

Experimental Analysis of The Effects of Graphic Organizer Strategy and Age on Computer Anxiety of Distance Learning Students of University of Ibadan, Nigeria

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Abstract

This study examined the experimental analysis of the effects of graphic organiser strategy and age on computer anxiety of distance learning students of University of Ibadan, Nigeria. Pretest-posttest, control group quasi-experimental design with a 2x2 factorial matrix was used in the study. Multi-stage sampling technique was used in sampling 114 participants from 2 faculties of distance learning centre. The respondents were measured with validated scale of 0.86 reliability coefficient and the data obtained was analyzed using t-test statistical analysis. Two (2) research hypotheses were formulated and tested at 0.05 level of significance. The results showed that there was significant difference in the computer anxiety of distance learning students exposed to graphic organiser strategy and those in the control group ($t= 41.36$; $p<0.05$) and there was significant difference in the computer anxiety of old and young distance learning students ($t= 28.53$; $p<0.05$). In view of these findings, the study recommended that students should be encouraged and trained on the effective usage of graphic organiser strategy and that old students should be encouraged to improve on the usage of computer for academic development. This is because computers are being used majorly for academic tasks in distance learning centre.

Keywords: Graphic Organizer Strategy, Computer Anxiety, Age and Distance Learning Students

Introduction

Distance education in the 21st century encompasses the use of computer mediated resources in most of its activities globally include course and examination registration, online facilitation, continuous assessment, counselling, advice and guidance and other learner support services. In such setting, learners are physically separated from their lecturers (facilitators) and other learner support personnel, but the separation is mediated or bridged through Information and communication technology (ICT). Open and distance learning education is one of the most growing fields of education and its potential impact on education delivery system has been accentuated through the development of Information and Communication Technology-based technologies, and the World Wide Web (Olusola & Alaba, 2011; Muraina & Muraina, 2015).

Computer anxiety is a construct that has lived with many users since its invention. In this twenty-first century, computer has permeated virtually every aspect of human life including education. Studies have shown the relatedness of computer anxiety and performance effectiveness among students generally and distance learning students specifically (Oluwole, 2009; Muraina & Muraina, 2015). Computer anxiety stands to have far-reaching negative effects on distance learning students because of high level integration of computer-mediated resources involved in such setting. Computer anxiety is a form of disposition that negatively affects the use of computer or effective performance of computer-related tasks by an individual. Computer anxiety is one of the basic factors affecting computer usage. Marcoulides (1989) describes computer anxiety as a prejudice or fear that occurs when a person uses computer technology or when they think about the results of computer usage.

However, it has been observed that distance learning students with computer anxiety find it difficult to cope and benefit maximally from the online opportunities available in the centre. Such online opportunities include student support services, access to electronic information, virtual libraries hosting a large collection of electronic

databases, e-books, free research publications, learner management system and collaboration with facilitators/lecturers and students (Olusola & Alaba, 2011). Computer anxiety is capable of impeding academic success and general comfort in the pursuit of their studies. Apart from these, it could lead to other things like dropout, lack of interest in studies, failure, and unnecessary physical and emotional stress.

Computer anxiety is doubtlessly one of the major factors affecting coping capabilities of distance learning students in Nigeria. Prominent factors that hinder the effective application of ICTs to distance learning education in Nigeria include low ICT skills, poverty, intermittent power supply, political bottle necks, poor economy and culture. This has subjected many to test anxiety, reluctance to write the online continuous assessment, use of third party to help submit assignment online due to computer apprehension, incessant suspension/deferment of examination, outright withdrawal from programme, among others. The issue of computer anxiety is an inhibiting factor for optimal achievement among distance learning students (Muraina & Muraina, 2015). It is on this basis that the present study concentrates on the use of graphic organiser strategy in reducing computer anxiety among distance learning students.

Graphic organiser strategy is a visual tool that illustrates the relationships between ideas, facts and terms within a learning task. Information depicted using this tool is easier to understand and learn (Dye, 2000). Graphic organiser strategy sometimes referred to as concept mapping, semantic web strategy or advance diagram technique. Graphic organiser strategy had been used to improving student learning and performance across grade levels in relation to computer usage (Troyer, 1994), reading comprehension (Bowman, 1998), development of thinking and learning skills (Doyle, 1999; Griffin, Malone, & Kameenui, 1995). Meyer (1995) examined the effects of graphic organiser strategy found that the idea organizing tools helped the students in the experimental group keep to the topic and organize their ideas logically. Gallick-Jackson (1997) found graphic organiser strategy effective in the classroom-based research with second-grade students to improve their narrative computer skills, composition skills, and related attitudes toward computer.

Graphic organiser strategy was reported as facilitating students in brainstorming and organizing ideas (Hopkins, 2002). He stated further that graphic organiser strategy was implemented to assist the development of 15 low-achieving tenth grade student's essay computer skills. The use of graphic organiser strategy as a means of increasing student comprehension, aiding in recalling previously stored information from memory, and having an overall positive effect on students' attitudes toward computer is supported in literature. Computer students especially benefit from graphic organiser strategy, according to Gallavan and Kotter (2007). He stated further that graphic organiser strategy help students sort, simplify, show relationships, make meaning, and manage data quickly and easily. Also, Governale (1997) suggests that students will become more interested in computer when graphic organiser strategy is used before, during, and after the lesson. The organiser will allow the students to compare and contrast individuals, groups, and events.

Age as moderating variable in this study, Dyck and Smither (1994) stated that age is a factor to reckon with in relation to students' computer anxiety. Ellis and Allaire (1999) found that older and middle aged students have shown high level of anxiety with respect to use of computers compared to that of the younger students. Kelley and Charness (1995) also hypothesized the effect of age on computer performance due to age-related deficiencies, thus causing the need for more time to accomplish tasks. Such older computer users (particularly over the age of 65) have less confidence in their ability to use computers than did younger people and had fewer computer skills. This was seen to be partly due to their inability to adapt and use technology, thus placing them at a disadvantage in terms of their ability to successfully perform computer tasks with ease and devoid of anxiety. Cambre and Cook (1987) also discovered that the older adult group of men and women (ages between 60 to 91 years old) have more computer anxiety and lower computer efficacy as compared to the younger group.

Todman and Lawerson (1992) found that adults were more fearful about using computers than children and teenagers. When older adults (55 years and older) were compared to younger adults (30 years and under), older

adults were less anxious about computers than younger adults. Older adults also had more positive attitudes toward computers though they had less computer experience than younger adults (Dyck & Smither, 1994). However, Laguna and Babcock (1997) found that older adults had higher anxiety than younger adults while taking computer-based cognitive test. Older adults also generally had less computer experience than younger adults. On the other hand, certain researchers reported no relationship between the two variables since the connection between the two elements is not easily observed when the age range is narrow (Reed, Doty, & May, 2005).

Negative emotions associated with computer anxiety can affect the overall learning experience such as frustration, confusion, anger, anxiety, and similar emotional states can affect not only the interaction itself, but also productivity, learning, social relationships, and overall well-being. In Nigeria, many authors have cited shortages of required skill as one of the hindrances to ICT utilization (Muraina & Muraina, 2015; Farrel & Shafika, 2007). One of the ways suggested to address these challenges is to encourage staff training and development especially in ICT usage. When such training and development programmes are organized, it is important to measure their impact on achievement of desired goal in an organisation. It was further observed that studies on the use of graphic organiser strategy and age on computer anxiety of students is very scarce to the best knowledge of the researcher. Research on computer anxiety is very scanty in Nigeria. Majority of the available studies did not address computer anxiety despite the enormity of the problem in the institution. Also, researchers in computer anxiety majorly concentrated on descriptive survey research with few experimental studies are also available globally. There is doubtlessly a dare need for experimental studies to reveal strategies to reduce computer anxiety among distance learning students which is the focus of this study aimed at determining the effectiveness of graphic organiser strategy in reducing the anxiety. In view of this, the present study intends to examine the experimental analysis of the effects of graphic organiser strategy and age on computer anxiety of distance learning students of University of Ibadan, Nigeria.

Statement of the Problem

The growth rate for enrollment in distance learning centres is not expected because when discussing online education, several benefits come to mind such as flexibility and conveniency among others. Online education allows individuals who cannot participate in residential courses access to higher education. It opens up potential professions and college programmes throughout the country to non-traditional students, as well as traditional students who want to live at home to minimize educational costs. However, demanding professional commitments and family responsibilities of many adults often make studying in conventional face-to-face, full-time, institutions with fixed timetables looks unrealistic proposition. For the above reasons, many people choose distance education system primarily due to the convenience, flexibility and adaptability of this mode of education to suit individual students' needs.

Computer anxiety has been shown to have physiological as well as psychological effects. Sweaty palms, dizziness, shortness of breath and the inability to take action have been found when computer anxiety is present. Other specific feelings associated with anxiety are irritation; frustration and bewilderment. Computer anxiety is a serious challenge to distance learning students in Nigeria. Therefore, this study targeted at reducing computer anxiety using graphic organiser strategy will be highly beneficial to distance learning students.

Objectives of the Study

The main objective of this study is to examine the experimental analysis of the effects of graphic organiser strategy and age on computer anxiety of distance learning students of University of Ibadan, Nigeria. Specifically other objectives include to;

1. find out the difference in the computer anxiety of distance learning students exposed to graphic organiser strategy and those exposed to conventional lecture method
2. investigate the difference in the computer anxiety of old and young distance learning students

Hypotheses

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

HO₁: There is no significant difference between the computer anxiety of distance learning students exposed to graphic organiser strategy and those exposed to conventional lecture method

HO₂: There is no significant difference between the computer anxiety of old and young distance learning students

Methodology

The study adopted the pretest-posttest, control group quasi-experimental design with a 2x2 factorial matrix. In essence, the row consists of graphic organiser strategy and the control. The row was crossed with age varied at two levels (old and young). The population for the study comprised 178,389 distance learning students of University of Ibadan, Nigeria as at 2016/17 academic session.

Multi-stage sampling technique was used for the study. The first stage involved the use of simple random sampling technique to select 2 faculties. The second stage witnessed the selection of 3 departments from each sampled faculties. Twenty distance learning students (participants) were sampled in each department through balloting and this cut across different levels and age range. On the whole, 120 students were drawn for the study. However, the whole population was grouped into two, one group formed graphic organiser strategy class and the remaining one served as control group.

The Computer Anxiety Rating Scales (CARS) is a 19 items self-report inventory, developed and validated by Heinssen, Glass and Knight (1987). The items were built on a five-point type scale (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree). Total scores ranged from 19, indicating a low level of computer anxiety, to 95, which would indicate a high degree of computer anxiety. The instrument has a test re-test reliability of .79. The instrument was however re-validated and Cronbach alpha value of .86 was obtained in a pilot study. Age was determined from demographic characteristics of participants. Students below 30 years were categorized as young while those above 30 years of age were classified as old in this study.

Inclusion and Exclusion Criteria

The following criteria were used in selecting the participants for the study:

- i. Participants should be bonafide students of distance learning (University of Ibadan)
- ii. Participants willing to participate in the treatment programme
- iii. Participants should be between 200 and 300 level

The study was carried out in four phases: pre-sessional activities, pre-test, treatment and post-test. At the pre-session, activities included the screening, recruitment and assignment of participants to the experimental and control group. Advertisement was made to request for participants in the university. A preliminary meeting was organised to familiarise with the interested participants and to solicit their willingness to participate in the study.

At the pre-test stage, computer anxiety scale was administered to the participants. Participants in the experimental group only were exposed to 6 sessions of treatment. Each session spanned for an average of 60 minutes (an Hour). Though the control group was not treated, they were exposed to a lecture titled "Distance and Open Education System in Nigeria". The post-test was administered following the conclusion of the programme.

T-test statistical analysis was employed to analyse the data in this study. T-test was used so as to establish any significant difference in the computer anxiety of participant in treatment group and control as well as age level.

Results

The study examined the experimental analysis of the effects of graphic organiser strategy and age on computer anxiety of distance learning students of University of Ibadan, Nigeria. Two (2) null hypotheses were formulated and tested at 0.05 level of significance. The results are presented in tabular form:

Hypothesis One: There is no significant difference between the computer anxiety of distance learning students exposed to graphic organiser strategy and those in the control group

Table 1: Summary of t-test of Adolescents Exposed to Graphic organiser strategy and those exposed to Conventional Lecture Method

Groups	N	Mean	SD	Std. Error	DF	t	p	Remark
Graphic Organiser Strategy	54	17.45	5.27	1.07	113	41.36*	0.00	* S
Lecture Method	60	73.16	23.95	10.68				

* Significant at $p < 0.05$

The result in table 1 showed that there was significant difference between the computer anxiety of distance learning students exposed to graphic organiser strategy and those in the control group ($t = 41.36$; $p < 0.05$). The mean value of the table further revealed that the students in graphic organiser strategy had lower computer anxiety than their counterpart in the control group. This further meant that the treatment had significant influence on computer anxiety of distance learning students.

Hypothesis Two: There is no significant difference between the computer anxiety of old and young distance learning students

Table 2: Summary of t-test of Computer Anxiety of Old and Young Students

Groups	N	Mean	SD	Std. Error	DF	T	p	Remark
Old	47	69.78	11.21	2.09	113	28.53	0.001	* S
Young	67	30.24	4.72	1.28				

* Significant at $p < 0.05$

Table 2 showed that there was significant difference between the computer anxiety of old and young distance learning students ($t = 28.53$; $p < 0.05$). The mean value of the table further revealed that young students had lower computer anxiety than their old counterpart. This further meant that age had significant influence on computer anxiety of distance learning students.

Discussion

The result in the Table 1 showed that there was significant difference between computer anxiety of distance learning students exposed to graphic organiser strategy and those in the control group. The mean value of the table further revealed that the students in graphic organiser strategy had lower computer anxiety than their counterpart in the control group. This further meant that the treatment has significant influence on computer anxiety of distance learning students. In line with this finding, graphic organiser strategy had been used to improving student learning and performance across grade levels in relation to computer usage (Troyer, 1994). Also, Meyer (1995) examined the effects of graphic organiser strategy found that the idea organizing tools helped the students in the experimental group keep to the topic and organize their ideas logically. Gallick-Jackson (1997) found graphic organiser strategy effective in the classroom-based research with second-grade students to improve their narrative computer skills, composition skills, and related attitudes toward computer. Graphic organiser strategy was reported as facilitating students in brainstorming and organizing ideas (Hopkins, 2002). He stated further that graphic organiser strategy was implemented to assist the development of 15 low-achieving tenth grade student's essay computer skills. Computer students especially benefit from graphic organiser strategy, according to Gallavan and Kotter (2007). He stated further that graphic organiser strategy help students sort, simplify, show relationships, make meaning, and manage data quickly and easily.

The result of Table 2 revealed that there was significant difference between the computer anxiety of old and young distance learning students. The mean value of the table further revealed that young students had lower computer anxiety than their old counterpart. This further meant that age had significant influence on computer anxiety of distance learning students. This is consistent with the study of Ellis and Allaire (1999) who found that older and middle aged students have shown high level of anxiety with respect to use of computers compared to that of the younger students. Kelley and Charness (1995) also hypothesized the effect of age on computer performance due to age-related deficiencies, thus causing the need for more time to accomplish tasks. Such older computer users (particularly over the age of 65) have less confidence in their ability to use computers than did younger people and had fewer computer skills. This was seen to be partly due to their inability to adapt and use technology, thus placing them at a disadvantage in terms of their ability to successfully perform computer tasks with ease and devoid of anxiety. Cambre and Cook (1987) also discovered that the older adult group of men and women (ages between 60 to 91 years old) have more computer anxiety and lower computer efficacy as compared to the younger group. Todman and Lawerson (1992) found that adults were more fearful about using computers than children and teenagers. Older adults also had more positive attitudes toward computers though they had less computer experience than younger adults (Dyck & Smither, 1994). However, Laguna and Babcock (1997) found that older adults had higher anxiety than younger adults while taking computer-based cognitive test. Older adults also generally had less computer experience than younger adults.

Recommendations

Based on the findings from the study, the following recommendations were made:

1. Educational stakeholders should intensify their effort to organize seminars/conferences on the implications of graphic organiser strategy as effective interventions towards reducing computer anxiety among distance learning students.
2. The researchers and stakeholders in education should not only focus on the students' achievement alone but also their computer anxiety. This is because computer anxiety influences significantly the academic tasks of distance learning students.
3. Teachers and other stakeholders in the school system are to be trained on how to improve usage of graphic organiser strategy. This will serve as collaborative efforts to assist the students in overcoming the challenges of high computer anxiety among distance learning students.
4. The students in the school should be encouraged and trained on the effective usage of these interventions (graphic organiser strategy). This will make the students to adopt effective attitude towards reducing their computer anxiety.
5. The old students should be encouraged to improve on the usage of computer for academic development. This is because computers are being used majorly for academic tasks in distance learning centre.

Conclusion

The National Policy on Education adequately provided for the Open and Distance Learning (ODL) in Nigeria. It described it as a mode of teaching in which learners are removed in time and space from teacher. The policy added that ODL uses a variety of media and technologies to provide and/or improve access to good quality education for large number of learners wherever they may be. The policy more explicitly captured the ODL as a system which encompasses education for all, education for life, life-long learning, life-wide education, adult education, mass education, media- based education, self-learning, personalised learning, part-time studies, and much more. Base on the findings of this study, persistent high computer anxiety of Nigerian distance learning students need not to continue indefinitely. There is hope that with the improvement of age range and graphic organiser strategy, the situation can be changed for the better. The study found that age and graphic organiser strategy influence the computer anxiety among distance learning students. By and large, age and graphic organiser strategy had a great influence on the computer anxiety among distance learning students.

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