

IMPACT OF TWO MODE OF TEACHING STRATEGY ON JUNIOR SECONDARY SCHOOL STUDENTS' ACHIEVEMENT AND INTEREST IN BASIC TECHNOLOGY IN NIGER STATE

Judith Kanu^{1*}, Charles Saidu Tukura², Adamu Abdulmalik³ and Abdullahi Shaba Mohammed⁴

¹Nigerian Education Research and Development Council (Nerdc), Sheda-Abuja, Nigeria

²Department of Educational Technology, Federal University of Technology, Minna, Niger State

³Fati Lami Abubakar Institute for Legal and Administrative Studies, Nigeria

⁴Scientific Equipment Development Institute, Minna

*Corresponding E-mail: kanujudith8@gmail.com (Tel: +2348055511197)

Abstract: The study was designed to determine the impact of two mode of teaching strategy on junior secondary school students' achievement and interest in Basic Technology in Niger State. The design of this research study is quasi-experimental design. The study was carried out in Junior Secondary Schools in Minna Educational zone. The population of this study was Junior Secondary School II (JSS II) students of basic technology in Minna Educational Zone of Niger State. The Basic Technology Achievement Test (BTAT) and Basic Technology Interest Inventory (BTII) were as the instrument for data collection. BTAT and BTII was trial test on thirty-one JSSII students from Government Secondary School, Bida. Thus an internal consistency estimate of 0.98 and 0.93 was calculated for BTAT and BTII. Mean and standard deviations was used to analyze the research questions. While Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 alpha levels of significance. The findings revealed that peer-teaching yielded a significant difference on students' achievement in Basic Technology than conventional (lecture) teaching method, that cooperative learning yielded a significant difference on students' achievement in basic technology than peer-teaching and that peer-teaching comparatively enhanced students' interest in learning basic technology than the conventional (lecture) teaching method. Consequently, the research recommended that; Cooperative learning and peer-teaching should be emphasized and incorporated into the basic technology curriculum. The principles guiding the effective use of the two teaching approaches should be taught to the student-teachers; Professional Associations like the Science Teachers' Association of Nigeria (STAN) should popularize the effective use of cooperative learning and peer-teaching in teaching basic technology through seminars, work-shops, conferences and publications among others.

Keywords: Cooperative Learning, Peer-Teaching, Achievement, Interest, Basic Technology

Introduction

Basic technology is a multidisciplinary and pragmatic field of study which aims at exposing the individuals with necessary basic career skills and knowledge. Basic Technology includes Metalwork, Woodwork, Automechanic, Technical Drawing, Electrical, Electronic, and Building Construction among others. Federal Republic of Nigeria (2013), states that basic technology shall continue to be taught in an integrated manner in the school to promote in the students, the appropriate basic career ideas and to provide technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development. Basic Technology is one of the core subjects in Junior Secondary Schools which include both theory and basic practical.

Secondary education is of six years duration given in two stages: a junior secondary school stage is of three years duration and the second stage is senior secondary school which is also of three years duration. The Federal Republic of Nigeria (2013) emphasized junior secondary education as the education children receive after primary education and before senior secondary education. The junior secondary school is planned as neighbourhood school which shall provide all primary school leavers with the opportunity for education of a higher level, irrespective of sex, social status, religion or ethnic background; it is the last three years of the 9 year basic education. The 9 year basic education curriculum is such that provides that Nigeria children will be in school for 9 years of continuous schooling, 6 years of primary education and 3 years of junior secondary education.

All students in junior secondary school shall be exposed to Basic Technology as an introduction to technological education. (FME, 2010) sees junior secondary education as a period to lay a foundation for technology and reflective thinking and with a desire for self-improvement. The policy on education states further that junior secondary shall be both prevocational and education. The development brought by technological advancement thus rendered conventional teaching method inadequate to impart the necessary functional and sophisticated skills needed by the learners. Greater stress should therefore be placed on providing students with broad learning and problem-solving skills in order to prepare them for a wide range of changes posed by technological advancement (Orora *et al.*, 2014). For this to be achieved, teachers who are the facilitators and executors of government policies on any educational programme that will bring positive changes and portray the good image of Niger State and the nation at large now and in future need to consider the teaching approach been used. For these reasons, teachers are therefore expected to use the best teaching approach that will boost students' interest to attain better academic achievement.

Despite the needs for adjustment, lecture method and demonstration method are still the main teaching/learning strategies employed for implementing the curriculum in junior secondary schools. Teachers are set as the only active participant in the class while students are made observers or admirers throughout the class. Glomo-Narzoles (2014), said the methods are content driven and certainly not learner-centered. These methods referred to as conventional methods which are predominantly used in teaching Basic Technology in junior secondary schools cannot achieve the best desired for the learners. These conventional methods of teaching may also account for poor performance of vocational education students at public examinations (Adamu & Mahmood, 2010). The consequence of using these approaches in teaching Basic Technology in junior secondary schools is that, students might lose interest in learning the subject and they cannot apply it in new situations. In pursuance of this, it is imperative to consider the teaching approach that will have impact on the students' academic achievement in Basic Technology in the schools. Fakeye (2010) stated that contemporaneous teaching is perceived as a range of activities aimed at assisting the learners acquire knowledge, attitudes, values, habits and basic skills.

Students' poor performance and interest in basic technology for quite a long time now, has resulted to inadequate number of students offering basic technology junior secondary schools in Niger state. Persistent poor performance has also contributed to poor economy, poor industrialization, lack of job, starvation, lack of peace to mention but a few. Njoku (2015) maintains that teachers are under intense pressure to cover the curriculum and get students ready for examinations. This makes teaching of basic technology inadequate as special approach needed for the teaching of basic technology are over looked. Learners therefore find the subject irrelevant to their daily experience and survival needs in their socio-cultural and economic environment. Ezeliora (2013) also attributes students' poor performances in basic technology to poor instructional approaches involving excessive teacher-talk, copying of notes, rote-learning as encouraged by expository method of instruction. Poor instructional approach is therefore recognized as a major contributor to poor achievement in basic technology. Nnaka (2017) suggest a shift and going beyond the conventional approaches of teaching Science, Technology and Mathematics, (STM) for better performance and interest in STM education in our primary and secondary schools. Shifting and going beyond the conventional teaching approaches according to Nnaka (2017) implies adopting the innovative approaches to teaching and learning STM.

Cooperative learning is the deliberate instructional use of small groups of students who work together to maximize each others learning. Cooperative learning is theoretically based on the work of psychologists like Levi Vygotsky, Jean Piaget, Jerome and Bruner among others who propose that children actively construct knowledge in a social context (Conway, 2007). The teacher therefore should create room for cooperation amongst students for effective cross-fertilization of ideas and knowledge sharing. No child learns effectively in isolation. The teacher, who adopts the cooperative learning strategy, organizes the students in small groups of between four to six members. Each group should be heterogeneous in ability and socio-cultural background; members work jointly through a given instructional assignment until every member successfully understands, and completes the assignment. The students are rewarded in their groups.

Peer-teaching is an instructional strategy in which groups of children under the guidance of the teacher work together through a given instructional assignment with brilliant child, the peer teacher; providing assistance and instruction to others, the peer students. Peer-teaching is also theoretically based on the conceptions of the cognitive theorists like Vygotsky who proposed the zone of proximal development. The proposal points to the child's ability to profit from interaction with more competent peers (Igbo, 2014). The teacher who adopts the peer teaching strategy will identify the high, middle and low achievers amongst the students. The high achievers are used as the peer teachers and middle/low achievers are assigned in their small numbers to the peer teachers for instruction and assistance. The teacher prepares the lesson plan and reviews it for the peer teachers in sequential order. He also trains the peer teacher on how to inform, reward and relate to the students.

Both the cooperative learning and peer teaching are child-centered instructional approaches, which is an approach recommended on the National Policy on Education for teaching sciences (Federal Republic of Nigeria, 2013). Igbo (2014) found peer-teaching effective in improving the learning disabled achievement in mathematics. There is therefore the need to explore the effects of the two child-centered instructional approaches: cooperative learning and peer-teaching on students' achievement and interest in basic technology so as to probably improve students' performance in basic technology and avert the problems of poor achievement and interest in junior secondary schools. Interest, an aspect of affective domain is a construct that has to do with ones readiness to like or dislike something. It could be aroused in individual by activity that tends to satisfy the individuals needs (Geoscience, 2007). It might therefore not be out of place to investigate the impact of these strategies on student's achievement and interest in basic technology in an attempt to improve on student's achievement in basic technology.

Statement of the Problem

Poor students' achievement and interest in basic technology is alarming inspite of the fact that many researches have been carried out to ameliorate the bad situation. Many instructional approaches have been proffered by psychologists like Brunner, Peaget, Gagne and Ausubel for improved achievement and interest in basic technology and others. Njoku (2015) strongly believed that the instructional approach adopted by basic technology teacher in teaching basic technology is to a large extent responsible for the observed consistent poor achievement and interest in basic technology. The conventional teaching methods lack student's cooperation and interaction required for effective learning of the basic technology. Adequate student's cooperation and interaction are required for over learning and transfer of learning in basic technology. Such cooperation and interaction are found in the cooperative learning and peer-teaching strategies. The problem of this study was to find an effective instructional approach that can improve students' achievement and interest in basic technology. Hence, the need to investigate the impact of these strategies on students' achievement and interest in basic technology with a view to improving their achievement.

Purpose of the study

The main purpose of this work was to investigate the effects of cooperative learning and peer-teaching on students' achievement and interest in basic technology. Specifically, it sought to:

1. Determine the achievement level of students of basic technology in Junior Secondary School when taught using cooperative learning and peer-teaching.
2. Achievement level of male and female students of basic technology in Junior Secondary School when taught using cooperative learning and peer-teaching.
3. Determine the interest level of students of basic technology in Senior Secondary School when taught using cooperative learning and peer-teaching.
4. Interest level of male and female students of basic technology in Junior Secondary School when taught using cooperative learning and peer-teaching

Research questions

1. What are the mean achievement scores of students taught basic technology using cooperative learning, peer- teaching and conventional teaching method?
2. What are the mean achievement scores of male and female students taught basic technology using cooperative learning, peer-teaching and conventional teaching method?
3. What are the mean interest scores of students taught basic technology using cooperative learning, peer- teaching and conventional (lecture) teaching method?
4. What are the mean interest scores of male and female students taught basic technology using cooperative learning, peer-teaching and conventional teaching method?

Hypotheses

1. There is no significant difference in the mean achievement scores of students taught basic technology using cooperative learning, peer- teaching and conventional teaching method.
2. There is no significant difference in the mean achievement scores of male and female students taught basic technology using cooperative learning, peer-teaching and conventional teaching method.
3. There is no significant difference in the mean interest scores of students taught basic technology using cooperative learning, peer- teaching and conventional teaching method.
4. There is no significant difference in the mean interest scores of male and female students taught basic technology using cooperative learning, peer-teaching and conventional teaching method.

Methodology

The design of this research study is quasi-experimental design. The study was carried out in Junior Secondary Schools in Minna Educational zone. The population of this study was Junior Secondary School II (JSS II) students of basic technology in Minna Educational Zone of Niger State. Coeducational schools in Minna Education Zone were used in this study. This was to ensure that subjects, male and female students are equally involved in the experiment since gender was an important variable of the study. There were seventeen coeducational schools in the zone. Random sampling involving balloting was used for assigning sampled schools to experimental and control conditions. There were nine sample schools. In this way, three schools were assigned to each of the co-operative learning strategy, Peer-teaching strategy (experimental groups) and conventional method (control group). Incidentally, the sample schools had only one stream of JSS II offering Basic Technology.

The Basic Technology Achievement Test (BTAT) and Basic Technology Interest Inventory (BTII) developed by the researcher were used for data collection. The instrument was validated by two experts from the Department of Industrial and Technology Education, Federal University of Technology, Minna. The BTAT and BTII used was pilot- tested on thirty-one JSS II students of Government Secondary School, Bida. Scores generated from their responses were used to establish the internal consistency of the test items using Kuder- Richardson formula 20 (K-R, 20) and Cronbach's Alpha method. Thus an internal consistency estimate of 0.98 and 0.93 was calculated for BTAT and BTII.

Pretests using the validated BTAT and BTII were first administered on the subjects by the researcher himself and the result carefully recorded before the treatment session, which lasted for five weeks. A day after the treatment, post-tests were administered on the subjects by the researcher using the same BTAT and BTII as in pretest. The research questions were answered using mean scores and standard deviations of scores. The hypotheses were tested with Analysis of Covariance (ANCOVA) at 0.05 alpha levels of significance.

Results

Table 1: Mean Achievement Scores and Standard Deviations of Students in Pre-Tests and Post-Tests Due to Treatments

Treatment Groups	Pre-Achievement		Post-Achievement		Gain Mean Score	No of Respondents
	Mean	Standard Deviation	Mean	Standard Deviation		
Peer – Teaching	23.00	11.33	55.62	14.99	32.62	100
Cooperative Learning	30.44	10.80	62.28	17.05	31.84	90
Conventional (Lecture) Teaching	22.98	4.70	44.94	9.23	21.96	93

Table 1 shows that students taught using cooperative learning had the highest mean achievement score of 30.44 in the pretest. Students taught using peer-teaching had mean achievement score of 23.00 in the pretest, while those, taught using the conventional teaching method had the least mean score of 22.98 in the pretest.

In the post test students, taught using cooperative learning had the highest mean score of 62.28 followed by students taught using peer – teaching with mean score of 55.62. Students taught using conventional teaching method had the least mean score of 44.94.

The students gain mean score for the peer - teaching group was 32.62. The students gain mean scores for the cooperative learning and lecture method groups were 31.84 and 21.96 respectively. It seems therefore that the peer-teaching approach is the most effective in teaching basic technology.

Table 1 also shows that in the pretest, scores in peer – teaching group deviated highest from the mean score with the standard deviation of 11.33. Cooperative learning group with standard deviation of 10.80 followed it. Conventional method group deviated least from the mean score with the standard deviation of 4.70.

In the post – test, scores in cooperative learning group deviated highest from the mean score with standard deviation of 17.05 followed by the peer teaching group with standard deviation of 14.99. The lecture method group deviated least with standard deviation of 9.23. The high mean achievement scores in the post test for the cooperative learning and peer-teaching suggests that the two strategies may be effective in learning basic technology.

Table 2: Mean Achievement Scores and Standard Deviations of Scores of Male and Female Students in Pre-Tests and Post-Tests Due to Treatments

Treatment Groups	Sex of Respondents	Pre-Achievement		Post-Achievement		Gain Mean Score	No of Respondents
		Mean	Standard Deviation	Mean	Standard Deviation		
Peer – Teaching	Male	24.3636	11.82647	56.5091	13.81340	32.15	55
	Female	21.3333	10.57441	54.5333	16.40205	33.20	45
Cooperative Learning	Male	29.2453	10.89267	61.6981	16.43587	32.45	53
	Female	32.1622	10.57648	63.1081	18.07974	30.95	37
Conventional (Lecture) Teaching	Male	24.3878	3.9303	47.6939	7.59990	23.30	49
	Female	21.4091	5.01309	41.8636	9.97809	20.45	44

Table 2 shows that for the pre achievement, the highest mean score of 32.1622 was recorded by female students taught using cooperative learning while those taught using conventional teaching method had a mean score of 21.4091. Female students taught using peer-teaching had the least mean score of 21.3333. Scores of female students deviated highest from the mean score in the cooperative learning group followed by the peer – teaching group and the least deviation was found in the conventional method group.

In the post achievement, female students taught using cooperative learning had the highest score of 63.1081 while those taught using peer-teaching had a mean score of 54.5333. Female students taught using conventional teaching method had the least mean score of 41.8636. There was again highest deviation of scores from the mean score in the cooperative learning group followed by the peer-teaching group and the least deviation was in the conventional method group.

The gain means scores of the female students were 33.20, 30.95 and 20.45 for the peer-teaching, cooperative learning and lecture method groups respectively. Therefore, after treatment females gained highest mean score in peer –teaching group followed by cooperative learning group and the least in the lecture method group. It therefore seems that peer-teaching is more effective among females in learning basic technology than cooperative learning and conventional method.

In the pre achievement, male students taught using cooperative learning had the highest mean score of 29.2453 while those taught using conventional teaching method had a mean score of 24.3878. Male students taught using peer-teaching had the least mean score of 24.3636. There was highest deviation of scores from the mean score in the peer-teaching followed by the cooperative learning and the least deviation was found in the conventional method.

In the post achievement, male students taught using cooperative learning had the highest mean score of 61.6981 while those taught using peer-teaching had a mean score of 56.5091. Male students taught using conventional teaching method had the least mean score of 47.6939. The gain mean scores of male students were 32.45, 32.15 and 23.30 for the cooperative learning, peer-teaching and lecture method respectively. Therefore, after treatment, males gained highest mean score in the cooperative learning group, followed by the peer-teaching group and the least in the conventional method group. It therefore seems that the cooperative learning is more effective among males in learning basic technology than peer – teaching and lecture method.

Table 3: Mean Interest Scores and Standard Deviations of Students in Pre-Tests and Post -Tests Due to Treatments

Treatment Groups	Pre-Interest		Post-Interest		Gain Mean Score	No of Respondents
	Mean	Standard Deviation	Mean	Standard Deviation		
Peer – Teaching	37.8000	9.27471	64.1400	10.73205	26.34	100
Cooperative Learning	38.6111	9.97265	71.4444	11.04751	32.83	90
Conventional (Lecture) Teaching	42.3656	12.85774	49.8387	11.31399	7.48	93

Table 3 shows that students taught using conventional teaching method had the highest mean interest score of 42.3656 in the pretest. Students taught using cooperative learning had a mean interest score of 38.6111 while those taught using peer teaching had the least mean interest score of 37.800 in the pretest. There was the highest deviation of scores from the mean interest score in the conventional method group followed by the cooperative learning group and the least deviation was in the peer-teaching group.

In the post- test, students taught using cooperative learning had the highest mean interest score of 71.44 while students taught using peer-teaching had a mean interest score of 64.14. Students taught using conventional teaching method had the least mean interest score of 49.8387.

The student's gain mean scores were 32.83, 26.34 and 7.48 for the cooperative learning group, peer – teaching group and lecture method group respectively. The high mean interest score, for the cooperative learning and peer – teaching is suggestive of the fact that the two strategies were effective in developing students' interest in learning basic technology. It also seems that the cooperative learning is more effective than the peer-teaching in developing students' interest in learning basic technology.

Table 4: Mean Interest Scores and Standard Deviations of Scores of Male and Female Students in Pretests and Post-Tests Due to Treatments

Treatment Groups	Sex of Respondents	Pre-Interest		Post-Interest		Gain Mean Score	No of Respondents
		Mean	Standard Deviation	Mean	Standard Deviation		
Peer – Teaching	Male	38.9091	9.16368	65.2545	10.78273	26.35	55
	Female	36.4444	9.33117	63.4222	10.70363	26.98	45
Cooperative Learning	Male	38.2075	9.56226	71.8302	11.49872	33.62	53
	Female	39.1892	10.64017	70.8919	10.49811	31.70	37
Conventional (Lecture) Teaching	Male	43.8776	12.07551	52.0816	9.31137	8.20	49
	Female	40.6818	13.61732	47.3409	12.84422	6.66	44

Table 4 shows that for the pre interest, the highest mean score was recorded by male students taught using conventional (lecture) teaching method with mean score of 43.8776 while the male students taught using peer-teaching had a mean score of 38.909. Those taught using cooperative learning had the least mean score of 38.2075. There was the highest deviation of scores from the mean interest score for males in the lecture method group followed by the cooperative learning group and the least in the peer – teaching group.

In the post interest, male students taught using cooperative learning had the highest mean score of 71.8302 followed by those taught using peer – teaching with a mean score of 65.2545. Male students taught using conventional (lecture) teaching had the least mean score of 52.0816. There was highest deviation of scores from the mean interest score in the cooperative learning group followed by the peer-teaching group and the least deviation in the lecture method group. The gain mean scores of the male students were 33.62, 26.35 and 8.20 for the cooperative learning, peer – teaching and lecture method respectively. Thus after treatment, males gained highest mean score in cooperative learning group followed by those in peer-teaching group and the least in conventional method group.

It seems that the cooperative learning is the most effective followed by peer-teaching and the least, the lecture method in developing males' interest in learning basic technology as shown by the post-test mean interest scores in Table 4.

In the pre interest, female students taught using conventional (lecture) teaching had the highest mean score of 40.6818 followed by those taught using cooperative learning with a mean score of 39.1892. The female students taught using peer-teaching had the least mean score of 36.4444. There was highest deviation of scores from the mean interest score in the lecture method group followed by cooperative learning and the least deviation in the peer-teaching.

In the post interest, female students taught using cooperative learning had the highest mean score of 70.8919 while those taught using peer- teaching had a mean score of 63.4222. Female students taught using conventional (lecture) teaching method had the least mean score of 47.3409. There was highest deviation of scores from the mean interest score in the lecture method group followed by the peer-teaching group and the least deviation in the cooperative learning group.

The gain mean scores of the female students are 31.70, 26.98 and 6.66 for the cooperative learning group, peer-teaching group and lecture method group respectively. Therefore, after treatment, female students gained highest mean score in cooperative learning group followed by the peer-teaching group and the least in the lecture method group. Table 4 is suggestive of the fact that the cooperative learning is the most effective followed by peer-teaching and the least, the lecture method in developing females' interest in learning basic technology.

Table 5: Analysis of Covariance of Students' Post-Achievement due to Treatment and Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	19155.051 ^a	6	3192.509	17.332	0.000
Intercept	63480.618	1	63480.618	344.634	0.000
Pre-achievement	4170.798	1	4170.798	22.643	0.000
Treatments	9631.422	2	4815.711	26.144	0.000
Gender	201.926	1	201.926	1.096	0.296
Treatments * Gender	295.346	2	147.673	0.802	0.450
Error	50838.475	276	184.197		
Total	902148.000	283			
Corrected Total	69993.527	282			

Where: a. R Squared = 0.274 (Adjusted R Squared = 0.258)

Table 5 shows that the difference in mean achievement scores between the groups taught using the different teaching strategies in the covariates is significant since the worked F ratio of 26.144 is significant at $P < 0.000$. The difference in the mean achievement scores between the treatment groups is therefore significant at $P < 0.05$. Therefore it can be concluded that the research hypothesis 1 is rejected. The difference in the mean achievement scores of students taught basic technology using cooperative learning, peer-teaching and conventional teaching method is significant and not by chance.

Table 5 shows that the difference in the mean achievement scores of male and female student's taught using different instructional approaches is not significant since the worked F ratio of 1.096 is significant at $P > 0.296$. The difference in the mean achievement scores between the different sexes is not significant at $p > 0.05$. This implies that the difference in the mean achievement scores among males and females in each group is merely due to chance. The research hypothesis 2 is therefore accepted.

Table 6: Post Interest Analysis of Covariance of Students' Post-Interest due to Treatment and Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	31689.249 ^a	6	5281.541	58.970	0.000
Intercept	32561.162	1	32561.162	363.552	0.000
Pre interest	8698.364	1	8698.364	97.119	0.000
Treatments	26163.967	2	13081.988	146.063	0.000
Sex	198.212	1	198.212	2.213	0.138
Treatment * Gender	78.043	2	39.022	0.436	0.647
Error	24719.649	276	89.564		
Total	1139554.000	283			
Corrected Total	56408.898	282			

Where: a. R Squared = 0.274 (Adjusted R Squared = 0.258)

Table 6 shows that the difference in mean interest scores of students between the groups taught using the different teaching strategies is significant since the worked F ratio of 146.063 is significant at $P < 0.000$. The difference in the mean interest scores between the treatment groups is therefore significant at $P < 0.05$. Therefore it can be concluded that the research hypothesis 3 is rejected. The observed difference in the mean interest scores of students taught basic technology using cooperative learning, peer-teaching and conventional method is significant and not merely by chance.

Table 6 shows that the difference in the interest mean scores of male and female students taught using different instructional approaches is not significant since the worked f ratio of 2.213 is significant at $P < 0.138$. The difference in the interest mean scores between the sexes is not significant at $P < 0.05$. This implies that the observed difference among the male and female students in each group is merely due to chance. The research hypothesis 4 is therefore accepted.

Findings and discussion

Table 5 indicates that peer-teaching yielded a significant difference on students' achievement in basic technology than conventional (lecture) teaching method. The Table also indicates that cooperative learning yielded a significant difference on students' achievement in basic technology than conventional (lecture) teaching. The implication is that either of the cooperative learning or peer – teaching (both being child-centered) strategies could be applied to achieve goals of sciences in basic technology. This is line with Nnaka (2017) who calls for a shift from the conventional methods of teaching to innovative strategies in teaching science, Technology and Mathematics for effectiveness. The two strategies are learner-centred and more active than the conventional (lecture) teaching method. The result is also in line with the National Policy on Education which stresses that the teaching of basic technology should be centred on the learner for maximum self-development and self-fulfillment (FRN, 2013). The practical nature of most difficult basic technology concepts demands active participation of the learner which the conventional (lecture) teaching method does not usually provide. The conventional (lecture) teaching encourages rote learning (Amaefule, 2009) which is not suitable for learning. Therefore the abstract nature of the most difficult concepts could be minimized in the process of learning those concepts by using more pragmatic and effective teaching strategies such as the cooperative learning and peer- teaching.

On the other hand, the Table 6 indicates that cooperative learning yielded a significant difference on students' achievement in basic technology than peer-teaching. This also buttresses the effectiveness of learner's active participation in learning basic technology. Whereas the cooperative Learning involved the cooperation and full participation of each member of the group in learning basic technology, the peer – teaching involved a brilliant member of the group teaching others. Therefore, there is partial active participation of learners in the peer-teaching strategy. The implication is suggestive of the fact that the cooperative learning should be made use of in teaching basic technology more frequently than the peer-teaching for better results in realizing the goals of basic technology.

The table shows vividly that peer-teaching comparatively enhanced students' interest in learning basic technology than the conventional (lecture) teaching method. The table also is indicative of the fact that the cooperative learning was comparatively more effective in enhancing students' interest in learning basic technology, than both the peer teaching and the lecture method.

The active nature of cooperative Learning and peer- teaching impressed the students. They took interest in the discussion, analysis and problem solving in basic technology. This participation increased their interest in basic technology despite the nature of the concepts.

Taking interest in basic technology is a positive first step towards better performance in achievement tests. This idea agrees with Njoku (2015) who posits that capturing students' interest in basic technology is a necessary precondition for improved students' achievement in basic technology. This study has proved that the Learner Centredness of Cooperative Learning and Peer- teaching can greatly improve the students' interest in learning basic technology which in turn will enhance students' achievement in basic technology.

The conventional teaching method has been described as uninteresting to the students and ineffective due to its teacher-centredness and relative lack of activity on the part of the students. Teachers' extensive dependence upon conventional teaching in teaching basic technology does not enhance students' interest in learning basic technology as shown in Table 6. This is in consonance with Ezeliora (2013) who maintains that student's poor performance and lack of interest in basic technology could be traced to the science teachers' excessive use of the expository method of instruction. The table further indicates that cooperative learning is significantly more interest enhancing in students in learning basic technology than the peer-teaching. This confirms that the more child-centred a teaching approach, the more efficacious it is in realizing the educational objectives. The cooperative learning involved fairly equal contributions by students in the task of learning basic technology while in peer-teaching the peer students depended on the peer –teacher's contribution. Therefore the cooperative learning is more efficacious in this regards.

Table 6 shows that sex as variable had no significant effect on students' achievement in basic technology. The table also shows that the interaction effects of the teaching strategies and sex was not significant on students' achievement. The implication is that each of the three instructional approaches had equal or similar effects on both male and female students. This is in line with Igbo (2014) who maintains that instructional approaches neither favour nor disfavour a particular sex in achievement. A well applied teaching strategy would produce the same effects on the students' achievement in basic technology irrespective of sexes. That cooperative learning and peer-teaching made no significant difference in achievement of male or female students could be a function of the fact that students irrespective of their sexes react favourably to activity strategies in teaching. Therefore, either the cooperative learning or peer- teaching if effectively applied would enhance students' achievement in basic technology irrespective of their sexes. On the other hand, the less efficacious conventional (lecture) teaching method would mar students' achievement in basic technology irrespective of their sexes.

Table 6 indicates that sex as a variable had no significant effect on students' interest. The table also indicates that the interaction effects of the teaching strategies and sex was not significant on students' interest. Each of the strategies therefore had equal or similar effects on students' interest in learning basic technology irrespective of sex. Both sexes enjoyed equally the cooperative learning and peer-teaching could be because the two strategies were new and unfamiliar to both sexes. Therefore the novelty of the strategies excited both sexes equally. On the other hand, students in JSS II which was the class used for this work had already chosen basic technology as one of the subjects they will register in the external examination. Irrespective of sex, students had already developed a given level of interest in the subject. Therefore, teaching strategies could not have significant effects on the students' interest relative to their sexes. From the existing data, therefore, any of the two efficacious strategies: the cooperative learning or peer-teaching, if well applied would enhance and maintain students' interest in learning basic technology irrespective of the students' sexes. On the other hand, the less efficacious conventional (lecture) teaching would hinder the interest of students in learning basic technology irrespective of their sexes.

Conclusion

Both cooperative learning and peer teaching had been proved efficacious in enhancing students' achievement in basic technology but the cooperative learning yielded a better result. This means that in an effort to achieve set objectives of basic technology in Junior Secondary Schools, basic technology should be taught using more of the cooperative learning than peer-teaching. The conventional (lecture) teaching method had been proved to be ineffective in enhancing students' achievement in basic technology. Therefore the set objectives of science will be difficult to achieve using the conventional (lecture) teaching method. Again sex is not an important factor in determining the instructional approach to be adopted in teaching basic technology. Each of the teaching strategies had similar or equal effects on students' achievement irrespective of their sexes. With regard to interest both cooperative learning and peer-teaching had been proved in this work to be efficacious in enhancing and maintaining the students' interest in learning basic technology. However, the cooperative learning yielded a better significant result.

Recommendations

1. Cooperative learning and peer – teaching should be emphasized and incorporated into the basic technology curriculum. The principles guiding the effective use of the two teaching approaches should be taught to the student-teachers.
2. Stakeholders in basic technology like ministries of education, state school management boards, post primary school services commission, education commissions, school principals and teachers should organize seminars, workshops and conferences where teachers in the field would be opportune to learn how to make the best use of cooperative learning and peer-teaching in teaching basic technology.
3. Professional Associations like the Science Teachers' Association of Nigeria (STAN) should popularize the effective use of cooperative learning and peer-teaching in teaching basic technology through seminars, work-shops, conferences and publications.
4. The use of cooperative learning and peer-teaching should be recommended in school basic technology curriculum for teaching. The effective use of the two teaching approaches should be reflected in the curriculum materials like the text books and other instructional materials.

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