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Effect of Online Instruction on Keyboarding Speed Achievement among Office Technology and Management Students of Polythecnics in Nasarawa State

Nwaokwo Emilia Okechi[1] and Prof. Eze T.I.[2]

[1]department of Office Technology and Management
Federal Polytechnic Nasarawa, Nigeria
[2]department of Technical and Vocational Education
Faculty of Education
Nnamdi Azikiwe Universuty, Awka
Anambra State, Nigeria

Abstract: This paper determined the effect of online instruction on keyboarding speed achievement among office technology and management students in Nasarawa State. Three research questions guided the study and three null hypotheses tested at 0.05 level of significance. The population of the study was 184 National Diploma (ND) II OTM students in polytechnics in Nasarawa State. The convenience sampling technique was used to arrive at a sample of 95 students for the study. Pre-test Post-test non-equivalent group quasi-experimental research design was used for the study and the instrument for data collection was OTM Speed Test Instrument (OTMSTI) which was validated by experts. A reliability correlation coefficient of 0.87 was obtained for the test items using the Spearman's Correlation Co-efficient. Mean was used to analyze data relating to the research questions while analysis of covariance (ANCOVA) was used to test the hypotheses. Findings revealed that students taught keyboarding speed using online instruction performed relatively better with higher post-test mean achievement score than those taught using conventional teaching method. Findings also indicated that female students taught keyboarding speed using online instruction had greater post-test mean achievement score than their male counter-part taught with the conventional method. The interaction effect of teaching methods and gender was not significant on students' achievement in keyboarding speed. Based on the findings of the study, it was concluded that online instruction has the potential to improve Office Technology and Management students' speed achievement in keyboarding. It was recommended among others that lecturers should use online instruction in teaching keyboarding to enhance students' speed achievement in keyboarding.

Keywords: online instruction, management keyboarding speed, office technology, transcription

Introduction

The invention of the Internet have changed and has continued to change people's lives and activities in almost all aspects of life including education and training, transportation, communication, business, banking and leisure. Mbah (2016) stated that this modern technology has turned the world into a knowledge-based economy in which ideas and technological principles are used for better output. Hence, advancement in technology according to Muhammed, Asua and Munnaza (2015) has compelled teachers and educators to utilize its benefits for the delivery of instruction and promote learning through on-line learning. An area that has been most affected by these new innovations is the office. The space, tools and equipment, procedures/processes and personnel involved in the generation, maintenance and management of office information have been revolutionized. These changes especially in the functions of secretaries, have given rise to specific training and retraining needs for the secretaries. This is to ensure that the secretaries remain relevant and contribute adequately to the goals of their employers and the society. Salleh, Musa and Sulaiman (2017) noted that today's secretary has come to assume the rightful position as the chief organizer of the secretariat, its staff and equipment. The nomenclature has changed the job title from 'the secretary' to 'the office manager.'

Despite the above changes, the core competency area on which secretarial duties are anchored is the generation of information by 'note taking'. Before the invention of the typewriter, note-taking was entirely done manually in shorthand and subsequent handwritten transcription. In Office Technology and Management (OTM), the core skills centre on the use of computer to generate and process information with adequate and appropriate keyboarding speed .According to Career and Technical Education Resource Centre (CTERC, 2012), keyboarding refers to inputting of text on a standard alpha-numeric keyboard known as the QWERTY keyboard using the touch typing method.

In today society, keyboarding is evident in almost every aspect of life. One constantly experiences the need of keyboard training in the educational system for its sustainable development. Career and Technical

Education Resource Centre (CTERC, 2012) asserted that the main objectives of keyboarding is to develop a touch skill which can enable an individual to enter text especially on a computer at a speed faster than writing with hand. The source further observed that once keyboarding skills have been imbibed, students should be able to strike the right keys on a keyboard without looking at them or at the fingers. A graduate of National Diploma (ND) is expected to type a passage of 350 words in 10 minutes at the speed of 35 words a minute. (NBTE, 2014). Keyboarding speed are important requirements for effective performance, professional growth and upliftment of office technology and management students. However, most OTM students do not seem to acquire high speed that will enhance their work performance in employment considering the current mode of teaching keyboarding with manual typewriters.

Online learning encompasses a face-to-face, mixed and blended delivery model that utilizes electronic means. Such models include CDs, e-mails, watsapp, messenger, internet, computers and so on (Ugwoke , 2011). According to Obikeze and Onyechi (2011), online learning means formal and non-formal education that uses electronic delivery method such as internet learning delivery packages, CD-Rom, online video conferencing or e-mail to manage the relationship between learning and teaching. This paper uses the term online instruction to mean teaching keyboarding using computer instructional packages such as Mavis Beacon Teaches Typing. The Mavis Beacon Teaches Typing is an application software which can be installed in a computer for teaching and learning keyboarding. The software rates users at the completion of each task on accuracy, typing speed, errors and words per minute. At the end of the exercise, users can also print their result which comes out in a certificate format.

As Micheal and Heather (2014) insinuated, not only is on-line instruction fast becoming an important mode of teaching and learning, it is becoming more and more acceptable, affordable and therefore preferable. With increasing demand for Vocational Technical Education (VTE) (especially OTM) amidst declining instructional facilities, the most practical solution will be online instruction. Furthermore, more and more professionalsin other fields who depend on the knowledge, skills and expertise of office managers are themselves becoming highly computer literate and know fairly well about keyboarding. Consequently, the demand for office managers (specialists in the field)will decline unless they continue to maintain an edge in their own profession by out-performing all others in note-taking via keyboarding in order to remain dependable and indispensable.

Gender influence in students' academic achievement is a crucial matter to the educationist. Oluwatulure (2015) asserted that gender refers to the social attributes and opportunities associated with being a male or female, woman or man and being a girl or boy. Dania (2014) and Filgona, Sababa and Filgona (2016) argued that gender cannot be factored in students' performance but Adeyemi and Ajibade (2011) posited that gender plays an important role in students' achievement. It is not clear if these performance indices would not change if new instructional methods like online teaching are adopted in teaching a skill course such as keyboarding, hence, this paper will test gender.

Statement of the Problem

The integration of ICTs in education has led to significant changes in both the structure and functionality of education in Nigeria and other countries. One of these changes on delivery modes is on-line instruction. Researchers such as Ukonu, Sababa and Filgona (2017) have conducted studies on effective methods of teaching keyboarding other than face-to-face instruction in business education programme generally but studies on using online instruction in teaching keyboarding seem to be scanty. Of all the courses taught in a 2-year National Diploma (ND) programme in OTM in Nigerian polytechnics, only keyboarding and shorthand feature in three of the four semesters of the programme. Despite this, there is little or no evidence that the lecturers are adopting on-line method of instruction. According to Ukonu, Sababa and Filgona (2017), keyboarding is a popular business course whose major purpose is to develop touch control of the keyboard to achieve appropriate typing skills. Consequently, OTM students require high speed that will enhance their professional growth in employment. OTM NDII students' achievement in keyboarding speed is on the decline. The reason for this situation may not be unconnected with the methods of instruction adopted by lecturers which are mostly conventional. It is expected that adoption of on-line instruction which is innovative will stimulate students' interest in keyboarding instruction leading to higher achievement in speed. However, this is an assumption that needs to be established with empirical evidence, hence this paper.

Related Empirical Studies

Empirical researchers on effect of online instruction on keyboarding speed achievement of OTM students is not common, however, some related studies have been reviewed as follows:

Okoduwa (2007) conducted a study on the comparison of the performance of Part 1 NCE students taught keyboarding by traditional teacher-directed instruction and those taught by computer assisted instruction.

The study was carried out in Agbor, Delta State and was a quasi-experimental study. A sample of two intact classes of 30 students each was used for the study. Data collected were analysed using the Analysis of Covariance (ANCOVA). The result of the study showed that there was a better learning outcomes with those taught with traditional teacher-directed method than those taught with the computer assisted instruction. There was no significance difference in the performance of male and female students taught keyboarding by traditional teacher-directed method and those taught by computer assisted instruction.

Furthermore, Lin and Wu (2011) conducted a study on factors affecting numerical typing performance of young adults in a hear-and-type task on typing speed and accuracy. The study was carried out in the United State of America with an intact group of 20 participants made up of 13 males and seven females. The design of the study was experimental. Analysis of Covariance (ANCOVA) was used to determine if the expertise of typing shown in the pretest would have any influence on speed and accuracy in the post test. The findings revealed that urgency improved typing speed but decreased accuracy showing that urgency affect typing performance.

Ekoro, Ofem and Udo (2016) assessed the role of Computer Assisted Instruction (CAI) in enhancing students' mastery of keyboarding in Cross River State College of Education. Three research questions guided the study and three hypotheses were tested at 0.05 level of significance. The study adopted the quasi experimental design. A sample of 60 students was selected using the stratified random sampling technique. The instrument for data collection was the Mavis Beacon Typing Tutor and the ANOVA was used for data analysis. The study showed that computer assisted instructions has a positive impact on keyboard mastery. Furthermore, female students mastered the keyboard faster than their male counterparts.

Onojaife (2018) conducted a study on strategies considered effective for teaching keyboarding by OTM lecturers in polytechnics in Delta State. The study used three research questions and three hypotheses. A descriptive survey design was adopted. A population of 140 OTM lecturers in polytechnics in Delta State was studied without sampling due to the manageable size. A validated 4-point rating scale questionnaire containing 30 items was used for data collection. Mean and standard deviation were used to answer the research questions while t-test was used to test the hypotheses at 0.05 level of significance.

Findings of the study revealed that OTM lecturers in Delta State considered direct teaching strategies ineffective but rated experimental and independent teaching strategies effective for teaching keyboarding. It was concluded that the utilization of experimental and independent teaching strategies by OTM lecturers will equip students with relevant keyboarding skills with which to produce readable and error free keyboarding presentations. The study recommended among others that, OTM lecturers should be encouraged to use experimental and independent teaching strategies in teaching skill subjects such as keyboarding in educational institutions where keyboarding are offered.

Ukonu, Sababa and Filgona (2017) on effects of hands-on teaching strategy on students' achievement and its effect on gender in keyboarding, The researchers adopted the quasi-experimental design. The sample was 120 ND1 students from the department of office technology and management, Federal Polytechnic, Mubi. The instrument for data collection was titled Keyboarding Achievement Test (KAT) constructed by the researcher. The instrument was validated and pilot tested. The data was analysed using t-test statistics and ANCOVA. The study revealed that students exposed to hands-on teaching strategy achieved better results than those taught using the conventional method. There was no significance effect of gender on students' academic achievement whether exposed to keyboarding skill acquisition using hands-on teaching or conventional method.

Purpose of the Study

The main purpose of the study is to determine the effect of on-line instruction on keyboarding speed achievement among office technology and management (OTM) students of polytechnics in Nasarawa State. Specifically, the study determined the:

1. Effect of on-line instruction on keyboarding speed achievement among OTM students of polytechnics in Nasarawa State when compared with those taught with conventional method.
2. Effect of on-line instruction on keyboarding speed achievement among male and female OTM students of polytechnics in Nasarawa State.
3. Interaction effect of instructional methods and gender on keyboarding speed achievement among OTM students of polytechnics in Nasarawa State.

Research Questions

The following research questions guided the study.

1. What is the effect of on-line instruction on keyboarding speed achievement among OTM students of polytechnics in Nasarawa State when compared with those taught with conventional method.

2. What is the effect of on-line instruction on keyboarding speed achievement among male and female OTM students of polytechnics in Nasarawa State using their pre-test and post-test scores?
5. What is the interaction effect of instructional methods and gender on keyboarding speed achievement among OTM students of polytechnics in Nasarawa State?

Hypotheses

The following null hypotheses was tested at 0.05 level of significance.

1. There is no significant difference in the mean keyboarding speed achievement of OTM students in polytechnics in Nasarawa State taught with on-line instruction and their counterpart taught using conventional methods of instruction.
2. There is no significant difference in the mean keyboarding speed achievements of male and female OTM students in polytechnics in Nasarawa state taught with online instruction when compared with those taught with conventional instructional methods.
3. There is no significant interaction effect of instructional methods and gender on the mean keyboarding speed achievement among OTM students in polytechnics in Nasarawa State.

Methods

The study adopted the quasi-experimental design. The study was carried out in Nasarawa State. The population of the study consisted of 184 (110 females and 74 males) ND II students in all three polytechnics in Nasarawa State in the 2018/2019 academic session. The sample was made up of 95 ND2 students drawn from one federal and one state polytechnic in the area of study. The sample consisted of two intact classes from the two polytechnics. A simple random sampling technique was used to assign one class to experimental and control groups. The experimental group consisted of 60 students (29 males and 31females) while the control group comprised of 35 students (16 males and 19 females). Instrument for data collection consisted of a passage of 350 words to be produced at a speed of 35 words a minute for 10 minutes and titled OTM Speed Test Instrument (OTMSTI) and was validated by experts. The reliability of the instrument was established using the test-retest method because of the practical nature of the instrument. It was administered on 10 ND II OTM students who are not part of the population of the study and was re-administered after two weeks. Using the Spearman's Correlation Co-efficient, a reliability co-efficient of 0.78 was obtained.

At the end of the 4 weeks experiment where the experimental group was taught by online method and the control group taught by conventional method, both groups took the same final test (post-test). The experimental group used the Mavis Beacon Software as installed in their computers via CD-ROM while the control group used the manual typewriters. The arithmetic mean was used to answer the research questions while the Analysis of Covariance (ANCOVA) was used in testing the hypotheses at 0.05 level of significance.

Results

The results of the study were obtained from the research questions answered and hypotheses tested and are presented in the tables below:

Research Question 1: What is the effect of on-line instruction on keyboarding speed achievement among OTM students of polytechnics in Nasarawa State when compared with those taught with conventional method using their pre-test and post-test scores?
Analysis of data for research question 1 is presented in Table 1.

Table 1: Mean keyboarding speed achievement scores of students taught using on-line instruction and those taught using conventional method

Teaching Method	Pre-test			Post-test			Mean Gain Score
	N	Mean	SD	N	Mean	SD	
On-line instruction	60	34.98	1.21	60	37.78	2.25	2.80
Conventional Method	35	34.60	1.31	35	35.09	1.17	0.49

Table 1 shows that students taught using online instruction had pre-test and post-test scores of 34.98 and 37.78 with achievement mean gain of 2.80 while those taught using conventional method had pre-test and post-test scores of 34.60 and 35.09 with achievement mean gain of 0.49. This indicates that whereas the pre-test mean score of the students taught keyboarding speed using online instruction was slightly higher than that of those taught using conventional method, their post-test and achievement mean gain scores were significantly

higher than those of the class taught with conventional method. This clearly shows that on-line instructional method was more effective in enhancing students' achievement in keyboarding speed than the conventional method.

Hypothesis 1: There is no significant difference in the mean keyboarding speed achievement of OTM students in polytechnics in Nasarawa State taught with on-line instruction and their counterpart taught using conventional methods of instruction.

Table 2: Summary of Analysis of Covariance of Students' Keyboarding Speed Achievementby Teaching Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	172.987[a]	2	86.494	23.910	.000
Intercept	83.516	1	83.516	23.087	.000
Speed Pretest	12.124	1	12.124	3.352	.070
Group	144.699	1	144.699	40.001	.000
Error	332.8029	23	6.17		
Total	129085.0009	5			
Corrected Total	505.7899	4			

Table 2 shows that the calculated F-ratio of 40.00 is greater than the significance level of 0.05 ($P < 0.05$). This means that there is a statistically significant difference in the mean keyboarding speed achievement of OTM students taught with on-line instruction over their counterparts taught using conventional method of instruction. The null hypothesis of no significant difference between the two groups was, therefore, rejected.

Research Question 2: What is the effect of on-line instruction on keyboarding speed achievement among male and female OTM students of polytechnics in Nasarawa State using their pre-test and post-test scores?

Analysis of data for research question 2 is presented in Table 3.

Table 3: Mean scores of male and female students taught keyboarding speed using on-line instruction

Group	Gender	Pre-test			Post-test			Mean Gain Score
		N	Mean	SD	N	Mean	SD	
On-line Instruction	Male	29	34.93	1.41	29	37.55	2.16	2.62
	Female	31	35.03	1.02	31	38.00	2.34	2.97

Table 3 shows that male students taught keyboarding using on-line instruction had pre-test and post-test speed achievement mean scores of 34.93 and 37.55 with a mean gain score of 2.62 while the female students had pre-test and post-test speed achievement mean scores of 35.03 and 38.00 with mean gain score of 2.97. This shows a difference in speed achievement mean gain score of 0.35 (which is not significant) in favour of the female students.

Hypothesis 2: There is no significant difference in the keyboarding speed achievements scores of male and female OTM students in polytechnics in Nasarawa State taught with online instruction when compared with those taught with conventional instructional methods.

Table 4: Summary of Analysis of Covariance of Students' Keyboarding Speed Achievementby Teaching Method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	31.971[a]	2	15.986	3.104	.050
Intercept	54.671	1	54.671	10.615	.002
Accuracy Pretest	29.579	1	29.599	5.743	.019
Group	3.683	1	3.683	.715	.400
Error	473.818	92	5.150		
Total	129085.000	95			
Corrected Total	505.789	94			

Table 4 shows that the calculated F-ratio of .71 is less than the significance level of 0.05 ($P < 0.05$). This means that there is no statistically significant difference in the mean keyboarding speed

achievement of male and female OTM students taught with on-line instruction with their counterparts taught using conventional methods of instruction. The null hypothesis of no significant difference between the two groups was, therefore, not rejected.

Research Question 3: What is the interaction effect of instructional methods and gender on keyboarding speed achievement among OTM students of polytechnics in Nasarawa State?
Analysis of data for research question 3 is presented in Table 5.

Table 5 : Mean interaction effect of instructional methods and gender on keyboarding speed achievement

Teaching Method	Gender	Pre-test			Post-test			Mean Gain Score
		N	Mean	SD	N	Mean	SD	
Online Instruction	Male	29	34.93	1.41	29	37.55	2.16	2.62
	Female	31	35.03	1.02	31	38.00	2.34	2.97
Conventional Method	Male	16	34.94	1.18	16	34.94	1.12	0.00
	Female	19	34.32	1.38	19	35.21	1.23	0.89

Table 5 shows the pre-test and post-test keyboarding speed achievement mean gain of male and female students taught with online and conventional instructional methods. In each case, the female students achieved slightly higher speed achievement gain scores (below 1.00) than their male counterparts. These show that there is no significant interaction effect of instructional methods and gender on keyboarding speed achievement among OTM students.

Hypothesis 3: There is no significant interaction effect of instructional methods and gender on the mean keyboarding speed achievement among OTM students in Polytechnics in Nasarawa State.

Table 6: Summary of Analysis of Covariance of Students' Mean Scores in keyboarding speed by Gender and Teaching Method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	177.420[a]	4	44.355	12.157	.000
Intercept	78.648	1	78.648	21.556	.000
Speed Pretest	12.898	1	12.898	3.535	.063
Group	145.245	1	145.245	39.809	.000
Gender	4.197	1	4.197	1.150	.286
Group * Gender	.010	1	.010	.003	.959
Error	328.369	90	3.649		
Total	129085.000	95			
Corrected Total	505.789	94			

Table 6 shows that there is no statistically significant interaction between the mean keyboarding speed achievement of male and female students taught with online instruction and those taught with conventional instructional methods, $F(1,95) = .003$, $P > 0.05$.. The null hypothesis was, therefore, not rejected

Discussion

Table I revealed that students who were taught keyboarding speed using online instruction method achieved higher post-test scores than those taught using conventional teaching method. Similarly the result of the study showed that there is a statistically significant difference in the mean keyboarding speed achievement of OTM Students taught with on-line instruction and their counterpart taught with conventional method. This result is in line with the findings of Haruna and Ekeh (2011) which reported that teaching method other than conventional method had a significant effect on post-test achievement scores of students. This finding is also in line with the findings of Blazek's (2015) which revealed that the use of technology can enhance the acquisition of skills and knowledge for students when the computer is used to deliver well designed instruction.

Results of table 3 revealed that male and female students taught keyboarding using online instruction method differ significantly in post-test scores. The study revealed that male and female students taught keyboarding using online instruction method achieved better in accuracy in their post-test mean scores. This indicated that the online instruction was effective and has the potential of improving students' achievement in speed in keyboarding. This result is line with the findings of Ukonu, Sababa and Filgona (2017) which reported

that students exposed to keyboarding skills acquisition through hands-on strategy achieved better results than those taught with the conventional method. The test of hypothesis on table 4 showed no significant effect of gender on achievement of students exposed to keyboarding skill acquisition using hands-on teaching with conventional method. Ekanem (2008) findings showed a narrow but higher performance in favour of the girls in speed achievement as against the boys. The study also revealed that students taught with online instruction performed better and that gender was insignificant in speed achievement of students taught using online instruction.

Table 5 showed that there is no interaction effect between the methods of instructional delivery and gender on students mean scores in keyboarding speed achievement. This result is in consonance with the observations of Ganyaupfu (2013) that an alignment of teaching methods with students' preferred learning influences students achievement. Ajai, Imoke and Okwu's (2013) findings is also in line with the findings as the researchers' study revealed that students achieved significantly higher scores in their posttest than those taught using conventional method and there was no significant interaction effect of methods and gender on students' achievement.

Conclusion

The paper examined the effect of online instruction on OTM students keyboarding speed achievement in polytechnics in Nasarawa state. Based on the findings of the study, it was concluded that online instruction has proved to be an effective method for improving students' speed achievement in keyboarding.

Recommendations

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

1. Keyboarding lecturers should use online instruction through Mavis Beacon Teaches Typing in teaching to enhance students' achievement in keyboarding speed .
2. National Board for Technical Education (NBTE) should restructure the keyboarding curriculum at the ND level to eliminate the use of manual typewriters as instructional equipment.
3. Management of polytechnics should provide adequate computers to enhance the use of computer keyboards for keyboarding instructions.

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