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Effects of Reciprocal Peer Tutoring Teaching Method on Retention Ability of Basic Technology Students in Oyo State Junior Secondary Schools.

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Abstract
This study determined the effect of two teaching methods (conventional and RPT teaching methods) onstudent's academic achievement and retention of basic technology knowledge in Oyo state junior secondary schools. The study was guided by three research questions based on the purposes raised. The pretest-posttest control group quasi-experimental design was employed.All the students from two intact schools JSS2 classeswere used. A 45 item multiple choice instruments was administered to the two treatment groups before, after the treatment and delayed posttest and the scores so obtained were analyzed by mean and standard deviation. The findings revealed that RPT teaching methods have significant effect on students' achievement and retention of b/b and c knowledge. RPT teaching method was found to be more effective in making the students' to remember basic technology knowledge. It was therefore recommended that the RPT teaching method be used with confidence in Oyo state junior secondary schools.

Key words: Reciprocal peer-tutoring (RPT)Teaching methods, students, academic achievement, retention, basic technology, secondary schools.

Background to the Study

In developing country like Nigeria, there is need for efficient and well trained individuals who would be able to cater for themselves and participate productively in the development of the society (Lasisi, 2018). Education is sees as a process whereby individual is trained to record/experience a positive permanent change. Agbatogun (2010) posited that education is a systematic action of imparting knowledge, skills and habits to the learners in their preparation for meaningful life and to contribute to better society.

Lawal (2013) also sees education as the act of giving knowledge to or developing the abilities of people by teaching, training or schooling. It is seems as a process of impacting knowledge into students for positive and desirable changes in the recipients. It is a means of changing someone state of unknown to a state of known. Eze (2013) states that education, particularly technical vocational education and training is a veritable tool for achieving the much needed economic and technological development.

But for education to achieve all the aforementioned stand, effective and efficient teaching method cannot be veremphasized, teaching method is a process or strategies employed to impact knowledge into individual.

For effective teaching and learning to take place, teacher and teaching methods use in the classroom is essential, methods

of teaching used by teachers on individual students or group of students were found to be important if greater achievement is expected of the class. For effective teaching and learning,teachers are equipped with difference methods of teaching so as to cater for individual differences among students. These different methods help in improving academic achievement of students'knowledge (Ayano, 2013).Among this methods are conventional teaching method which is otherwise called lecture method. Lecture method as a learning method is regarded as a medium through which message is passed between the originator(teacher) and the receiver (student) or a channel of which message (teaching) is delivered between teacher and students.

Subsequent upon the aforementioned, teachers are expected to develop and employ teaching methods that will promote learning when used for them, the method promotes students interest and affirmed retention of acquired knowledge so as to achieve the slated education objectives. Igbokoand Ibeneme (2006) cited by Lasisi (2018) stated that traditional education practices such as demonstration and lecture methods alone have proved incapable of producing skills required for copying with the challenges posed by rapid technological development. Teachers are strongly advised to make use of the students' activity centered method which can be used also for workshop activities to teach in

order to promote academic achievement and retention of facts in basic technology.

In order to achieve this landmark of higher retention of learnt concepts of basic technology, there is need for appropriate application of teaching methods for optimum achievement and retention of facts to be guaranteed. Reciprocal Peer Tutoring (RPT) is one of the methods (Umameiye&Adua-ogiegbaen, 2006).

Reciprocal Peer Tutoring is a teaching method in which students of the same class and of the same age undertake the teaching of themselves through a process whereby one student among the group teaches other students (Uwameije&Adua – Ogiegbaen, 2006). This method is described as a process where the fear being create by teachers present in the class is revised when a student in a group/class teaches other members of the group/class, may be under the supervision of school or a teacher. According to Obiunu (2008). Reciprocal peer tutoring is a form of cooperative learning, which has been found to be an effective technique for increasing students' achievement and retention. Reciprocal peer tutoring is an instructional means in which peer in a group whose has different levels of difficulties teaches one another in order to achieve the overall goal of such a group. Mickelson el.al (2009) explained that in a reciprocal peer tutoring class/group, individuals explain the topic/content they understand better to their group/class member for their own better

understanding. Slavin (2011), positive that reciprocal peer tutoring could produce positive effects on student academic achievement and retention when used. It is a method that can transforms learning from a private to a social activity when students' were involves in the responsibilities of teaching themselves.

Egbochuku and Obiunu (2006) noted that, one of the advantages of peer support programme is that it provides a non-judgmental acceptance, care, support and it provide opportunities to give and receive from others, and it also creates a non-competitive empowering environment. This implies that these advantages encourage and create opportunities for peers to influence the development of attitudes and behaviours in ways that are positive.

However, all efforts putting into teaching and learning become futile or effort infertility when substance learnt or knowledge acquired cannot be making use at a distance time. So for material/substance learnt to be useful it must remain in the learner's mind, stored up somewhere it can be recall for use with ease. This process is called retention. Ausubel and Robinson (2002) posted that retention is the repeated performance of behaviours earlier acquired by the learner and elicited after an interval of time.

Retention therefore, is the ability of students' to recall acquired or learnt concept over a period of good time, it is also the ability to replay/remember and uses of knowledge acquired by

the students' in a course over a time. Lasisi (2018) define retention as ability of someone to keep and recall past experiences or recognize what has been learned or experienced from memory. It implies that any student who repeats an already acquired knowledge with little error is said to have retained the material learnt.

Demmart (2001) as cited in Lasisi (2018) notes that retention is affected by the degree of original learning reinforcement, learners, memory capacity and method of learning which could be passive or participating (active) and to ensure the performance of students' in a later recall of learnt figure.

According to Houghton (2007), retention is defined as the ability of the mind to remember information acquired from reading, observation or other processes. It becomes very important to note that without ability of students' to recall acquired factor knowledge at later time by students' the teacher needed to adjust his method of teaching to the one that helps comprehension of facts by the students.

Retention with respect to basic technology means that student has an ability to recall or recognize the basic technology concepts which they have been taught previously. Basic technology is an introductory to technology subject that exposes junior secondary school students' to basic technology concept, in mind of preparing them for career in engineering/technology field.

Basic technology holds a unique place as it teaches the students' what technology is and how science is used to promote human advancement. The subject is divided and presented in such a way that the child discovers the fundamental unity of technology, the similarity of approach to solving technological problems in everyday life and the world (Ayano, 2013). Basic technology is a compulsory subject in the Nine Year Basic Education programme. It purposes is to contribute to the achievement of the national education goals by inculcation of technology literacy. The aim of basic technology is to introduce students' to technology right at the beginning of their junior secondary basic technology curriculum consist of various topics; the following topics are captured in this study introduction to technology, safety precaution, materials and materials processing, drawing practices, tools and equipment.

Lasisi (2018) posited that effective teaching and learning of basic technology will expose students' to the world of work and eventually qualify them to progress to higher educational level so that they could become middle level manpower who are knowledgeable in the field of technology and who possess the skills and ability to solve societal problems. Basic technology students' are therefore expected to have introductory competencies in technology related field which includes the ability to develop functional knowledge of basic technology concepts and principles.

Statement of the problem

The poor performance of students in basic technology has been a reoccurring issue, years after years students' turn out to be very miserable and inattentive in basic technology class after being taught a conceptwith ease within a short distance. This problem continues to militate against the objectives of basic technology in our junior secondary school. Meanwhile, basic technology is incorporated in JSCE syllabus mainly to ensure acquisition of basic and introductory knowledge of technology, also to help students' develop basic skills in modern technology and also to prepare them for further training in engineering. The reasons for this difficulty could be trailed to the methods of teaching used to explain those basic concepts of technology to the students'. Lasisi (2018) noted that, those are opinions that associated poorachievement of student to bad or inappropriate methods and strategies of teaching used, lack of instructional materials and wrong method of teaching, which often is teacher-centered and often creates frustration. The declining trend in the academic achievement in basic technology by junior secondary school students' in public examination e.g. NECO, Basic Examination for JSS 3 students.

Between 2015 – 2019 JSS 3 NECO results released showed that 24% of students' passed at credit level and above in the state. This poor performance is traceable to inappropriate method

of teaching basic technology. The problem of this study therefore, is that students' are performing very low in their junior secondarycertificate examination in basic technology. Therefore,poor and inappropriate teaching method could be one of the factors contributing to notice poor academic achievement and retention of facts by the students.

Purpose of the Study

The major purpose of this study is to investigate the effects of reciprocal peer-tutoring on basic technology students' achievement and retention in Government technical college Oyo. Specifically the study sought to find out;

1. The retention means scores of students' taught basic technology using reciprocal peer tutoring instructional strategy.
2. The difference between retention mean scores of basic technology students' taught using reciprocal peer tutoring teaching method and these taught using conventional technical method.
3. The different between retention mean scores of male and female students' taught basic technology using reciprocal peer tutoring teaching method.

Research Question

1. What is the effect of reciprocal peer tutoring method on academic retention of students' taught basic technology

compared with those taught with conventional teaching method?

2. What is the different between retention mean scores of basic technology students' taught with reciprocal peer tutoring over those taught using conventional teaching method?
3. What is the different between retention mean scores of student's taught basic technology using reciprocal peer tutoring and those taught using conventional teaching method?

Research Design

The study adopted quasi-experimental design, where pre-test and post-test (delayed) were involved. Quasi-experimental is a research process where random assignment of subjects to experimental and control is not possible (Uzoagulu, 2011).

Population of the Study

The population of the study consists of 19,742 (9,742 males and 10,000 female students) in JSS 2 in the 602 public junior secondary school in Oyo state in 2018/2019 academic session.

Sample and Sampling Technique

The sample for the study was two junior secondary school drawn through the process of simple random sampling technique (balloting with replacement) the two schools possesses the characteristics of the entire population of the study. Simple

random sampling technique was also adopted in assigning the two schools to experimental group (E) and control group (C). Control group is the group in which students' were kept busy by a teacher using conventional teaching method while experimental group is the group to which treatment were given (RPT) instrumentation. The instrument titled Basic Technology Achievement and Retention Test (BTART) draw by the researcher were used to collect data from the sample. The instrument is divided into two sections, section X seeks to elicit bio data of the students while section Y seeks to elicit responses on item based on the purpose of the study, the section is made up of 45 objective test items with a four option multiple choice. The instrument covers the entire basic technology topic treated. The instrument was also used for both the pre-test and post-test only that the items was reshuffled before being used for post-test. The instrument is delayed for post-test delayed test (retention) doing that, thecolour of the paper changed and reshuffled again for re-administration.

Validation of the Instrument

The instrument for data collection was validated by three experts, two from the Department of Technical Education and one from the Department of Curriculum and instruction, both from Emmanuel Alayande College of Education, Oyo. The experts were given the topic, purpose of the study, research questions, contents to be covered, lesson plan and the instrument. They

scrutinized the items and their observations were effected in the final draft of the instrument.

Reliability of the Instrument

The reliability of the instrument was determined with test-retest method whereby it was administered on 47 JSS2 students at Yaba Comprehensive College, Yaba, Lagos. The instrument was administered for 60 minutes as recommended by Uzoagulu (2011). Pearson Product Moment correlation was used to determine the degree of linear relationship between the two sets of scores and the reliability coefficient of 0.78 was obtained.

Method of data Collection

BTART was administered as pre-test to the respondentsin both control and experimental group. Post-test were later administered after four weeks of treatment, the same pre-test instant was reshuffled before re-administering it, each round of administration lasted for 60minutes, the paper collect, mark and scored in the answer provided. The same instrument were delayed for another 15days, reshuffled, colour of the paper change and administered on the same sample as delayed(retention).

Method of Data Analysis

The scores of pre-test, post-test and delayed post-test (retention) of the two groups were collected and analyzed. The descriptive statistics of mean and standard deviation were used to answer the research questions.

Presentation of Results

Research Question 1:- What are the effects of reciprocal peer tutoring teaching method on academic achievement of students' taught Basic Technology and those taught using conventional teaching method?

Table 1:- Achievement Mean Scores of Students' Taught Basic Technology Reciprocal Peer Tutoring Teaching Method and Those Taught Using Conventional Teaching Method.

S/N	Groups	Number	Pre-test $\times^1$	Post-test $\times^2$	Mean difference $\times^D$
1.	Experimental group	57		57.677	24.93
2.	Control group	52		30.74	24.93

Table 1 show experimental and control group post-test mean achievement scores of 55.67 and 56.79 respondent with a mean difference of 24.93. Thisresult shows that after treatment, the students in the experimental group performed better and higher

than those in the control group. By implication, reciprocal peer tutoring teaching method has positively affected the students.

Research Question 2:- What is the difference between retention of mean scores of students' taught basic technology using reciprocal peer tutoring and those taught using conventional teaching method.

Table 2:- Retention Mean Scores of Students' Taught Basic Technology Using Reciprocal Peer Tutoring Teaching Method and Those Taught Using Conventional Teaching Method.

S/N	Groups	Number	Post-test $\times^1$	Delayed Post-test $\times^2$	Mean difference $\times^D$
1.	Experimental group	57	55.67	65.67	35.90
2.	Control group	52	30.74	29.77	35.90

Table 2: shows that experiment group and control groups delayed post-test mean retention scores of 65.67 and 29.77 respectively with a mean difference of 35.90. this indicate that the students in the experimental group recorded higher and appreciable mean retention scores than those in the control group.

Research Question 3:- What is the effectiveness of retention peer tutoring teaching method on the retention of male and

female students in basic technology using their post-test and delayed post-test scores?

Table 3:- Retention Mean Scores of Male and Female Students' Taught Basic Technology With Reciprocal Peer Tutoring in Their Post-Test and Delayed Post-Test.

S/N	Groups	Sex	Number	Post-test mean $\times^1$	Delayed Post-test mean $\times^2$	Mean difference $\times^D$
1.	Experimental group	M F	31 26	56.18 52.34	64.84 59.71	8.66 7.37
2.	Control group	M F	29 23	32.43 30.14	30.42 29.24	0.99 -0.9

Table 4 shows the difference between the mean retention scores of male and female students taught basic technology using conventional teaching method and those taught using retention peer tutoring teaching method. The table revealed that male students taught basic technology using retention peer tutoring teaching method obtained a mean scores of 56.18 post-test and 64.84 in delayed post-test (retention) with a mean difference of 8.66 while female students taught basic technology obtained a mean scores of 52.34 in post-test and 59.71 in delayed post-test with the mean difference of 7.37. The result in the table also indicated that male students different slightly from that of those

female counterpart in the mean difference by 1.27 in favour of male students.

Discussion of Results

The study revealed that students who were taught basic technology using reciprocal peer tutoring teaching method achieved higher post-test scores than those taught using conventional teaching method. The findings is line with the findings of Lasisi (2018)

Results of the study on research question 2 reveled that students taught with retention peer tutoring teaching method retained better what they have been taught over a good period of time over that those taught with conventional teaching method. By implication method of teaching is very crucial to what students retain after the period of teaching. Chriason, Kurumeh and Obide (2010) agreed with.

Findings on male and female retentive ability revealed that students taught basic technology using reciprocal peer tutoring teaching method archived significally in post-test and the delayed post-test mean scores. This implies that reciprocal peer tutoring teaching method was effective and efficient with the ability to improve basic technology students' academic achievement and retention. This corroborate the Wynm, Moshorder and Lasisi (2014) which reported that students taught with reciprocal peer tutoring teaching method performed better and that gender was in

significant in the knowledge retention of students, Olawoyin (2014) was corroborated.

Conclusion

Based on the findings of the study, it was concluded that reciprocal peer tutoring teaching method is very effective strategy for improving students' academic achievement and retention in basic technology, because it is seen to be students' centered and students' participating method.

Recommendation

Based on the findings of the study, the following recommendations were raised:

1. Handlers of basic technology at their levels should acquire the skills and ability of using reciprocal peer tutoring teaching method by any desirable means.
2. School authorities should be encouraged and support teachers' of basic technology to acquire and use reciprocal peer tutoring teaching method for maximum results at that level.
3. Stakeholders like curriculum developers, professional body in basic technology and school should also support students to developed partial interest in building once ability through adoption of retention peer tutoring teaching method themselves.

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