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EFFECT OF E-CONTENT INSTRUCTIONAL STRATEGY ON ACADEMIC ACHIEVEMENT AND RETENTION OF BUILDING CONSTRUCTION STUDENTS IN UNITY COLLEGES IN NORTH CENTRAL NIGERIA

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ABSTRACT

The study was designed to determine effect of E-Content Instructional Strategy on Academic Achievement and Retention of Building Construction Students in Unity Colleges in North Central Nigeria The study adopted quasi-experimental, pre-test post-test non-equivalent control group design. The area of study was North Central States of Nigeria. A total of 65 SS II students, comprising 35 males and 30 females, took part in the study. Two research questions and two hypotheses tested at 0.05 level of significance guided the study. Building Construction Achievement and Retention Test (BCART) was developed, validated, pilot tested and used for the study. The reliability coefficient of BCART was determined using K-R 20 and was found to be 0.81, the mean was used to answer the research questions, while analysis of covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance the findings of this study, revealed that the experimental group had higher mean gain than the control group on students taught building construction using e-content instructional strategy and those taught using conventional lecture method In addition, e-content instructional strategy happens to be more effective for enhancing retention ability of unity college students in Building construction than conventional lecture method. More so, e-content instructional strategy and conventional lecture method was not sensitive to gender in improving students' academic achievement and retention ability in Building construction respectively. Therefore, it was concluded that irrespective and retention of gender, e-content instructional strategy is more effective for improving academic achievement of Unity college students in Building construction than conventional lecture method The male students had higher mean gain than female students on building construction using e-content instructional strategy, The male students had higher mean retention score than female students on building construction using e-content instructional strategy, method, There was no significant difference between the mean achievement scores and retention scores of male and female students taught Building Construction using e-content instructional strategy.

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Keywords: E-Content Instructional Strategy; Academic Achievement; Retention; Building Construction

Introduction

The role of Educational technology is indispensable for improving the education quality and quantity in Nigeria. Nowadays, many pedagogical methods and modules are used in the classroom for providing optimum learning experiences to students. The role of teachers is changing authoritarians into facilitators in classroom teaching by using the modern teaching – learning methods of educational technology. Moreover, e-content provides rich learning experiences to students with the mentoring of teachers. The e-content is a collaboration of motivating strategy, teaching strategy, content strategy and also evaluating the strategy. Objective of the article was to find out the e-content strategy is enhancing the students' retention ability through e-content strategy of learning when compared to chalk and talk method teaching.

Recognizing this importance, Federal Republic of Nigeria (FRN, 2013) in the National Policy on Education emphasized that modern technology aids need to be used to improve the process of teaching and learning at all levels of education and to improve the learning environment of the institution. With the spread of virtual technology, online instruction is gaining acceptance as an alternative to traditional classroom setting. Advances in information and communication technologies have fueled rapid growth in the popularity of technology-supported learning. The internet has become impossible to ignore and even people who do not own a computer have seen or heard about its uses or "surf the net." Education becomes accessible even outside the formal schools. Anyone can acquire information, knowledge with the use of virtual technology anytime even at early hours of the day (Salve-Opina, 2014).

The use of computers in education has enabled the students to experience the vast field of knowledge, which the older generation, perhaps, may no longer see. Schools have built on the gains of computer industry. This shows that computers are here to stay; and education will then shift to an inter-disciplinary, intercultural, and world-class approach. Against this background of importance and necessity, the researcher has chosen the technology of e-content as instructional strategy and assessment of its effectiveness in teaching building construction in unity colleges in North Central Nigeria. Conventional method of teaching has not significantly helped the students in easy understanding, retaining and uniform pace of learning especially in vocational and technical subjects of which Building Construction is inclusive.

Building Construction (BC) is one of the vocational subjects offered at senior secondary school level of Nigerian system of education. The objectives of BC according to National policy on education Federal Government of Nigeria (FGN) 2014, is to help students: develop the needed

knowledge and skills for the BC trade and related professions, appreciate the use of local materials for building construction, develop respect for the abilities of the craftsman in the building industry, identify, investigate, analyse and provide solution for constructional problems, observe safety precautions and safe practices, appreciate the need for maintenance, develop the sense of morality and trustworthiness in the use of materials and other input resources supplied for projects

To achieve these objectives afore mentioned, it further implies that BC students must be exposed to adequate training in the area of the content. The need to expose the students to proper training calls for qualified teachers and quality instructional materials and resources in BC at senior secondary school (SSS) level. The Building Construction will help students to develop positive attitudes toward the use of the hand and equip students with more knowledge; skills and processes to enable them fit into middle level manpower positions in the Building and allied Industries. The programme has been designed in such a way that cater for the needs of students who wish to further their education as well as those who wish to exit the school system after Senior Secondary School three level. For students who wish to go on to higher levels of education and training in the University, Polytechnics and Colleges of Education and Technology, the course provides adequate knowledge and skills for success at such levels. Students who wish to terminate their course at SSS3 level would have acquired adequate skills and knowledge of materials, processes and procedures for building and construction; i.e. at substructure, super-structure, roof construction and provision of building services, fittings and fixtures and finishes to enable them get into employment. However the attainment of these objectives has been hampered by poor performance of students in BC at external examination conducted by NECO and WAEC.(waec examiner's report 2018).

The dominant instructional strategies used in teaching vocational and technical subject are based on behavioral theory which is not student centered. This has led to poor academic achievement, low interest and poor retentions of students in building construction as a result of this inappropriate teaching strategy (Owodunni, 2011). The shortcoming in this teacher-centered way of teaching could be responsible for the poor academic achievement of building construction students in both internal and public examination (Owodunni, 2011). There is need for a change of strategies in the way building construction is taught in our Unity Colleges senior secondary to enhance student achievement and retention in the subject and one of the strategies that can be used to effect this change is e-content learning strategy.

Electronic learning or e-content is the use of technology to aid, enhance and enrich learning (Anurag 2011) It complements traditional learning and it places the learner in the centre instead of the educator. It is dynamic, empowering, comprehensive, effective quick and operates in real time. It allows the learner to interact with the e-

material for maximum retention of knowledge. Anurag further explains some of the possible methods of educational e-contents conversions as: (i) learning by doing and learning by investigation; (ii) learning by using themes; (iii) learning by testing / evaluation;

E-content is generally designed to guide students through a learning of information in a specific task. (Tekin, and Polat, 2016). They further stated that e-content package can be used as a teacher in the virtual classroom situations. The quality of learning depends not only on the form of how the process is carried out but also on what content is taught and how the content is presented. This approach of teaching has become an answer to the complicated problems and un-identified areas. In a class room, technology stimulates the learner and gets the learner involved in the learning. Books are an extension of brain; video is an extension of eye; audio is the extension of an ear; audio conferencing is the extension of mind and vocal cord; computer is an extension of fusion of mind, hands and eyes; satellite technology is an extension of human reach and computer network is an extension of human co-operation. E-content is valuable to the students and also helpful to teachers for all individual instruction systems. Tekin and Polat (2016) further stated that e-content is the latest method of instruction that has attracted more attention of people or scholars with different concepts. The ultimate aim of the e-content is to abolish the disparity among the learners through effective education. It enhances the learner knowledge level which leads to creative thinking and it gives the future ideas on the basis of given links, and references. E-content comprises all forms of electronically supported learning and teaching. The Information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. It may be classified as Online and Offline. The online learning occurred through, e-forum, SMS / MMS, Search engines, Meta search engines, e-dictionaries, e-books and e-journals.

Cheal (2009) pointed out that any instructional technology course should contain the following information: a) Course objective(s); b) Course requirements, methods of evaluation and Contact information of instructor (instructor's name, office hours, office location, campus phone number, and email address); c) Schedules and directions on how long the instructor will take to answer email. The e-content can also be used to reduce some of the challenges facing the training of students in Vocational and Technology subjects in Unity colleges in Nigeria, and overcome the challenges of: low enrollments, inadequate and obsolete physical facilities and infrastructure at all levels; inadequate qualified teaching staff at all levels; inadequate teaching and learning materials and equipment at all levels; curriculum not demand driven; inadequate capacity in governance, management, monitoring and evaluation; inadequate capacity of the existing education system to address cross cutting issues; inadequate linkages and synergies within the education sector and the overall inadequate funding of

education programmes (Uwaifo, 2010; Umoru and Okeke, 2012). Though there are packages developed and available for many educational topics, personal development of one especially in building construction for the specific purpose is desirable. An effective use of e-content instructional strategies may lead to an enhanced achievement and retention of students in BC.

Academic achievement refers to intellectual ability and skills attained by a student in a particular subject, measured by a score obtained in an achievement test (Ali in Orjika 2012). Also academic achievement can be defined as excellence in all academic disciplines in class as well as extracurricular activities measurable by a test. It implies performance in school subject as represented by a score on an achievement test. An achievement test is an instrument administered to a learner to draw out the desired and expected responses, as demanded in the instrument, performance on which the individual is assigned a score representing his/her achievement (Olaitan, Ali, Eyo and Sowander 2007). They noted that academic achievement is always denoted by a score, which is a representation of the amount of learning acquired, knowledge gained or skills and competence developed in that particular subject.

Gender refers to state of being male or female. For a long time, gender was listed by researchers as one of the factors that influenced the academic achievement of the child (Gupta, Sharma and Gupta, 2012; Abubakar and Oguguo, 2011). Hence, there has been a lot of debate on whether gender really effect academic achievement. Some researchers believed that boys often out-perform their girls counterparts in most subject areas, while some conclude the other way round (Maliki, Ngban and Ibu, 2009; Jabor, Machtmes, Kungu, Buntat, and Nordin, 2011). But current trends show that the gap that once existed between genders is fast closing (Abubakar and Bada, 2012). This suggests that women are getting more exposure to educational activities more than ever.

Retention of learned information can be defined as having the information stored in long term memory in such a way that it can be readily retrieved. Retention is the degree to which new experience can be held in the memory and reproduced as at when required. Hafeez and Aamir (2013) posit that memory retention and recall are interrelated processes to one another and also to factors such as learning, testing, and capacity limit of memory, attention demand, and complexity of material. The role of retention is to store encoded events, experience and information so that they can be re-accessed in response to external stimuli (Hafeez andAamir, 2014). Similarly, Studies by Gokalp, (2013) and Inal, (2013) indicate that there is a significance increase in the level of retention of students when they receive instruction in a classroom atmosphere according to learning strategies. However, some studies show no significant increase in the level of retention of students (Jahanbakhsh, 2012; and Onder, 2012). Likewise, Orlu, (2013) submits that the effectiveness of any learning is influenced by the individual learners'

learning strategy, and if teaching is done with regard to the students learning strategy, retention can be greatly achieved irrespective of ability level and gender. As a matter of fact, Taiwo (n.d.) identified low memory retention as one of the causes of students' failure in examinations. Often times, students find it frustrating whenever they are unable to recall or remember some important information required for answering examination questions. Suffice to say that a retentive memory is an asset to every student. Thus forgetting is students' worst enemy because all the hours and efforts put into studying and preparing for an examination are wasted if he/she cannot remember the points needed in the examination hall.

Academic achievement and retention has been understudied in relation to gender. Gender is the physical and behavioural difference that distinguishes individuals according to their functions in the reproductive process as male or female. The effect of gender on retention and academic achievement has been investigated by a number of studies with widely differing/varying conclusions. According to Umunadi (2015), male students are better skilled than their female counterparts in certain disciplines such as physical sciences and industrial technology, while female students outperform their male counterparts in other areas like home economics, languages, and business studies. However, Fatokun and Adeniji (2015) established that no significant difference exist between male and female students in achievement and retention when taught in a way that favours their learning styles.

Aibina (2018) carried out a study focused on the effectiveness of e-content in teaching of Mathematics education among B.Ed. student-teachers. The finding revealed that E-content in the Teaching of Mathematics Education has provided higher achievement among B.Ed. student-teachers. Also, a study undertaken by Gershom, Jebaraj and Mohanasundaran, (2016) to find out the effectiveness of e-content method of teaching over the conventional lecture method in teaching Physics to Engineering Students . The results from the study reveal that, e-content method of teaching is more effective in teaching Physics to Engineering Students than the conventional lecture method. The use of e-content will create avenues of learning where students can get the knowledge that will be more relevant in this age of digital revolution. Hence the need to determine the effect of E-content on achievement and retention of students in Building Construction

Statement of the Problem

There are a number of challenges facing Technical education sector at secondary school level, these are: low enrollments, inadequate and obsolete physical facilities and infrastructure; inadequate qualified teaching staff; inadequate teaching and learning materials and equipment; inadequate capacity of the existing education system to address cross cutting issues; inadequate linkages and synergies within the education sector and the overall inadequate funding of education programmes (Uwaifo, 2010;

Umoru & Okeke, 2012). The number of students studying technical and vocational subjects in unity colleges is not encouraging. With this low enrollment of students especially in building construction, the need to stimulate students' interest, and increase enrollment through the adoption of an efficient and effective lesson delivery technique is inevitable.

The overall achievement of students in Building Construction in Unity Colleges has been abysmally low and not encouraging. For instance, a critical look at the statistics of students' achievement in Building Construction WASSCE record in Unity Colleges in the North Central Nigeria from 2017 – 2021 shows that achievement of the students was poor. The poor achievement is indicated more by percentage failure of Building Construction students in the North Central Mock Examination for the years 2017, 2018, 2019, 2020 and 2021 which are 43%, 39.21%, 36.67 %, 41.6% and 42.28% respectively (Student results from the North Central unity Colleges results 2017-2021). The poor performance indicated in the students' results has been attributed to various reasons, which include poor provision of instructional materials, poor teaching strategies, and lack of appropriate and effective use of media, unqualified teaching staff and gender. However, the dominant instructional strategies used in teaching Vocational and Technical Education include the conventional lecture method, note taking, discussion and field trip methods. Despite the use of all these instructional strategies, the problem of poor academic achievement, low interest and poor retentions of students in Building Construction still persists. The shortcoming in this teacher-centred method of teaching could be responsible for the poor academic achievement of building construction students in both internal and public examination. Therefore, there is need for change of strategies in the teaching of building construction, so as to enable Unity Colleges secondary school graduates of BC acquire adequate knowledge and skill for the world of work, and further their education in higher institutions. Thus, the problem of this study is: to establish if e-content instructional strategy in teaching BC at unity Colleges senior secondary schools would enhance students achievement and retention in the subject

Research Questions

The following research questions guided the study

1. What is the difference between the mean achievement scores of male and female students taught building construction using e-content instructional strategy
2. What is the difference between the mean retention scores of male and female students taught building construction using e-content instructional strategy?

Hypotheses

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

1. There is no significant difference between the mean achievement

scores of male and female students taught Building Construction using e-content instructional strategy

2. There is no significance difference between the mean retention scores of male and female students taught Building Construction using e-content instructional strategy

Research Design

This study was conducted using the quasi-experimental research design; specifically the pre-test, post-test, non-equivalent control group design was adopted for the study. This implies that, intact classes (non-randomized groups) were used for the study. According to Sambo (2005) quasi-experimental research design permits the use of intact classes. Also Nwankwo (2007) define quasi- experimental study as "a study in which some threats to validity cannot be properly controlled because of unavoidable situations associated with the study when human beings are used for experimental study. Quasi-experimental research design is adopted because it was not possible for the researcher to randomly sample the subject and assign them to groups without disrupting the academic programme and the time table of the schools involved in the study. Hence the design is considered quite suitable for conducting the study.

Population and sample of the study

The population of the study comprised 106 senior secondary school two students (SS2) offering Building Construction in all the Unity colleges during 2022/2023 academic session in North Central states of Nigeria. The reason for choosing SS2 classes was that the students have undergone the curriculum of Building Construction Works during their first year in their respective colleges; they are already familiar with some of the course content and also not preparing for any external examination. Also the major aspect of building construction is in SS2 scheme of work. The population of 106 SS2 students offering Building Construction students was obtained from the 2020/2021 session registered of all the colleges offering Building Construction in the area. (See appendix A page 129) The sample was made up of 65 (35 males and 30 females) SS II Building Construction students. A purposive sampling technique was used to select the colleges from the target population. A purposive sampling technique is a sampling technique in which specific elements which satisfy predetermined criteria are selected (Nworgu, 2006). The criteria which a Unity College must meet for it to be selected were: 1. Unity Colleges that have at least one graduate of Building Construction teacher with at least two years of teaching experience. 2. Unity Colleges that have well equipped and functional Computer laboratory. 3. Unity Colleges that are currently presenting candidates for Senior Secondary School Certificate Examination (SSCE). 4. Unity Colleges whose Building Construction students are not less than 10 (ten). From the purposive sampling that was carried out, only five colleges met the criteria, and these five colleges are Federal Government College Keffi, Federal

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Government Girls College Abaji,. Federal Government Girls College, Bwari. Federal Government Boys College, Garki Abuja and Federal Government College, Minna (see appendix B page .130) Out of these five colleges selected for the study, three colleges were randomly assigned to Experimental Group and the other two were assigned to control Group. The five colleges used for the study and their groups are presented in (appendix B, page 130)

Instrument for Data Collection

Building Construction Achievement and Retention Test (BCART). Was used for the study. The items of the BCART instrument developed by the researcher touches all the topics covered in SS2 syllabus on all the related topics. Similarly, the BCART which was made up of 40 multiple choice test items was used for the pre-test, post-test and retention test. Each item of the instrument had four answers with options lettered A – D where only one of the options bears the correct answer (according to WASSE standard questions). The BCART was based on selected topics such as: Excavation of soil, Foundation, Ground floor, and Materials for Concreting. In constructing BCART, the researcher prepared a table of specification (test blue print) to guide the test development, in accordance with WASSE curriculum which contains the cognitive learning outcome of the items of the test. These included knowledge, comprehension, application, analysis, synthesis and evaluation (see appendix C, pg 131). These items were re-arranged to assess student's achievement and retention in the BC topics both in post-testing and delay test.

Research Question One: What is the difference between the mean achievement scores of male and female students taught building construction using e-content instructional strategy?

To answer research question three, mean and standard deviation was used to analyse the post-test and retention scores of students as shown in Table 1

Table 1: Mean and Standard Deviation of Pre-test and Post-test Scores of students taught building construction using e-content instructional strategy

Gender	N	Pre-test		Post-test		
		Mean	SD	Mean	SD	Mean Gain
Male	17	15.79	2.23	39.12	3.54	23.33
Female	17	16.79	2.18	38.41	3.27	21.62

Table 1 shows the mean and standard deviation of pre-test and post-test scores of male and female students taught building construction using e-content instructional strategy. Male students had achievement mean score of 15.79 with a standard

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deviation of 2.23 at the pre-test and a mean achievement score of 39.12 with a standard deviation of 3.54 at post-test while their female counterparts had achievement mean score of 16.79 with a standard deviation of 2.18 at pre-test and a mean achievement score of 38.41 with a standard deviation of 3.27 at post-test. Mean gain scores of 23.33 and 21.62 for the male and female students respectively. The result indicates that male students achieved higher than their female counter parts.

Research Question Two: What is the difference between the mean retention scores of male and female students taught building construction using e-content instructional strategy?

To answer research question four, mean and standard deviation was used to analyse the post-test and delay post-test scores of students as shown in Table 2

Table 2: Mean and Standard Deviation of Post-test and Delay posttest Scores of Male and Female Students Taught Building Construction using E-Content Instructional Strategy

		Post-test		Delay posttest		
Gender	**N**	**Mean**	**SD**	**Mean**	**SD**	**Mean difference**
Male	17	39.12	3.54	22.55	3.26	16.57
Female	17	38.41	3.27	21.89	3.13	16.52

Table 2 shows the mean and standard deviation of post-test and retention scores of male and female students taught building construction using e-content instructional strategy. At the post-test male students had retention mean score of 39.12 with a standard deviation of 2.23 while the female students had retention mean score of 38.41 with a standard deviation of 3.27 respectively. At delay post-test the male students had mean score of 22.55 with a standard deviation of 3.26 while the female students had mean score of 21.89 with a standard deviation of 3.13 respectively. The mean difference of the experimental group and control group are 17.54 and 14.23 respectively. The result indicates that male students had the highest retention in building construction using e-content instructional strategy than their female counter part.

Hypothesis One: There is no significant difference between the mean achievement scores of male and female students taught Building Construction using e-content instructional strategy. The result is presented in Table 3

Table 3: ANCOVA summary of mean achievement scores of male and female students taught Building Construction using e-content instructional strategy

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Source	Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	778.010[a]	4	194.503	17.786	.000
Intercept	96.661	1	96.661	8.839	.004
Pretest	15.349	1	15.349	1.312	.255
Gender	43.008	1	43.008	1.775	.191
Error	1323.488	31	24.508		
Total	345221.000	34			
Corrected Total	2871.562	33			

***Significant at sig of F< .05**

The result in Table 3 shows the ANCOVA summary of mean achievement scores of male and female students taught Building Construction using e-content instructional strategy. The result revealed that the F-ratio of 1.775 with 1 degree of freedom and p-value of 0.191 was obtained for mean achievement scores of male and female students taught Building Construction using e-content instructional strategy, since the p-value of 0.191 is greater than 0.05 level of significance. This indicate that there was no significant difference between the mean achievement scores of male and female students taught Building Construction using e-content instructional strategy. The null hypothesis is therefore accepted.

Hypothesis two: There is no significant difference between the retention scores of male and female students taught Building Construction using e-content instructional strategy.
The result is presented in Table 4

Table 4: ANCOVA summary of retention scores of male and female students taught Building Construction using e-content instructional strategy

Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	992.311[a]	4	248.078	47.871	.000
Intercept	1706.006	1	1706.006	329.203	.000
Posttest	38.478	1	38.478	.671	.415
Gender	.026	1	.026	.002*	.0984
Error	3163.927	31	65.915		
Total	294227.000	34			
Corrected Total	2510.733	33			

*Significant at sig of F< .05

The result in Table 4 shows the ANCOVA summary of retention scores of male and female students taught Building Construction using e-content instructional strategy. The result revealed that the F-ratio of 0.002 with 1 degree of freedom and p-

value of 0.984 was obtained for retention scores of male and female students taught Building Construction using e-content instructional strategy, since the p-value of 0.984 is greater than 0.05 level of significance. This indicate that there was no significant difference between the retention score of male and female students taught Building Construction using e-content instructional strategy. The null hypothesis is therefore accepted.

Discussion of Results

The result obtained in research question one on the difference between the mean achievement scores of male and female students taught building construction using e-content instructional strategy; it revealed that male students had higher mean gain than female students on building construction using e-content instructional strategy. The findings agreed with Iroegbu (2013) who confirmed that males performed better than females. Jegede and Inyang (1990) also affirmed that males demonstrated significantly more positive attitudes towards science than their female counterparts.

The result obtained in hypothesis one revealed that there was no significant difference between the mean achievement scores of male and female students taught Building Construction using e-content instructional strategy. The findings coincide with Vasuki*et al.* (2014) they carried out a research on Development and Validation of E-Content on French Revolution at Secondary Level As 20 M.Ed students of the Department of Educational Technology, Bharathidasan University, Tamil Nadu, India was used as sample for the purpose of evaluating the e-Content. The result revealed that there is no significant difference between the mean scores of male and female with regard to the effectiveness of the e-content. The findings was also supported by Yusuf and Afolabi (2010), they carried out a study on the effects of Computer Assisted Instruction CAI on secondary school students' performance in Biology in Nigeria. The result revealed that the gender had no influence on the performance of students in biology whether they were taught with IT in individualized or cooperative setting.

The result obtained in research question two on difference between the mean retention scores of male and female students taught building construction using e-content instructional strategy. The result revealed that male students had higher mean retention score than female students on building construction using e-content instructional strategy. The findings of the study agreed with Dawodu (2013), who carried out a study designed to determine the effect of computer assisted instruction on technical college students' academic achievement, interest and retention in metalwork technology. He found out that male students have higher retention score than female students.

The result obtained on hypothesis two revealed that there was no significant difference between the retention scores of male and female students taught Building Construction using e-content instructional strategy. The findings contrast with Fakomogba *et al.*, (2014) carried out a study

titled "effect of computer assisted instructional package on the performance of students in Mathematics in Ilorin Metropolis. The study found out that there was a significant difference in the Mathematics mean retention score of students taught with the Computer Assisted Instruction than those with conventional method.

Conclusion

Based on the findings of this study, which revealed that the experimental group had higher mean gain than the control group on students taught building construction using e-content instructional strategy and those taught using conventional lecture method., it was concluded that e-content instructional strategy is more effective than conventional lecture method in improving academic achievement of unity college students in Building construction. In addition, e-content instructional strategy happens to be more effective for enhancing retention ability of unity college students in Building construction than conventional lecture method because unity college students taught Building construction using e-content instructional strategy had a higher mean gain than their counterparts.

More so, e-content instructional strategy and conventional lecture method was not sensitive to gender in improving students' academic achievement and retention ability in Building construction respectively. Therefore, it was concluded that irrespective of gender, e-content instructional strategy is more effective for improving academic achievement of Unity college students in Building construction than conventional lecture method.

Recommendations

1. Government and other stake holders in unity colleges should sensitize unity college teachers on the efficacy of e-content instructional strategy through conferences, seminars and workshops.
2. Supervisory agency for schools in the State should lay more emphasis in the use of e-content instructional strategy in building construction curriculum.
3. Curriculum planners of unity college programmes should collaborate with Building construction experts to develop a workable building construction curriculum that will accommodate teachers' integrating collaboration in e-content instructional strategy.

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