central Nigeria

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Abstract

The study investigated the relationship between computer aided instruction and institutional effectiveness of Federal Polytechnics in the North Central Geo-Political Zone. Correlation design was adopted for the study. Stratified random sampling technique was used to select 1000 respondents comprising of Heads of Departments, Examination officers, library and Information Technology officers, Chief Lecturers, Students and Executives of Student Union Governments. The research instruments used for the study were Questionnaires; Computer Aided Instruction Questionnaire (CAIQ) and Institutional Effectiveness Questionnaire (IEQ). The instruments were validated by the experts of computer science and science education. Split-half reliability method was used to determine reliability index of 0.62 and 0.64 for CAIQ and IEQ respectively after subjecting to Spearman ranking order statistics at 0.05 significance level. Three research questions and four hypotheses were generated to guide the study. Descriptive statistics was used to answer the research questions while Pearson product moment was used to test all the hypotheses. The result shows that there is low significant relationship between computer aided instruction and institutional effectiveness of Federal Polytechnics in North Central Nigeria. It was however recommended that adequate computer accessories should be provided for effective teaching and learning processes in the polytechnic. Also, adequate computer and utilization training should be given to all lecturers in order to develop computer based instruction for the effectiveness of the instruction in North Central Nigeria.

Keywords: Computer Aided Instruction, Institutional Effectiveness, Federal Polytechnic and North Central Nigeria.

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Introduction

Education is an essential tool for national transformation and national development. Educational sectors have been ranked high among other sector in Nigeria, the Federal Republic of Nigeria (2009) wants quality assurance and control in the education of her citizens. Ogundele (2008) noted that huge amount of funds are gulp into Nigeria education for the provision of adequate infrastructural facilities, teaching materials, recreational facilities, welfare services, quality teachers etc.

It should be noted therefore, that polytechnics are purposely established to produce effective middle manpower needed for national economy.For the federal polytechnics to be effective, there is the need for the institutional lecturers to make research community services and effective teaching.

Olaifa (2011) noted that for the lecturers to be effective there is a need for effective students' academic performance and quality assurance in their products. Olaifa however called for computer aided instruction such as computer programming, computer based e-learning programme, pedagogical approach, computer appreciation, computer assisted instruction, mobile phones and internet services.

Etejere and Ogundele (2008) defined computer aided instruction as the pedagogical approach that is complemented with adequate use of computer programming during the teaching and learning process in the schools. The authors however defined computer aided instruction as the process of teaching learning process whereby the teachers' make use of computer aids for the teaching in the schools The result was supported by Ajayi (2014) who cited examples of mobile teaching, online based education andused computer instruction forteaching.

Computer aided instructions are advocated by the three tiers of government and the international communities to be used during the teaching- learning process, for examinations, records, teaching, communicating, informing, social networking etc. in the various school system including private, state and federal polytechnics in Nigeria. The issue is that whether the institutions will be effective in their job performance, research publications, record keeping and community services using all the available aids. Therefore, the rationale for this study is to examine the availability of all the computer facilities, the utilization for the teaching-learning processes and their impacts in

enhancing institutional effectiveness of federal polytechnic in the North Central Nigeria.

Statement of Problem

Over the recent years computer usage had become the order of the day in the performance of duties including business transactions and teaching learning process. However, according to Raphat (2006), the students remember easily what they see and practice and forget easily what they hear. The author however described computer as an aid to effective teaching and learning of instructions. The problems that this study investigated are: the available types of computer for instructional strategies, in federal polytechnics in north central Nigeria, the utilization of the computer for effective instruction in the polytechnics, the impacts of those computer accessories and facilities usage for instruction on the institutional effectiveness of federal polytechnics, the indicators of institutional effectiveness of federal polytechnics in Nigeria and the levels of teachers computer literacy for computer aided instructions.

Purpose of the Study

The study investigated the relationship between computer aided instruction and institutional effectiveness of federal polytechnics in North Central Nigeria. Specifically the study aimed to:
-       find out the availability of computer facilities that may enable effective instruction.
-       examine the level of utilization of the available computer.
-       investigate the adequacy of those computer facilities.
-       examine the level of lecturer's computer literacy.
-       examine the indicators of institutional effectiveness of federal polytechnics.
-       find out the major problems that arise due to computer aided instruction.

Research Questions

The following research questions were posed for the study.
RQ$_1$: What isthe available computer aided instruction used in federal polytechnics in north central Nigeria?
RQ$_2$: Are the lecturers really making use of the computer aided instruction for enhancing students' academic performance?

RQ_3: Are the computer influencing institutional effectiveness of federal polytechnics in North Central Nigeria?

Research Hypotheses

The following hypotheses were formulated to guide the study:
H_{01}: There is no significant relationship between computer aided instruction and institution effectiveness of federal polytechnics in North Central Nigeria.
H_{02}: There is no significant relationship between computer-based test and students' academic performance of federal polytechnic in north Central Nigeria.
H_{03}: There is no significant relationship between computer-aided instruction and lecturers' research publications' at federal polytechnics in North Central Nigeria.
H_{04}: There is no significant relationship between computer-aided instruction and lecturers' job performance at federal polytechnics in North Central Nigeria.

Methodology

The research design adopted for the study was descriptive survey of correlation type. Descriptive survey research designs were adopted because the study examined the available and usage of computer aided instructions and correlate them to extend to which the usage of computer aided instruction influence institutional effectiveness. The study examined the relationship that existed between computer aided instruction and institutional effectiveness of federal polytechnics in north central Nigeria. The dependent variable is institutional effectiveness while computer aided instruction is the independent variable. The variables examined for computer assisted instruction are computer based test while institutional effectiveness variables are lecturer research publications, lecturers' job performance and students' academic performance. Stratified random sampling technique was used to sample 1000 respondents comprising of heads of department, examination officers library and information services, chief lecturer secretary directors of academic planning units, student affairs, students' executive and class representative. Stratified random sampling technique was used because the selection was made from each of the states in the northern Nigerian. Awotunde (2004) defined stratified sampling as selection

based on strata.The sample was selected from five out of eight Federal Polytechnics in the North Central Nigeria.

Instrumentation

The instrument used for the data collection was computer aided instruction and institutional effectiveness questionnaire (CAIIEQ). The instrument was self-designed by the researcher. It contained 20 items which was prepared in line with the modified 4-ratingLikert scale Strongly Agreed, Agreed, Disagreed and Strongly Disagreed. The instrument was validated by the experts of computer education and educational administration. Test-retest reliability method was used to test reliability index of the instrument (CAIIEQ). The result of 0.64 showed that the instruments was reliable for use after subjected to spearman ranking order statistical analysis at 0.05 significance level. All the data collected were subjected to Statistical Package for Social Sciences (SPSS) in computer centers. Mean scores were used to answer all the research questions while Person Product moment correlation statistics was used to test all the research hypotheses at 0.05 significance level.

Result

H_{01}: There is no significant relationship between computer-aided instruction and institutional effectiveness of Federal Polytechnics of North Central Nigeria.

Table 1
Computer-aided instruction and institution effectiveness of federal polytechnics in north central Nigeria

Variable	No	$\overline{x}$	SD	df	Calculated r-value	Critical r-value	Decision
Computer aided instruction	1000	52.62	22.13				
Institutional effectiveness	1000	60.10	15.28	999	.38	.195	H_{01}rejected

Table 1 shows that the calculated –r-value of 0.38 is greater than the critical r-value of 0.195 at the degree of freedom of 0.195 and tested at 0.05 significance level. It indicates that the null hypothesis which

stated that there is no significant relationship between computer-aided instruction and institutional effectiveness of federal polytechnics in north central Nigeria is however rejected.

H_{02}: There is no significant relationship between Computer Based Test (CBT) and students' academic performance of federal polytechnics in north central Nigeria.

Table 2

Computer Based Test (CBT) and Students' Academic Performance of Federal Polytechnic in North Central Nigeria

Variable	No	$\overline{x}$	SD	df	Calculated r-value	Critical r-value	Decision
Computer Based Test (CBT)	1000	42.12	22.46				
				999	.48	.195	H_{o2} rejected
Students Academic Performance	1000	14.63	17.28				

Table 2 shows that the calculated r-value of 0.48 is greater than the critical r-value of 0.195 at the degree of freedom of 99 and tested at 0.05 significance level. Hence the null hypothesis which stated that there is no significant relationship between computer-based test and academic performance of students is rejected.

H_{03}: There is no significant relationship between computer-aided instruction and lecturers'research publications at federal polytechnics of Northern Central Nigeria.

Table 3

Computer Aided Instruction and Lecturers Research Publication at Federal Polytechnics in North Central Nigeria

Variable	No	$\overline{x}$	SD	df	Calculated r-value	Critical r-value	Decision
Computer Aided Instruction	1000	52.6	22.13				
				999	.56	.195	H_{03}rejected
Research Publications	1000	46.36	18.41				

Table 3 shows that eth calculated r-value of 0.56 is greater than the critical r-value of 0.195 at the degree of freedom of 999 and tested at 0.05 significance level. Hence, the null hypothesis which stated that there is no significant relation between computer aided instruction have moderate significant relationship with the lecturers' research publications.

H_{04}: There is no significant relationship between computer aided instructions and lecturers' job performance at Federal Polytechnics in North Central Nigeria.

Table 4

Computer aided Instructions and Lecturers' Job Performance of Federal Polytechnic in North Central Nigeria

Variable	No	$\overline{x}$	SD	df	Calculated r-value	Critical r-value	Decision
Computer Aided Instruction	1000	52.62	22.13				
				999	.56	.195	H_{04}rejected
Lecturer's Job Performance	1000	46.36	24.84				

Table 4 shows that the calculated r-value of 0.61 is greater than the critical r-value of 0.195 at the degree of freedom of 999 and tested at 0.05 significance level. Hence, the null hypothesis which stated that there is no significant relationship between computer aided instructions is however rejected. It indicated that the availability of computer aided instruction such as programme instructions, computer assisted programme, computer based test, e-examination, e-payment, computer compact television and mobile phone had positive significant impacts on the lecturers' job performance in the Federal Polytechnics of North Central Nigeria. The result was supported by Mwachukuwu (2014) that the use of computer had significant impact in the lecturers' productivity in the tertiary institutions.

Conclusion

Based on the analysis made, the result showed that computer aided instructions availability in the federal polytechnics are very low. But the few available ones like computer based test, mobile phone, ipads e-payment, e-examination are judiciously utilized which encouraged instructional effectiveness indicators like students' academic performance, lecturers' job performance andlecturers' research publications in the various institutions of Federal Polytechnics. It could however be concluded that the use of computer aided instruction have significant impacts on the institutional effectiveness of Federal Polytechnics especially in North Central Nigeria.

Recommendations

In accordance to the analysis and conclusion made, the following recommendations are proffered.

Establishment of computer based centres in the federal polytechnics in north central Nigeria: The philanthropist government and non-governmental agencies, banks and stakeholders should come to the aid of the federal polytechnics in the provision of computer equipment that are useful for the teaching learning process in the institutions.

Adequate computer training should be provided for both the lectures and students to acquaintthem with the need for computer literacy and appreciation in the federal polytechnics in north central Nigeria.

Finally, the institution should always instill in the students' mind on how to use the available social media and networks such as Google, Face book twitter, LinkedIn, wifi etc. as a means for effecting positive performance academically and to identify behaviours in the society such as fraud, prostitutions etc.

Discussion

The result shows that there is low positive significant relationship between computer aided instruction and the instructional effectiveness especially in the administration, teaching and research especially in federal polytechnics in North Central Nigeria. The result is therefore supported by Abegunde (2010) who stated that the Nigerian institutions had no value orientation to develop computer aided instruction in the

institutions due to their low computer appreciation, literacy and application.Most of the federal polytechnics in the North central still adhere to the manual and traditional mode of instruction which they are used to in the past (Oladipo, 2009).

It means that there is a positive significant relationship. The result is in accordance with the opinion of Etejere and Ogundele (2012) who stated that few institutions had been adopting Computer Based Testyet, their influence on the students' academic performance had not been positive. The authors noted that many students complained of failure due to the conduct of the Computer Based Test and low computer literacy and application by the students and lecturers.

The lecturer of Federal Polytechnics of North Central Nigeria made use of few available computer aids like laptops, mobile phones iPod's, tablets, modems etc to browse and connect to submit and download different papers and pay their publication fees online. The use of computers had aided lecturer in their areas of research publications. The result was supported by Akinnubi (2012) who opined that the use of internet facilities, social networking had aided the lecturer in their research publications in greater ways and called for further improvement of the ICT usage in the school system.

References

Abegundet, Z.A (2010). Computer aided instruction and internal efficiency of secondary schools in Oyo state, Nigeria. Unpublished M.Ed Project at University of Ibadan.

Ajayi, A.T (2004). Computer Education for Nigerian schools. Lagos: Romichas Press.

Akinnubi, P.O. (2012). Integrating information and communication technology to Nigeria education. A paper presented at the international conference of African teacher's forum held at Benin Republic on 25-29th May 2012.

Awotunde, S.D. (2004). Research methods in education. Jos: Fatteco press.

Etejere, P.A.O &Ogundele, M.O.(2012). COMPUTER Literacy skills and administrative effectiveness of secondary schools in Kwara State, Nigeria. *Africa Journal of Teacher Education* 2(3)13-18.

Federal Republic of Nigeria (2009). National Policy of Nigeria. Abuja: NERDC

Nwachukuwa (2014). Essential points in computer education. Owerri: Jubille press.

Ogundele, M.O. &Etejere, P.A.O (2012). Computer literacy and administrative effectiveness of secondary schools in Kwara State Nigeria. *African Journal of Teacher Education 1*(2)15.

Ogundele, M.O. (2008). Funding teacher job satisfaction and students' academic performance of private secondary schools in Kwara State unpublished Ph.D Thesis, University of Ilorin.

Oladipo, S.A. (2009).Computer aided instruction and secondary schools project management in adult education. *Journal of Art Education* 5 (2) 32-38.

Olaifa, B.A (2011). Computer aided instruction and student academic performance of secondary schools in Kwara State unpublished project National Teachers Institute Kaduna.

Raphat, J.A. (2006). Social media usage in education: Problem and prospects. London: Ukraine press