

THE USE OF ARCHICAD SOFTWARE PROGRAM AND ITS EFFECTS ON STUDENTS ACADEMIC PERFORMANCE IN BUILDING DRAWING IN GOVERNMENT TECHNICAL COLLEGE, AHOADA, RIVERS STATE.

ORUABENA BERNARD

School of Engineering Technology,
Department of Civil Engineering,
Federal Polytechnic, Ekowe,
Nigeria.

EMELI, ENIEKENEMI

Department of Mechanical Engineering,
Federal Polytechnic, Ekowe,
Nigeria.

UDOH BLESSING CHIDIEBERE

Department of Civil Engineering,
Federal Polytechnic, Ekowe,
Nigeria.

ABSTRACT

The study focused on the use of ArchiCAD software program and its effects on students academic performance in building drawing in Government Technical college, Ahoada, Rivers State. Three research questions were used for the study. Post – test only control group experimental design was adopted. Random sampling technique was used to assign students to experimental group E which consist of 15 male students and 6 female students. The control group consist of 16 male students and 5 female students. All the students are from class three in Government technical college, Ahoada. Rivers State. The ATI instrument was developed from lesson plan designed using building drawing recommended textbook by NABTEB. Pearson product moments correlation coefficient was used to calculate the reliability coefficient to be 0.83. The post test instrument consists of 12 test objective questions validated by experts from building technology in Government technical college, Port Harcourt. From the result obtained in table1, it revealed that students taught building drawing with ArchiCAD performed better than those taught with the conventional method. Table 2 reflected that male students performed better in building drawing using ArchiCAD compared to their counterpart taught with conventional method. Table 3 reveal that female students taught building drawing with ArchiCAD performed better than the male students taught with the same method. Finally it was recommended that teachers should be trained on the use of ArchiCAD in teaching building drawings. Also, ArchiCAD should be included in building drawing curriculum in Technical and vocational institutions.

Keywords: ArchiCAD, performances, achievement, building drawing, and software.

INTRODUCTION

Human learning is a very complex process. In spite of years of research in education, our understanding of how humans learn is still limited. For this reason, educators strive to use the little that is known about human learning wherever they engage in the act of teaching and learning. When using technology as teaching aid, the focus is on developing ICT literary skill. There are two types of ICT literary skill sets. The first is generic ICT literary skill such as keyboarding, word processing using data bases, using spreadsheets, desktop publishing and using the internet research and communication (Kasworm and Londoner, 2000). In this network economy every graduate from vocational education programmes need to process these essential and generic ICT literary skills. Example of these skills includes the ability to work with CAD/CAM, and operate equipment with digital system controls.

The evolution and development of ICTs has resulted in a paradigm shift in the educational system. ICTS are changing the way people learn, offering new alternatives to the traditional classroom. In this new era, it is essential for learners to have access to education with technology. In a classroom environment, some learners may learn better by visual means while others are going to learn with hands – on approach. Since the traditional classroom environment cannot satisfy all these needs at a time, it is common for students to get bored and frustrate (Michael, 2009). Damodharan (2006) pointed out that technology in classroom using chalk and talk is a “One- way flow” of information. Teachers often continuously talks for an hour without knowing students’ response and feedback. In other to make learning meaningful and attractive, computer programs are been introduced to aid teaching and learning process in the classroom. Some of the common computer programmes used in engineering classes are Auto CAD, ArichiCAD, PDMS, etc, one common programme used in teaching and learning of building construction is the ArchiCAD.

ArchiCAD is an architectural BIM CAD software for macintosh and windows developed by the Hungarian company Graphisoft. Development of ArchiCAD started in 1982 for the original apple macintosh. Following its launch in 1987, with graphisofts virtual Building “concept” ArchiCAD became regarded by some as the first implementation of building information modelling (BIM). ArchiCAD has been recognized as the first CAD product on personal computer able to erate both 2D and 3D geometry, as well as the first commercial BIM produced for personal computer (Graphisoft, 2015).

Two dimensional software drawing tools are used to create accurate and detailed technical drawing. The 3 Dimensional interfaces especially developed for architects are capable of creating various kinds of building forms, ArchiCAD allows the user to work with either 2D or 3D representation on the screen. Two dimensional drawings can be exported at any time, even though the model in the programme is data base always stores data in three dimensions plans, elevations, and sections are generated from the three dimensional visual building model and are constantly updated if the user rebuilds the view.

Observation shows that students in Government technical schools learn building drawing using the chalkboard method. Amechi (2006) stated that students approach the subject with plobia. This may be as a result of teaching method used. This is therefore the need to introduce a new teaching method like the use of ArchiCAD to see if the learning of building drawing by the students will be easy and interesting.

PURPOSE OF STUDY

The aim of this study is to determine the effect of ArchiCAD software in teaching building drawing in Government Technical College, Ahoada, Rivers State. Specifically, the study sought to determine:

1. The differences in post-test mean achievement scores of students taught building drawing using ArchiCAD and those taught with the conventional method.
2. The difference in post test mean achievement scores of male students taught building drawing using ArchiCAD and male students taught building drawing with the conventional method.
3. The different in post-test mean achievement scores of male and female students taught building drawing with ArchiCAD.

RESEARCH QUESTIONS

The following research questions guided the study:

1. What are the differences in post-test mean achievement scores of students taught building drawing using ArchiCAD and those taught with the conventional method?
2. What are the differences in post test mean achievement scores of male students taught building drawing using ArchiCAD and male students taught building drawing with the conventional method?
3. What are the differences in post-test mean achievement scores of male and female students taught building drawing with ArchiCAD?

METHODOLOGY.

RESEARCH DESIGN.

The researcher adopted the post – test only control group designed. The students are randomly assigned to group E and group C. Group E students are the experimental group that are taught building drawing with ArchiCAD. Group C students are the control group that are taught with the conventional method of building drawing. The students already have previous knowledge on building drawing. Post – test was given to the experimental group and control group. Randomised post-test control group designed is shown below:

Treatment R x_1 O_1

Comparison R O_1

R - Random assignment for group E and C

X - Treatment occurs for X_1 (Experimental group) only

O_1 – Post-test observation for both experimental and control group.

SAMPLING TECHNIQUE

Random sampling technique was used to assign students to group E and C. Group E are made up of 15 male and 6 female students. Group C consist of 16 male and 5 female students. They are both students from Government technical College, Ahoada, Rivers State. They are all year 3 students from the school.

INSTRUMENT FOR DATA COLLECTION

The ArchiCAD Test Instrument (ATI) was used in the study. The ATI items were developed from lesson plan designed using the content in building drawing on recommended text book by NABTED. Topics treated are identification of building symbols, simple blue print reading, stair case design, etc. The ATI items consist of twelve test multi – choice question. The ATI items were validated by two experts from the department of building technology in Government technical College, Port Harcourt. Using Pearson product moment correlation coefficient, the reliability of the instrument was calculated to be 0.83. which was considered adequate for the study.

EXPERIMENTAL PROCEDURES

The researcher observed the following procedures during the treatment;

1. The researcher trained regular technical drawing teacher as research assistant from the school. This was done after taking permission from the school authority.
2. The technical drawing teacher was trained on how to use the ArchiCAD in teaching building drawing.
3. The research assistant was given lesson plan to teach building drawing using ArchiCAD. The treatment was given to the experimental group for a period of two weeks using the regular school time table. The researcher brief the research assistant to following the lesson plan strictly.
4. At the end of the treatment, post-test was administered to experimental group E and control group C. Their scores were collected and recorded. The scores obtained from the objective questions were converted to percentage.

METHOD OF DATA ANALYSIS

Mean and standard deviation were used to answer the research questions.

RESULTS

TABLE 1: The difference in post-test mean achievement scores and standard deviation of students taught building drawing using ArchiCAD and those taught with the conventional method.

GROUP	N	POST- TEST MEAN	STANDARD DEVIATION (SD)	DIFFERENCE IN MEAN
Experimental group	21	70.1	15.1	29
Control group	21	41.1	7.3	
TOTAL	42	111.2	32.4	

TABLE 2: the difference in post –test mean achievement scores of male students taught building drawing using ArchiCAD and male students taught using conventional method.

GROUP	N	POST-TEST MEAN	STANDARD DEVIATION (SD)	DIFFERENCE IN MEAN
Experimental group	15	69.6	14.9	26.6
Control group	16	43.0	17.5	
TOTAL	31	112.6	32.4	

TABLE 3: The difference in post-test mean achievement scores of male and female students taught building drawing with ArchiCAD.

GROUP	N	POST-TEST MEAN	STANDARD DEVIATION (SD)	DIFFERENCES IN MEAN
Male students taught with ArchiCAD	15	69.6	14.9	1.7
Female students taught with ArchiCAD	6	71.3	17.4	
TOTAL	21	140.9	22.3	

DISCUSSION

The result from 1 revealed that students taught building drawing with ArchiCAD achieved higher than those taught with the conventional method with a mean difference of 29. These may be that the ArchiCAD may have influenced the scores. Table 2, revealed that male students taught building drawing with ArchiCAD performed better than male students taught with the conventional method showing a mean difference of 26.6. the present of the ArchiCAD in the teaching process may have created a better learning environment. Kaboridis (2010) stated that the explosion of ICT has presented the academic society with the opportunity to support and nurture students creativities and deep learning. The use of ArchiCAD software may have influence the creativity in students to perform better.

The finding of table 3, reveal that the post-test scores of female students taught building drawing with ArchiCAD performed better than the male students taught with the same method. This showed that ICT is not gender dependent. Abdullahi (1982), stated that gender did not influence students performance in science generally.

CONCLUSION

Base on findings of the study, the result showed that the use of ArchiCAD is highly effective on student’s performance in building drawing. Male students learning building drawing with ArchiCAD achieved higher than those taught with conventional method. Also, female students learning building drawing with ArchiCAD, achieved higher than male counterpart. This goes a long way to show that the present of use of ArchiCAD in learning building drawing is highly effective on student’s academic achievement.

RECOMENDATIONS

The following recommendation were made base on the finding of the study:

1. Technical and vocational school should train teachers on the use of ArchiCAD in teaching building drawing.
2. ArchiCAD should be included as part of the teaching technique in NABTED curriculum for learning building drawing.
3. Education Authorities should put in place policy that will enforce the provision of ICT facilities and use of ArchiCAD in classroom teaching of building drawing.

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