Comparative Study of Computer Assisted Instruction and Traditional Methods of Teaching Keyboarding Among Polytechnic Students in Nigeria

Lanre Akewusola [1] Olayinka Taiye Oyinlove[2] James Kehinde Ayeni [3] Joshua Sule Mamman[4]

Abstract

The study was carried out to compare Computer Assisted Instruction and Traditional Methods of Teaching Keyboarding among Polytechnic Students in South West Geo-Political Zone, Nigeria. In order to achieve this, one specific objectives were raised In line with the specific objectives, four research questions and hypotheses were formulated for the study. Experimental design specifically pretest posttest control group design was adopted for the study. The population for the study comprised of nine hundred and eighty students (980) from ten Polytechnics. Out of these, six Polytechnics used for the study were purposively selected from ten Polytechnics in South West Geo-Political zone, Nigeria. Thirty (30) students from each of the six (6) Polytechnics made up of the sample size of one hundred and eighty students (180) who were selected for the study through random sampling. The instrument used for data collection was Keyboarding Speed and Accuracy Test (KSAT), which was duly validated with split half reliability coefficient of 0.81. The data collected were statistically analyzed using mean and standard deviation for the research question. The null hypothesis was tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance. The findings include among others that, the computer assisted instruction group were better in keyboarding speed and accuracy than the traditional method group because of the The study was carried out to compare Computer Assisted Instruction and Traditional Methods of Teaching Keyboarding among Polytechnic Students in South West Geo-Political Zone, Nigeria. In order to achieve this, one specific objectives were raised In line with the specific objectives, four research questions and hypotheses were formulated for the study. Experimental design specifically pretest posttest control group design was adopted for the study. The population for the study comprised of nine hundred and eighty students (980) from ten Polytechnics. Out of these, six Polytechnics used for the study were purposively selected from ten Polytechnics in South West Geo-Political zone, Nigeria. Thirty (30) students from each of the six (6) Polytechnics made up of the sample size of one hundred and eighty students (180) who were selected for the study through random sampling. The instrument used for data collection was Keyboarding Speed and Accuracy Test (KSAT), which was duly validated with split half reliability coefficient of 0.81. The data

[1] Department of Office Technology and Management, Institute of Information and Communication Technology, Kwara State Polytechnic, Ilorin. Kwara State, Nigeria

[2] Department of Office Technology and Management, Institute of Information and Communication Technology, Kwara State Polytechnic, Ilorin. Kwara State, Nigeria

[3] Department of Computer Science, Institute of Information and Communication Technology, Kwara State Polytechnic, Ilorin.

[4] Department of Business and Entrepreneurship Education, Kwara State University, Malete P.M.B 1530, Ilorin, Kwara State, Nigeria Joshua.mamman@kwasu.edu.ng

collected were statistically analyzed using mean and standard deviation for the research question. The null hypothesis was tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance. The findings include among others that, the computer assisted instruction group were better in keyboarding speed and accuracy than the traditional method group because of the significant difference found between the speed and accuracy mean scores of students taught using computer assisted instruction and those taught using traditional methods. It was concluded that computer assisted instruction is the better method of teaching keyboarding. Based on the findings and conclusion, it was recommended among others that; Keyboarding teachers should use computer assisted instruction method in teaching speed and accuracy in keyboarding and that Polytechnic Management should also provide necessary facilities such as computers and software that will facilitate effective teaching and learning of keyboarding skills using Computer Assisted Instruction.

Keywords

Computer, Assisted, Instruction, Traditional, Methods, Keyboarding

1. Introduction

The introduction of computer-based courses to the curriculum of secretarial profession in Polytechnics as reviewed by the National Board for Technical Education (NBTE) 2004 brought about fast understanding and qualities in learning of secretarial students. In this era of technology, computer is a key element in Information and Communication Technology. Computer has been referred to as a device that has turned the whole world into a global village. With Information and Communication Technology (ICT) information can be transferred faster and easier. Computer has become a major component of ICT which has a lot of advantages in this modern technological era.

Adeleke (2003) stated that computer literacy involves a set of abilities requiring individuals to communicate effectively with the computer system and as a basis for lifelong learning. It is common and relevant to all disciplines, learning environments and all level of education. This was upheld by Ige (2002), who asserted that with the rate of growth of computer development, every aspect of man's life would be on the computer. He went further that, whoever neglects the study and use of computer today does so at his own detriment. No wonder in the past only people that cannot neither read nor write were an illiterate but in this era of technological advancement, whoever that cannot operate a computer would also be seen as an illiterate person.

Computer appears to be the best audio-visual material that has ever been devised. It is such a comprehensive device that allows for the use of about 60% of our sense organs. These organs are those of sight, touch and hearing. These are the organs that are useful for most effective learning. Aroloye (1985) in Oyedele (2005) established that, 75% of learning occurs through seeing, 13% through hearing and 6% through feeling or touching. Only 3% of learning takes place through smelling. The application of computer especially in teaching and learning is limitless that is, there is almost nothing about teaching and learning or instructional aids that cannot be computerized. Therefore, the use of Computer Assisted Instruction for the teaching and learning of Keyboarding in Polytechnics will bring about effectiveness in terms of speed, accuracy, prompt feedback, self-

assessment, learning autonomy and enhance academic performance in teaching and learning of keyboarding as a subject by secretarial students.

Computer Assisted Instruction is an instructional technology which can be designed for a course and used for teaching and learning both within and outside the classroom setting. Computer Assisted Instruction, also known as CAI is a teaching process in which a computer is used to enhance the education of an individual. Instructional or CAI software that teaches specific skills and knowledge, often narrowed to a specific content area and grade range. Computer Assisted Instruction can be used to describe internet-based instruction using WebPages, web bulletins boards, newsgroups, video and real audio. It can also be the use of computer technology in teaching and learning. Computer Assisted Instruction will simplify the teaching and learning of keyboarding and enhance students understanding. It will make students to learn and acquire the basic techniques and skills of keyboarding in an interactive way. It will bring the teaching and learning of keyboarding to the level of the student understanding through technology. Students will have an opportunity to repeat a drill and practice repeatedly for proper mastery of techniques or skills.

Computer programs are interactive and can illustrate a concept through attractive animation, sound and demonstration. They allow students to progress at their own pace and work individually or problem solve in a group. Computers provide immediate feedback, letting students know whether their answer is correct or wrong. If the answer is not correct, the program shows students how to correctly answer the question. Computer Assisted Instruction attracts the students' attention because the programs are interactive and engage the students' spirit of competitiveness to increase their scores. It is also moving at the students' pace and usually does not move ahead until they have mastered the skill. Keyboarding is an art that enables an individual to acquire skills which involves pressing on keyboard with the fingers through the mastery of the keys to produce varieties of documents on the typewriter or computer. Each hand made its assignment of fingers to keys. Frank Guerin (1878) in Abraham and Okonkwo (2011) came up with touch typewriting method which is widely used today, which involved the use of all eight fingers to type without looking at the keys. The real key to keyboarding is techniques, and the theory for this pedagogy is in the realm of teachers and methods used to teach the subject. Keyboarding is an important psychomotor skill that all students need to learn, the art of keyboarding is a matter of training fingers to respond correctly and quickly to press the correct key, and one must continue to practice this art until it become effective and a skill. The objectives for new students are to develop an ability to use the correct techniques, be able to key data quickly, accurately and demonstrate operational skills in using the computer.

In line with this, Polytechnics are one of the higher institutions in Nigeria which are saddled with the responsibilities of training both low and medium level manpower in varieties of occupation or profession. The products of these institutions are expected to have acquired necessary skills and competences that can make them fit properly into the society or world of work after graduation. Therefore, for Polytechnics to achieve these there must be a concerted effort to move from traditional method of teaching to modern, motivating and interesting method such as CAI especially in this era of technological advancement.

Office Technology and Management departments are the departments where keyboarding is being taught in Polytechnics. Using modern techniques to teach keyboarding will boost the interest of

learners, increase their speed and accuracy, and drastically reduce failure rates and the number of drop-outs.

In view of the above, the traditional methods of teaching and learning such as demonstration, lecture method and others are becoming inadequate as approaches towards functional education. Traditional method of teaching as meant in this paper is the method of teaching that is being used in teaching a course. 'Traditional' means what has been on ground, what they are used to. 'Their tradition'. In this paper the course is keyboarding which is practical in nature, the students go to the laboratory where the teacher shows them how to use the keyboard. The teacher explains how to place fingers on the keyboard and gives them exercises from the textbook for them to work on. The adverse situations in which teaching and learning take place make the traditional methods ineffective. To make teaching and learning effective in this knowledge-based economy, Punie, Zinnbaver and Cabrera (2006) opined that, part of the solution is to provide better technology support for learning environment.

The use of Computer Assisted Instruction for effective classroom teaching and learning has for a long time been introduced in the developed countries to improve the efficiency and effectiveness of education at all level. The role of Computer Assisted Instruction in teaching and learning of keyboarding is to teach keyboarding in a creative way and serve as a complement to the old or traditional method in Polytechnics. Traditional method therefore could be regarded as the hitherto existing methods of instruction in the normal classroom setting. Among the conventional methods of instruction in the teaching and learning of keyboarding is the lecture method. Lecture method allows a great deal of information to be passed to the learner and favours handling of large classes. Despite this advantage, the lecture method does not stimulate students' innovation, inquiry and scientific attitudes. It encourages students to cram facts which are easily forgotten (Okwilagwe, 2002).

It has therefore become apparent that the lecture method which is currently the predominant teaching approach in Nigerian polytechnics is inappropriate and ineffective for achieving the high objectives of teaching and learning of keyboarding. There is, therefore, a dire need to search for more effective methods which are suitable and efficient for promoting the level of skill acquisition in keyboarding in Nigerian polytechnics. This therefore constitutes the background information in which the study was conducted on comparative study of Computer Assisted Instruction and traditional methods of teaching keyboarding among polytechnics students in South West Geo-Political Zone, Nigeria.

Computer has become an integral part of our day to day life as well as an integral part of the education system. Having Computer Assisted Instruction as part of the method in teaching and learning of keyboarding in polytechnics can prove very helpful. Keyboarding is one of the core skill subjects in secretarial option which students must master very well. No wonder that Yenice (2003) stated that there is significant relationship between background knowledge of keyboarding and computer application. He further suggested that the students of any computer programme should be exposed to the manipulation of that typewriter (keyboard) before they start the practical aspect of the computer study. This exposure is nothing other than the conscious effort on teaching methods that will enable these students grasps the proper keyboarding. However, Temidayo

(2009) observed that the method by which keyboarding is taught in polytechnics made students to lose interest in the secretarial option in Nigeria polytechnics.

Based on the researcher's interaction with students of some polytechnics in south west geo-political zone, Nigeria, it was observed that the traditional or old method of instruction was still predominantly used in the teaching and learning of keyboarding. The students complained that the method of teaching keyboarding is boring and does not motivate them, thereby making keyboarding difficult to learn. It was also observed that teachers of keyboarding complained that despite their effort in teaching keyboarding, there is still mass failure of students in keyboarding. The traditional method of teaching keyboarding which does not motivate the students, thus result to poor academic performance of students and generally nonchalant attitudes towards keyboarding. The traditional method does not support independent and self-control learning, immediate feedback, drills and practices which will enhance speed and accuracy.

These days students are fond of the act of 'pick and peck' (using one finger to type on the keyboard while the other hand is on the manuscript when typing) and this has contributed to low speed and accuracy and bad techniques of skills acquisition in keyboarding. All these might result from the wrong method used in teaching them at the initial stage. As a result of this, the researcher is of the opinion that, at this era of technology development, secretarial education or profession in Nigeria cannot be relevant to the present societal needs without preparing future labour force with appropriate method. This will assist the lower and medium manpower level produce in polytechnics to acquire necessary technological skills needed to function effectively on their work. In line with this opinion, Clever (2009) stated that secretarial education in Nigeria cannot be relevant without effective preparation of new generation students to effectively use the new ICT in their professional practice. Therefore, there should be more proactive, creativity and dynamism of methods in teaching and learning of keyboarding.

Temidayo (2009) outlined the three approaches to teaching keyboarding in the conventional classroom as horizontal, vertical and skip-around. Using any of the three approaches, in a group situation does not seem to facilitate enough student or teacher interaction (individualized teaching). None of the approaches makes it possible for the teacher to monitor each student's position or posture in relation to the keyboard and how key stroke is made. It is not also possible for the teacher to analyze each student's error and proffer solution within the lecture period.

Consequently, there is a delay on feedback which in turn builds-up to poor students' performance especially in speed and accuracy tests. Temidayo (2009) explained further that, moderators of keyboarding answer scripts have consistently commented negatively on the accuracy and speed acquisition by keyboarding students. He said further that, it has been found out that about 80% of keyboarding students lose all the marks allocated to this task in any keyboarding question paper. It is pertinent to find the most effective way of teaching and learning keyboarding so that less time is spent on its learning. It is also necessary to produce fast and accurate students in keyboarding as modern organizations rely on accurate and timely information for their survival and development. All these are the confronting problems which the study has addressed using empirical evidence. It is expected that the findings of the study will make students to appreciate the importance of using CAI in teaching and learning of keyboarding and most importantly to imbibe, embrace the culture and acquaint them generally with the various uses or application of

ICT skills even after graduation. It will also assist keyboarding teachers in Polytechnics to be up and doing. It will gear them up to acquire the necessary skills on how to use or incorporate CAI to complement the conventional methods of teaching the students.

2. Purpose of the study

The general objective of the study is to compare the Computer Assisted Instruction and traditional methods of teaching keyboarding among Polytechnics students in South West Geo-Political Zone, Nigeria. The specific objectives are to:

a. Compare the speed and accuracy of students being taught with Computer Assisted Instruction and traditional methods of teaching keyboarding in polytechnics in south west geo-political zone, Nigeria.

3. Research Questions

In line with each specific objective, the following research questions are formulated for the study within the scope of south west geo-political zone, Nigeria:

a. To what extent do the pretest and posttest speed and accuracy mean scores of students taught keyboarding with Computer Assisted Instruction method differ with the pretest and posttest speed and accuracy mean scores of students taught keyboarding with traditional method in polytechnics?

4. Research Hypothesis

In line with the research questions and within the scope of south west geo-political zone, Nigeria, the researcher tested the following null hypotheses:

H01: There is no significant difference between the mean score of speed and accuracy of students being taught with Computer Assisted Instruction and traditional methods of teaching keyboarding in polytechnics.

5. Methodology

Quasi-experimental research design was adopted for the study, the schools were assigned to experimental and control groups. The population of the study comprised ND I students from 10 polytechnics who were admitted in 2017/2018 academic session in both state and Federal polytechnics in South West zone, Nigeria. There are a total number of 980 ND I students. Purposive sampling technique was used to select six from the 10 polytechnics in the south west geo-political zone, Nigeria. Purposive sampling was used because of the available facilities in each of this polytechnic. Thirty students were selected from each polytechnic. Three polytechnics were used each for experimental and control groups. The polytechnics selected were: Lagos State Polytechnic Ikorodu, Osun State Polytechnic, Ire, Rufus Giwa Polytechnic, Owo, The Polytechnic Ibadan, Federal Polytechnic, Ilaro and Federal Polytechnic, Ado-Ekiti. Lagos State Polytechnic Ikorodu, was used as Computer Assisted Instruction group, Osun State Polytechnic, Ire as

traditional method group, Rufus Giwa Polytechnic, Owo as Computer Assisted Instruction group, The Polytechnic Ibadan, as traditional method group, Federal Polytechnic, Ilaro as traditional method group, and Federal Polytechnic, Ado-Ekiti as Computer Assisted Instruction group. From the six polytechnics, a total number of 180 students were selected. This comprised 90 males and 90 females randomly selected and randomly assigned to both Computer Assisted Instruction group and traditional method groups; that is, 30 students from each polytechnic. Keyboarding Speed and Accuracy Test (KSAT) was the instrument used for data collection. KSAT was duly validated with split half reliability coefficient of 0.81. The students were pretested after which the treatment began. The treatment period lasted for four weeks. The experimental group was taught with CAI method using Mavis Beacon Package while the control group was taught with traditional method where the participants also had access to computer but not with any software package. The two groups of participants had access to computer but the only difference between them was that the experimental group which is CAI group were given computer and Mavis Beacon typing software to follow with very little facilitation from the teacher. The control group on the other hand, were also given computer but without Mavis Beacon typing software rather the group was taught typing skills by the teacher on the computer. Mean and standard deviation were used to answer the data for the research question while Analysis of Covariance (ANCOVA) was used to test the hypothesis at 0.05 level of significance.

6. Results

Research Question 1

To what extent do the pretest and posttest speed and accuracy mean scores of students taught keyboarding with Computer Assisted Instruction method differ in polytechnics?

Table 1 Mean of pre-test and post-test scores of treatment group taught keyboarding using Computer Assisted Instruction method. Field experiment, 2018.

GROUP	**Experimental Group (CAI Method)**			**Control Group (Traditional Method)**		
	N	$\bar{X}$	**SD**	**N**	$\bar{X}$	**SD**
PRE-TEST	30	42.02	9.48	30	44.39	7.64
POST-TEST	30	76.03	10.11	30	52.56	8.55
MEAN & SD DIFFERENCE		34.01	0.63		8.17	0.91

The data presented in Table 1 revealed that the treatment group taught keyboarding with Computer Assisted Instruction method had a mean score of 42.02 in the pretest and a mean score of 76.03 in the post-test with standard deviation of 9.48 and 10.11 for the pre-test and post-test, respectively, pre-test (= 42.02; SD = 9.48), post-test (= 76.03; SD = 10.11). The result gave a pre-test, post-test mean gain of the treatment group taught with Computer Assisted Instruction method to be 34.01. The low standard deviation difference (0.63) showed that the scores of students in both the

pre-test and post-test are clustered around their respective mean scores. The traditional method had a mean score of 44.39 and standard deviation of 7.64 (= 44.39; SD = 7.64) in the pretest and mean score of 52.56 and standard deviation of 8.55 (= 52.56; SD = 8.55) in the posttest, giving a pre-test post-test mean gain in the control group taught keyboarding with traditional method to be 8.17. With this result, it is clear that Computer Assisted Instruction method is effective in improving students' speed and accuracy in keyboarding. The CAI group did better by far than the traditional method group.

7. Test of Hypothesis

The null hypothesis for the study was tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance and the summaries are presented in Tables 7 to 9 as follows:

> H01: There is no significant difference between the mean score of speed and accuracy of students being taught with Computer Assisted Instruction and traditional methods of teaching keyboarding in polytechnics.

Table 2 Summary of Analysis of Covariance (ANCOVA) for Test of Significance of difference between the mean score of speed and accuracy of students being taught with Computer Assisted Instruction and traditional methods of teaching keyboarding. Field experiment, 2018.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1231.051[a]	4	307.014	3.119	.002
Intercept	7688.775	1	7688.775	102.838	.000
Pretest	474.145	1	474.145	5.486	.021
Treatment	947.330	1	947.330	12.862	.000
Gender	164.322	1	163.322	1.880	.124
Treatment*gender	5.360	1	6.360	.064	.674
Error	4543.507	88	86.435		
Total	214522.000	90			
Corrected Total	10067.562	89			

a. R Squared = .141 (Adjusted R Squared = .107)

The data presented in Table 2 showed F-calculated values for effects of treatment of Computer Assisted Instruction method on students' speed and accuracy in keyboarding. The Table showed that there was a significant main effect of treatment of Computer Assisted Instruction on speed and accuracy of polytechnics students in keyboarding (F= 12.862; P = 000). Hence, the null hypothesis that stated that there is no significant difference between the mean score of speed and accuracy of students being taught with Computer Assisted Instruction and traditional methods of teaching keyboarding was therefore rejected. This implied that teaching with Computer Assisted Instruction method has positive effect on the speed and accuracy of polytechnic students in keyboarding. This means that the effect observed are due to the main treatment given to students.

Table 3 Estimated marginal means of both the treatment and control groups. Field experiment, 2018

Groups	Mean	Std. Error
Treatment	67.27	1.161
Control	49.98	1.503

The data in Table 3 showed estimated marginal means for the two groups, i.e the adjusted mean after the covariance. The Table revealed that the participants in experimental group performed better than their counterparts in control group because they had the highest adjusted post mean score (mean = 67.27) as against the adjusted posttest mean score of the control group (mean = 49.98). The implication here is that teaching with Computer Assisted Instruction method is effective for improving the speed and accuracy of polytechnics students in keyboarding far more than the traditional method.

8. Discussion

The study found that there was significant difference between the speed and accuracy of students taught using computer assisted instruction and traditional method (F= 12.862; P = 000). This could also be seen from the mean performance of computer assisted instruction of 76.03 which was greater than the mean of 44.39 for students taught using traditional method. The students taught with computer assisted instruction method performed better in terms of speed and accuracy than those taught with traditional method. The mean difference showed that the computer assisted instruction group was better than the traditional method group by 34.01 mean differences. This implied that computer assisted instruction method is the more effective in teaching speed and accuracy in keyboarding than the traditional method. This finding supports the earlier finding of Achilike (2002) who found that computer assisted instruction method of teaching keyboarding speed and accuracy if extensively supervised by the teacher led to greater acquisition of speed and accuracy in keyboarding by the students. Speed and accuracy skill can be acquired when students learn keyboarding without looking at the keys. This is also in line with Oyeyiola (2006) who found 58.6% failure in control groups post-test where the computer Assisted Instruction method of teaching keyboarding skills was not used. That was why Clever (2009) pointed out that computer assisted instruction method of keyboarding promotes faster speed and accuracy, acquisition of proper skills and techniques of keyboarding. This therefore makes it clear that if students are taught keyboarding with CAI, their academic performance will be better and proper skills will be acquired.

9. Conclusion

Based on the finding of the study which revealed that CAI students performed better in speed and accuracy than the traditional method students, it was therefore concluded that Computer Assisted Instruction method is better than the traditional method of teaching keyboarding. The implication here is that Computer Assisted Instruction method of teaching keyboarding speed and accuracy is a more effective teaching method for acquiring keyboarding skills and techniques. Since this is the case, it means that the continuous use of traditional method in teaching keyboarding will continue to negatively affect students' acquisition of proper keyboarding skills which will adversely affect their performance in the modern office when they eventually graduate.

10. Recommendations

a. Keyboarding teachers should use computer assisted instruction method in teaching speed and accuracy in keyboarding.
b. There is the need for the State and Federal Governments to encourage keyboarding teachers to go for in-service training or refresher courses to acquire additional qualifications in keyboarding skills so as to be able to incorporate gender equality in teaching of keyboarding.
c. Polytechnic Managements should also provide necessary facilities such as computers and software that will facilitate effective teaching and learning of keyboarding skills using Computer Assisted Instruction.
d. National Board for Technical Education (NBTE) should recommend the application of computer assisted instruction in teaching and learning of keyboarding skills, techniques and competences in various Polytechnics in Nigeria.

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