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EFFECT OF COMPUTER ASSISTED INSTRUCTION ON STUDENTS' ACADEMIC ACHIEVEMENT AND RETENTION IN RADIO TELEVISION AND ELECTRONIC WORKS IN TECHNICAL COLLEGES IN LAGOS STATE

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Abstract
The study investigated the effects of Computer- Assisted Instruction on students' achievement and retention in Radio Television and Electronic Works in Technical Colleges in Lagos State. Two research questions and two research hypotheses guided the study. The study adopted quasi-experimental research design. The instrument used for data collection are Radio Television Electronic Works Assessment Sheet (RTVEWAS) and Retention Test on Radio Television and Electronic Works (RTRTVEW) developed for the study whose reliability obtained using Guttmann Split-Half Coefficient whose coefficient value was 0.805. And the sample of the study comprises of seventy- eight (68) students which was drawn from two Technical Colleges as follows: Government Technical College (GTC) Agidingbi (experimental group) – thirty (33) and Government Technical College (GTC) Adosoba (control group) –thirty- five (35) students. The data collected was analysed using mean and standard deviation in order to answer the research questions while ANCOVA was used to test the hypothesis. The research findings revealed that there was no significant difference between the academic achievement of students taught in RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State and there was no significant difference between the retention ability of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.
Keywords: Technical College, RTVEW, Computer- assisted instruction, Achievement, Retention

Background of the Study

Technical colleges is a post-secondary vocational level of education in Nigeria where youths are trained in variety of skills especially in the manual skills. Technical college programme was intended to prepare students for entry different occupations for employment in the world of work (National Business Technical Education Board, NABTEB, 2012). Accordingly, the Federal Republic of Nigeria, FRN, (2014) stated that technical college is a segment of technical and vocational education programme designed to train manpower in the applied sciences, technology and business particularly at craft, advanced craft and technician levels among others. Technical colleges are regarded as the principal vocational institution in Nigeria (Okoro, 2019). According to Umunadi (2019) in Eze, Onwsa and Nwaosa (2020), technical colleges are principal vocational institutions in Nigeria which are designed to prepare the individuals to acquire practical skills, knowledge, and attitude at subprofessional level, primarily established to train craftsmen in various occupations. Technical colleges are therefore,

schools or training institutions where trade or trades are taught. Technical colleges offer the following programmes; block laying, bricklaying and concreting; carpentry and joinery; electrical/electronic; automobile, metalwork, fabrication, welding technology and Radio Television and Electronic works (RTVEW).

Radio Television and Electronics Works (RTVEW) syllabus have implemented a wide variety of teaching methods, which fit different roles in the teaching of its practical aspects. Some of these methods of teaching ought to be phased out or complemented with innovative instructional methods such as demonstration, lecture method, discussion method and host of others that needed complement computer assisted instruction in order to achieve the expected goal. In an attempt to remain in the 21st century, computer aided instruction was introduced to enhance successful learning.

Computer Aided Instruction (CAI) refers to instruction or remediation presented on a computer with computer programs are interactive and can illustrate a concept through attractive animation, sound, and demonstration. These allow students to progress at their own pace and work individually or problem solve in a group. Computers provide immediate feedback, letting students know whether or not their answer is correct. If the answer is not correct, the program (course-lab 2.4) shows students how to correctly answer the question. Brummer (2014) used Computer-assisted instruction to obtain interesting positive results in teaching and learning activities in various science and science-based courses. A computer has been found useful in engineering and most importantly as a veritable instructional tool (Ogu, 2013). The relevance of Computer-assisted instruction packages in a classroom setting cannot be over-emphasized. Computer usage as an educational aid has been effective in stimulating student's interest, retention and in providing individualized training at the students' own pace and direction (Brummer, 2014). Computer assisted instruction may also include computer tutorial, computer drill and practice, etc.

Drill and practice application are designed to help learners master already introduced skill or knowledge through repetitive work. For instance, the computer could present an exercise to which the learner is required to type in a response. Drill and practice involve a sequence of tasks, exercises, or words repeated over and over until they can be performed faultlessly. In a CAI drill and practice design, the computer screen presents the student with questions to respond to or problems to solve, the student responds, the computer informs the student whether the answer is correct and if the student is right, he or she is given another problem to solve, but if the student responds with a wrong answer, he or she is corrected by the computer (Mudasiru and Adedeji, 2010). Thereby enhancing the students' academic achievement in the Technical Colleges for better output.

Achievement is the total outcome of the learner's performance and success. Academic achievement is a measure of cognitive skill possessed by a student. Igbo and Ihejiene (2014) view academic achievement as the successful result of interaction between a teacher and a student. It is designed to measure an individual's level of skill accomplishment or knowledge in a specific area. Retention of learning is simply the ability to remember what has been learnt. Eze, Ezenwafor and Obidile (2016) stated that retention is the ability to retain the knowledge of what is learnt and to be able to recall it when it is required. Retention scores indicate the percentage or degree of originally learned skill that is remembered or recalled as a function of elapse time. Retention is usually measured in collaboration with academic achievement. It is therefore seen as the achievement on a subject after a certain period of time. Retention helps in knowledge development. Knowledge development can be guaranteed when effective teaching methods are used in the teaching and learning process.

Statement of the Problem

Academic achievement and retention of every student majorly depends on the type of teaching methods, teaching strategies and instructional techniques or approaches employed by the teacher during instruction. The conventional teaching method termed to be teacher centered instead of students centered slows down creativity and disallowed students from thinking beyond what is presented to them by their teachers and also affect students' retention of the lessons taught. On this basis, computer aided instruction (Computer drill and practice) can be used to support the age-long demonstration method in order to overcome students' poor academic achievement in Radio Television and Electronic works in Technical Colleges in Lagos State. What effect would the computer aided instruction have on the students' academic achievement in Radio Television and Electronic works in Technical Colleges in Lagos State?

Purpose of the Study

1. Mean score effect of the academic performance of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.
2. Mean score effect of the retention ability of the students taught using drill and practice method and those taught using demonstration method in RTVEW in Technical colleges in Lagos State.

Research Questions

1. What are the mean score effect of the academic performance of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State?
2. What are the mean score effect of the retention ability of the students taught using drill and practice method and those taught using demonstration method in RTVEW in Technical colleges in Lagos State?

Research Hypotheses

1. There is no significant difference between the academic performance of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.
2. There is no significant difference between the retention ability of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.

Methodology

The study adopted pre-test, post-test non-equivalent control group quasi- experimental research design. Specifically the non-randomize control group designed involving two groups control and experimental groups. The study was conducted in two technical colleges in Lagos State, precisely Government Technical College (GTC) Adosoba and Government Technical College (GTC), Agidingbi. Population of the study was 68. There was no sampling of subjects as the entire population from the two Technical colleges offering the trade was involved in the study. The instrument used for data collection are Radio Television Electronic Works Assessment Sheet (RTVEWAS) and Retention Test on Radio Television and Electronic Works (RTRTVEW) developed for the study. The instrument was validated by three experts in the school of Technical Education. The reliability of the instrument was obtained from Guttmann

Split-Half Coefficient whose coefficient value was 0.805. The data collected was analysed using mean and standard deviation in order to answer the research questions while ANCOVA was used to test the hypothesis.

Results Presentation

***Research Question One*:** What are the mean score effect of the academic performance of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State?

Table 1

Mean score effect of the academic performance of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges

Treatment	Pre- Test			Post- Test		
	N	Pre- Test Mean	Pre Test Standard deviation	Mean	Post Test Standard deviation	Mean Achievement Gain
Drill and practice	33	28.48	9.786	51.76	11.435	23.28
Demonstration Method	35	31.54	6.195	44.23	11.228	12.69

In the Table 1 above which showed that the computer drill and practice method whose pre- test and post- test mean scores are 28.48 and 51.76 while their standard deviations are 9.786 and 11.455 respectively. The demonstration method however have pre- test and post- test means score of 31.54 and 44.23 while their standard deviations are 6.195 and 11.228 respectively. Therefore, the mean achievement gain for the computer drill and practice method was 23.28 while for the demonstration method was 12.69 indicating higher academic performance effect by using computer drill and practice method over the demonstration method in the use of practical activities in the teaching and learning of Radio Television and Electronic works in Technical Colleges in Lagos State.

***Research Question Two*:** What are the mean score effect of the retention ability of the students taught using drill and practice method and those taught using demonstration method in RTVEW in Technical colleges in Lagos State?

Table 2

The mean score effect of the retention ability of the students taught using drill and practice method and those taught using demonstration method in RTVEW in Technical colleges

Treatment	Retention			Post- Test		
	N	Mean	Standard deviation	Mean	Post Test Standard deviation	Mean Achievement Gain
Drill and Practice	33	49.58	9.679	51.76	11.435	2.18
Demonstration Method	35	41.83	10.051	44.23	11.228	2.40

Table 2 above showed that the computer drill and practice method produced the retention mean score and standard deviation values of 49.58 and 9.679 respectively. The demonstration method however have retention means score and standard deviation of 41.83 and 10.051 respectively. Therefore, the mean achievement gain in the retention level for the computer drill and practice method was 2.18 while for the demonstration method was 2.40, indicating higher retention ability level in the use of demonstration method over the computer drill and practice method in the teaching and learning of Radio Television and Electronic works in Technical Colleges in Lagos State.

***Research Hypothesis One*:** There is no significant difference between the academic performance of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.

Table 3
ANCOVA Analysis of the Students' Achievement using computer drill and practice method and those taught using demonstration method in Technical colleges

Tests of Between-Subjects Effects

Dependent Variable: Post-Test Achievement Computer drill and practice and Demonstration methods

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1133.025[a]	2	566.513	4.437	0.016	0.120
Intercept	3990.295	1	3990.295	31.249	0.000	0.325
Pre-Test Achievement Drill and practice and Demonstration	170.198	1	170.198	1.333	0.253	0.020
Treatment group	956.659	1	956.659	7.492	0.008	0.103
Error	8300.034	65	127.693			
Total	165338.000	68				
Corrected Total	9433.059	67				

a. R Squared = .120 (Adjusted R Squared = .093)

Table 3 shows that computer drill and practice method and demonstration method as the main effect is significant to students' academic achievement in Radio Television and Electronic Works (RTVEW). This is revealed by the calculated F-value of 1.333 and p-value of 0.253 is greater than 0.05. Therefore, the null hypothesis of no significant difference is accepted. This indicates that there is no significant difference between the academic performance of students taught in RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.

***Research Hypothesis Two*:** There is no significant difference between the retention ability of students taught RTVEW using computer tutorial method and those taught using demonstration method in Technical colleges in Lagos State.

Table 4
ANCOVA Analysis of the Students' retention ability using computer drill and practice method, and those taught using demonstration method in Technical colleges

Tests of Between-Subjects Effects

Dependent Variable: Pre-Test Achievement Drill and practice and Demonstration

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	110.314[a]	3	36.771	0.947	0.423	0.042
Intercept	1194.464	1	1194.464	30.749	0.000	0.325
Post-Test Achievement of Drill and practice/ Demonstration	23.696	1	23.696	.610	0.438	0.009
Drill and practice/ Demonstration- Retention	52.171	1	52.171	1.343	0.251	0.021
Treatment group	21.259	1	21.259	0.547	0.462	0.008
Error	2486.156	64	38.846			
Total	70448.000	68				
Corrected Total	2596.471	67				

a. R Squared = .042 (Adjusted R Squared = -.002)

Table 4 shows that computer drill and practice method and demonstration method as the main effect is significant to students' retention in Radio Television and Electronic Works (RTVEW). This is revealed by the calculated F-value of 1.343 and p-value of 0.251 is greater than 0.05. Therefore, the null hypothesis of no significant difference is accepted. This indicates that there is no significant difference between the retention ability of students taught RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.

Discussion of the Findings

The result of the findings revealed that the mean achievement gain for the computer drill and practice method was 23.28 while for the demonstration method was 12.69 indicating higher academic performance effect by using computer drill and practice method over the demonstration method in the use of practical activities in the teaching and learning of Radio Television and Electronic works in Technical Colleges in Lagos State. This indicated that there is no significant difference between the academic achievement of students taught in RTVEW using drill and practice method and those taught using demonstration method in Technical colleges in Lagos State. The result of this study is contrary with the findings of Ada, Anyachebelu and Chinyelu (2012); Madjoub (2013) who found and reported that there was significant difference in the performance of students taught by CAI and LM. Miandoab, Mostafaei and Ghaderi (2012) in Galle (2021) reported that there was statistically significant difference between the mean achievement gain of students taught Economics using computer-assisted instructional approach (Course-lab 2.4 eLearning Package) and those students taught with conventional instructional method (conventional instructional tools). Consonant to the above finding, the result is in agreement with the previous finding of Bayraktar (2008) who could not found any significant difference between the students exposed to CAI and those exposed to lecture method.

Additionally, the mean achievement gain in the retention level for the computer drill and practice method was 2.18 while for the demonstration method was 2.40, indicating higher retention ability level in the use of demonstration method over the computer drill and practice method in the teaching and learning of Radio Television and Electronic works in Technical Colleges in Lagos State. This indicates that there is no significant difference between the retention ability of students taught RTVEW using drill and practice method and those taught

using demonstration method in Technical colleges in Lagos State. This result disagree with the findings of Nwanne and Agommuoh (2017) in Eze, Ezenwafor and Onwusa (2020) which reported that the mean retention scores of students taught with CBI achieved more than those taught with L/DTM.

Conclusion

Conclusively, the study attempted to find out how the effects of computer aided instruction on the students' achievement and retention in Radio Television and Electronic Works (RTVEW) in Technical colleges in Lagos State. And it was discovered that the computer drill and practice though very good and useful yet made no significant effect on the students' academic achievement in RTVEW than demonstration method of teaching and learning. Additionally, there was no significant difference between the retention ability of students taught RTVEW using computer drill and practice method and those taught using demonstration method in Technical colleges in Lagos State.

Recommendations

Based on the findings of the study, the following recommendations were made for positive academic achievement and retention of the students in RTVEW:

- The students should be ready to learn through the usage of computer drill and practice packages available for school learning in order to be relevant in the 21st century both to themselves and their world at large including the Technical Colleges in Lagos State;
- The conventional method of teaching and learning practical lessons should be supported with the computer- aided instruction in order to strengthened the networking of learning from the schools to the industries where the students marry what learnt in the school to the world of work, thereby, providing feedback on areas where adjustment needed to be made in order to prepare students toward the needs out there in the society;
- The government, school administrators and teachers should support the use of computer aided instructions for the teaching of the lessons in the Technical Colleges thereby making it possible to train students that will be computer literate in RTVEW thereby encouraging more students to enroll into the trade in the Technical Colleges in Lagos State.

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