

## **Effect of Autocad Software In Teaching Isometric And Oblique Drawing Among Female Students In Federal Science Technical College Tungbo, Bayelsa State**

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### **Abstract**

*The study looked into the effect of Autocad software in teaching isometric and oblique drawing among female students in Federal Science Technical College Tumbgo, Bayelsa State. Two research questions were used for the study. The post-test only control group experimental design was used. A population of 10 SS1 Student was used as sample for the study. They were assigned to E group and C. group E was used as experimental group, while group C was used as control group. The study was conducted in Sagbama Local Government area of Bayelsa State. Isometric and Oblique achievement test (IOAT) and students interest scale (SIS) was used as instrument for the study. Two lecturers from Rives State University of Science and Technology, Port Harcourt validated the instruments. Pearson product moment correlation coefficient was used to calculate the reliability of the instrument to be 0.93 for the IOAT items and 0.82 for SIS items using Cronbach Alpha method. Post-test was used to determine the mean difference among the groups and simple percentages was used to determine the interest level of the students. From the result of the analysis, it was observed that student taught isometric and oblique drawing with Autocad perform better than those taught with conventional lecture method. Also female students taught Autocad technique had high level of interest in isometric and oblique drawing. Finally it was recommended that teachers in secondary institution should be trained on the use of Autocad in Teaching Drawing.*

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### **Introduction**

Technical drawing is the bases on which all Engineer courses and practices are laid. Technical drawing is defined as a graphical representation of figures by Engineers, Technicians, artisans, draughtsman and students for effective communication in the industrial sector. Khairu, (2004) define technical drawing as drawing from which equipments and structures are laid to be made for the aim of achieving great exactitude of representation and a different sort of delineation from the artist's work. Topics like geometric construction, link mechanisms, projections, surface developments, intersections, mechanical during etc are all treated in technical drawing.

Isometric and oblique projections are 3-dimensional (3D) topics in projects that deals with the construction of solid shapes. Objects constructed in oblique drawing are sketched at  $45^{\circ}$  and  $90^{\circ}$ . While object in isometric form are constructed at  $30^{\circ}$  and  $90^{\circ}$ . Isometric and oblique drawing can be taught using the conventional method and AutoCAD technique.

Mark (2004) stated that conventional method of technical drawing involve the use of drawing instruments in the class. Mark further stated that both males and female counterpart often experience difficulty in learning technical drawing using the conventional method. Thus making students to fail and shy away from the subject. Ameachi (2003) stated that students, approach technical drawing with phobia. According to this author, they see it as difficult and complex and often shy away from it.

It is based on this that ICT teaching aids are introduced to classroom to improve student's performance in the subject. A common ICT technique used in the teaching and learning of technical drawing is the AutoCAD.

The automatic computer aided design programme popularly known as AutoCAD has the ability to create effective means of instruction, develop spatial reasoning, reducing the stress level in the students and removing learning phobia among student. Jones (1993) stated that AutoCAD was first released on December 1982; AutoCAD was one of the first CAD programs to run on personal computers. This software has the application for 2-D and 3-D design and drafting. CAD design and CAD drafting services are very essential for various engineering sectors like electrical design, mechanical design and product design, building design, architectural rendering and design.

Therefore, this paper will want to find out the effect of AutoCAD software in teaching Isometric and oblique drawing among female students in federal science Technical College, Tungbo, Bayelsa State.

### **Statement of the Problem**

Female students learning traditional method of technical drawing are faced with more difficult problems in spatial reasoning ability (Robert, 1997). The problem of the use of traditional drawing instruments in analyzing three dimensional (3-D) objects is another setback experienced by the female students (OIkun, 2003). Achievement test conducted by Henry and parker (2007) revealed that the sudden withdrawal of female students in technical drawing has attributed to the stressful nature of the subject and low academic performance. The problem of the study is that female students learning technical drawing are not performing well in the subject due to the teaching method.

There is therefore the need to introduce the AutoCAD teaching technique to see if student performance can improve.

### **Purpose of The Study**

The purpose of the study is to;

Ascertain the effect of use of AutoCAD software in teaching Isometric and oblique drawing among female students in Federal Science Technical College, Tungbo, Bayelsa State.

Determine the interest level of female students when learning AutoCAD with isometric and oblique drawing in Federal Science Technical College, Tungbo, Bayelsa State.

### **Research Questions**

The following research question guided the study;

1. What is the effect of AutoCAD software in teaching isometric and oblique drawing on female students mean achievement scores in Federal Science Technical College, Tungbo, Bayelsa State?
2. What is the effect of AutoCAD software on female student interest in learning Isometric and oblique drawing in Federal Science Technical College, Tungbo, Bayelsa State?

### **Research Design**

This study used the post-test only control group experimental design. The students are assigned randomly to group E and group C. Where group E is experimental group and groups C is the control group. Group E students were given experimental treatment with the AutoCAD teaching technique. Group C were taught with the traditional lecture method. Both group E and C were given post-test. Symbolically, the design is represented as shown below on table 1;

Group	Pretest	Independent variable	Post-test
E = Experimental group	-	X	O <sub>2</sub>
C = control group C	-		O <sub>2</sub>

Where E = Experimental group E  
 C = Control group C  
 X = treatment given  
 O<sub>2</sub> = Post-test of both experimental and Control Group

### **Area of the Study**

The study was carried out in Sagbama Local Government Area of Bayelsa State. The zone has one Federal Science Technical College. The researcher used the Federal Science Technical College, Tungbo because students in the school offer technical

drawing. Federal Science Technical College operates with NABTEB recommended textbooks for technical drawing. The presence of some ICT facility prompts the researcher to carry out the study in this area.

### **Sample and Sampling Technique**

All the population of 10 female students were used as sample for the study. They are all students from Federal Science Technical College, Tungbo, Bayelsa State. They are arranged in two groups. They are all students from senior secondary school (SS1). They are randomly assigned to group E (consisting of 5 female students) and group C (consisting of 5 female students also). Random sampling technique was used to assign the students to the two groups.

### **Instruments for Data Collection**

Isometric and oblique achievement Test (IOAT) was used in this study. The IOAT consist of fifteen multi-choice objective questions and two essay construction questions. This instrument was given as post-test item at the end of the treatment. Students interest scale (SIS) consisting of 3 items were given to the students.

### **Validation of the Instrument**

The instrument was face validated by two experts from Technical education in Rivers State University of Science and Technology, Port Harcourt. They expressed the following;

- i) If the statements were actually clear, and overlapped  
Their corrections, recommendation and suggestions were effected before the instrument has used in the study.  
The reliability of the IOAT item was calculated to be 0.93 using Pearson product moment correlation coefficient method.  
The student interest scale item reliability coefficient was calculated to be 0.82 using Cronbach Alpha method.

### **Experimental Procedures**

The research used the regular Technical drawing teachers of the school. The teachers were trained on how to use the AutoCAD for the experimental group. The control group were taught with traditional lecture method of isometric and oblique drawing.

The treatment or experimental group teacher taught the students 3-D view of isometric and oblique shapes within two weeks using the normal school time table.

The experimental group studied with the aid of AutoCAD software package. The research briefed the school teacher on how to follow the IOAT lesson plan to teach the experimental group.

Student errors were correction by the teacher at the end of each lesson. At the end of the treatment, Post-test item on Isometric and Oblique drawing was administered to both experimental and control group. Students were given interest scale items to fill. Their options were noted and recorded.

### **Control of Extraneous Variable**

*Experimental Bias:* In other to reduce experimental bias, the subject teacher of the school was used for the study.

### **Method of Data Collection.**

The scores obtained from the post-test of the control and experimental group were compared to ascertain the effect of AutoCAD software package. The differences to the score were determined.

The interest scale of the students were collected and converted into simple percentages.

### **Method of Data Analysis**

Mean standard deviation and simple percentage were used in answering the research questions.

### **Results**

Research question 1

What is the effect of AutoCAD software in teaching Isometric and oblique drawing on female students mean achievement scores in Federal Science Technical College, Tungbo, Bayelsa State?

#### **Table 2**

Comparison of mean and standard deviation scores of female students taught isometric and oblique drawing with AutoCAD and female students taught with conventional lecture method.

Teaching Method	Mean	Standard deviation (S.D)
AutoCAD	79.40	7.84
Conventional lecture method	48.60	9.14

From table 2, it revealed that female students taught isometric and oblique drawing with AutoCAD perform batter than female students taught with conventional lecture method.

**Research question 2**

What is the effect of AutoCAD software on Female student interest in teaching Isometric and oblique drawing in federal science technical colleges, Tungbo, Bayelsa State?

**Table 3**

Survey items	Strongly agreed	No opinion	Strongly disagree
The use of AutoCAD strengthen my learning ability in isometric and oblique drawing.	70%	20%	10%
The use of AutoCAD makes the learning of isometric and oblique drawing easy.	93.2%	5.2%	1.6%
The use of AutoCAD makes the learning of isometric and oblique drawing enjoyable	69%	11%	20%

Table 3. showed that 70% of female students were strengthen in their learning ability when taught with AutoCAD, while 20% and 10% has no opinion and strongly agreed respectively on the with use of AutoCAD. Also 93.2% strongly agreed that the use of AutoCAD makes learning of isometric and oblique drawing easy. Finally, 69% of female students strongly agreed that learning of AutoCAD makes isometric and oblique drawing enjoyable. While 20% strongly disagree that the use of AutoCAD does not make the learning of isometric and oblique drawing enjoyable.

**Summary of Findings**

From the results obtained using mean, standard deviation and simple percentages, the following were observed;

Research questions reveals that female students taught isometric and oblique drawing with AutoCAD perform better than those taught with conventional lecture method. Their mean score and standard deviation for AutoCAD and convention lecture method are 79.40 (mean); 7.84 (S.D) and 48.60 (mean), 9.14 (S.D).

Also, from the result on research questions 2, it is reveal that more than 50 percent of female students learning isometric and oblique drawing with AutoCAD in the school have strong interest in technical drawing.

**Educational Implication of the Study**

The outcome of this study has a number of educational implications for students and teachers. The result of the study show that the inculcation of AutoCAD in the teaching

of isometric and oblique drawing makes the learning of the subject more easier. It is expected that teachers of technical drawing in secondary and tertiary institution should advance their knowledge by learning this new teaching techniques for the purpose of teaching and assessing students' performances.

### **Conclusion and Recommendations**

Based on the results of the data analysis, the post-test scores of female students taught isometric and oblique projection with AutoCAD perform better than those taught with conventional method. Therefore, it is recommended that technical drawing teachers of technical institutions should be trained on the use of AutoCAD software.

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