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Effects of Cooperative Learning Strategies on Secondary School Students' Interest in Computer Studies in Awka Education Zone

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Abstract
The study determined the effects of cooperative learning strategies on secondary school students' interest in Computer studies in Awka Education zone. Two research questions guided the study and three hypotheses guided the study. Quasi-experimental research design was adopted for the study. The population of the study was 6,334 senior secondary year two (SS2) students offering Computer studies from which 152 students was obtained using purposive and simple random sampling techniques. The instrument for data collection was Computer studies Computer studies Interest Questionnaire (CSIQ) validated by three experts. The reliability of CSIQ was established using Cronbach Alpha technique to be 0.82. The experiment groups were taught Computer studies using STAD and FTAI respectively while the control group was taught using lecture method. CSAT was administered as pretest and posttest to generate data for the study. Research questions were answered using mean and standard deviation and analysis of covariance was used to test the null hypotheses. There was a significant difference between mean interest scores of students taught Computer studies using STAD, FTAI and lecture method in favour STAD followed by FTAI. Also, gender had significant influence on students' interest in Computer studies. It was recommended that secondary school teachers should as often as possible give computer students group Computer studies assignments and project in order to develop in them skills of team study.

Keywords: *Interest, computer, cooperative, STAD*

Introduction

Computer and its technology have advanced tremendously in recent times. New computer hardware, software and computer programmes are being developed on daily basis. There has also being an on-going development in the area of Artificial Intelligence (AI). The application of computer technology has therefore, far reaching effect and there is hardly any discipline, life situation, home or individual that does not need computers or its correspondent accessories today. It is because of this all encompasses importance that Computer studies was introduced into the Nigerian secondary school curriculum. Despite its importance, students are beginning to lose interest in the subject owing to lack of update in its curriculum contents and difference between what is taught and what is in practice.

Common examples of difference in what is taught and what is in practice include among others; the use of computer tablets with detachable keyboards and wireless chargers and not laptops; use of airpods and not speakers and earpiece; speech writing and optical character image capture and not typewriting; wireless printing technology via Bluetooth and not from wired printers; saving of files in icloud and not in system files and folders; increased use of internet firewalls and security gates and not antiviruses; and information sharing via social media with is application in virtual and

out-of-school learning. These developments and more are not taught in school but constitute the simple computer applications which secondary school students constantly make use of. Thus, they are not interested in computer laboratory practicals and activities since their application is already obsolete.

Again, in the present age where solar emissions are used in generating electrical energies, teachers are dependent on generating sets in the absence of power from national grid. The cost of fuel and diesel are so high today in Nigeria (This Day, July, 2022, 2023) that school heads find it difficult to maintain the overhead cost of providing instructional materials and the environment needs for such subject as Computer studies. The dawn of social media as Konyefa and Okigbo (2020) put it, has more efficiently disposed students to the use of the internet beyond what is taught in the classroom, and by extent what is taught in the Computer studies curriculum especially in the lights of wifi technologies and virtual private networks. These developments as researchers unanimously noted, are some of the reasons why the teaching method adopted by the Computer studies teacher is by far the most important factor affecting interest of secondary school students in Computer studies.

Interest according to Edokwe (2018) is a positive or negative disposition or inclination to an object, place or person. Interest in learning is personal preferences with regard to learning, which sometimes means what an individual chooses one thing rather than other things and sometimes a positive psychological state occurs during his/her interaction with the circumstances that engenders further learning motives (Nweke, 2021). Interest has a powerful effect on cognitive functioning and academic achievement. Udegbe and Okoli (2022) emphasized that interest is closely related to student effort, forming a key component of intellectual engagement at school. Understanding students' interests helps the teacher to provide them with quality learning opportunities. By giving them the opportunity to explore areas they are interested in, they are more likely to engage with the learning process, although this may not be achievable with lecture method (Konyefa and Okigbo, 2021).

Lecture method used in this study implied direct teacher instruction, where the teacher is seen as the authority dishing out knowledge to the students. The implication is that students may become passive during the instruction so much that they may barely make meaningful contribution to the learning process. It is therefore suggestive that instructional methods that facilitate greater cooperation or collaboration among students, between students and teachers, and between the students and the learning materials have the potentials necessary for enhancing academic achievement. There is need therefore to innovate instructional methods by having recourse to those instructional strategies such as cooperative learning strategies such as Student teams-achievement divisions (STAD) and framing and team assisted individualized instruction strategy that ensure greater students' active involvement in the learning process and which makes learning meaningful enough to sustain interest.

Student teams-achievement divisions (STAD) according to Ibrahim and Adnan (2019) is a cooperative learning technique in which small groups of learners of varying abilities collaborate to attain a common learning goal. It was developed at Johns Hopkins University by Robert Slavin and his colleagues. STAD is regarded as one of the most researched, uncomplicated, and straightforward cooperative learning methods. It was founded on the achievement of instructional pedagogy. It is utilized to achieve well-defined teaching goals. It is a learning approach in which a small group of learners with varying levels of ability work together to achieve a common learning goal. Students are divided into small groups or teams. The entire class is provided with a lesson, and students are then tested. Individuals are rated based on the performance of the team (Faramarz and Mowlaie, 2017). Although the assessments are done individually, students are urged to collaborate in order to improve

the group's overall achievement. Jamaludin and Mokhtar (2018) noted that it is mostly a team effort, but students are graded individually based on their contributions to their team.

In framing and team assisted individualized instruction strategy, FTAIIS, materials to be learned are arranged and presented in small sequenced units called 'frames' that lead the learner from a body of known concept to unknown. Then from simple to complex concept within the same area, with learners working at their own pace, making frequent responses as they progress through the materials, and receiving immediate information (feedback) about the adequacy of their responses to attain mastery. Cooperative learning teams are direct education designed to meet students' social and academic requirements. In cooperative learning, FTAIIS is a small diverse group of students who learn together at the same pace on framed materials and are rewarded based on the members' success with customised programmed instruction (Gambari and Yusuf, 2017).

The potential effects of STAD and FTAI instructional strategies notwithstandings, there are no indepth studies on its effect on achievement, interest and retention of students in Computer studies especially in Awka Education zone of Anambra state, Nigeria. Also, there are barely any studies that have determined the influence of gender and its interaction with STAD and FTAI on students' achievement, interest and retention. Given that the cooperative structures of STAD and FTAI requires a heterogenous mix of students of different abilities and that gender may influence students' achievement, interest and retention during cooperative learning, the researcher is poised to further explore the influence of gender on students' interest in Computer studies.

Purpose of the Study

The purpose of the study was to determine the effects of two cooperative learning strategies on students' interest in Computer studies in Awka Education zone. Specifically, the study sought to determine the:

1. the mean interest scores of students taught Computer studies using students team achievement division (STAD), framing and team assisted individualized (FTAI) instructional strategy and those taught using lecture method.
2. the mean interest scores of male and female students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method.
3. interaction effect of instructional strategies (STAD, FTAI and lecture method) and gender on students' interest in Computer studies.

Research Questions

1 What are the mean interest scores of students taught Computer studies using students team achievement division (STAD), framing and team assisted individualized (FTAI) instructional strategy and those taught using lecture method?

2 What are the mean interest scores of male and female students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method?

Hypotheses

1. There is no significant difference in the mean interest scores of students taught Computer studies using students team achievement division (STAD), framing and team assisted individualized (FTAI) instructional strategy and those taught using lecture method.
2. There is no significant difference in the mean interest scores of male and female students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method.

Method

The quasi-experimental design, specifically, the pretest-posttest non-randomized control group design was adopted for the study. According to Nworgu (2015), a quasi-experimental design

is used when it is impossible to randomly allocate participants to the experimental and control groups and only intact classes are used. The study was conducted in Awka Education Zone of Anambra State. The population of the study is made up of 4,334 senior secondary year two (SS2) students offering Computer studies in the Awka education zone of the Anambra state. The population comprises 2,812 female students and 1,522 male students.

The sample size for the study is 152 SS2 students drawn from a population of theose offering Computer studies in the Awka Education Zone of Anambra State. To draw up the sample, a multi-stage sampling procedure was used. First, co-educational secondary schools in Awka education zone were listed out as they are in the local government areas. Random sampling technique (balloting with replacement) was used to select three local government areas (Anaocha, Awka North and Njikoka) out of the five local government areas under Awka zone. Secondly, in each of the three local government areas, a school is selected purposive. The reason is to ensure that only those schools offering Computer studies is selected as some offer data processing or ICT. Again, the researcher in choosing the schools ensured that they are far apart to avoid subject interaction. At the third stage, the selected schools are assigned to the two experimental and one control group at random (balloting with replacement). The control group has 51 students (33 males and 18 females), while experimental group one has 54 students (28 males and 26 females) while experimental group two has 47 students (22 males and 25 females).

The instrument for data collection was Computer studies Interest Questionnaire (CSIQ). CSIQ was adapted from Egbo (2019). CIQ is made up of 20 items designed with a four point response options which includes; likes very much (LVM), likes much (LM), Dislike much (DM) to Dislike very much (DVM). CSIQ is structured to generate information on the students' interest in Computer studies activities. Lesson package in form of lesson plans were developed using the three instructional strategies for treatment. The lesson plans have uniform contents except for the activities of the teachers and students and the instructional strategies adopted which includes STAD for experimental group 1, FTAI for experimental group two and CM for control group.

Cronbach Alpha technique was used to determine the reliability of the CSIQ due to its polytomously scored items. Forty (40) students from Community Secondary School Ezinifite which is not in Awka education zone and who were not chosen for the study were given both instruments. The reliability indices were calculated by applying the respective formulae, and the coefficient of internal consistency obtained was 0.82 for CSIQ. The experiment was carried out in two phases. The first phase involved the training of research assistants who were the regular SS2 Computer studies teachers in the experimental schools. The training was carried out in one week comprising three contacts. The second phase consisted of the treatment using the students team achievement division (STAD), framing and team assisted individualized instruction (FTAI) and control groups taught using lecture method. Before the treatment, the instruments, CSAT and CSIQ were administered to the students as a pretest.

In STAD treatment group, the students were divided into groups of five members for the entire class. After assigning students to groups, the last group if less than four was distributed to other groups. In each group, a group head and group assistant was appointed who were replaced each week to give each member a chance of being a group head or at least a group assistance. The group is expected to work cooperatively to master the learning material and receive commendation for the teacher. The teacher introduced the lesson for each week and teaching the students the concepts. After the teaching, students were sent to the teams to study the material and ensure that each team member masters the learning content. The team activities were structured around students studying the material within a given time duration and taking turn to share what they have learnt with other

members of the team. The whole activity was coordinated by the group head and the assisted. After the team activity, students were given evaluation exercise to answer as a team but each student wrote on his or her booklet and get and individual score. The mean of all team members was determined and the best performed team received recognition to motivate further team activity.

In FTAI instructional strategy, the students were placed into teams of eight members with one team head. Frames or unit of the instructional materials were formulated in a sequential order using the instructional objectives and the teachers gave the students general objectives and questions expected to achieve by their end of their study. Each team member study to master all unit within a specific time while seeking the help of team mates using the textbooks and computer systems provided for the instruction. The team head coordinated the team to answer all the questions relating to each unit before returning to the general class to take the evaluation test. The student took evaluation test given by the teacher and thereafter received a certificate reward based on their performance.

The control group was instructed using the traditional instructional strategy involving lecture method. Students were given the information for the lesson and the content of the materials along with a full explanation to make sure they understand it. Students had the chance to ask questions to further their comprehension and clear their confusions. They were taught in the computer laboratory but no use was made of any grouping and students' interaction or any form of cooperative learning strategy. Mean and standard deviation were used to analyze data pertaining to the research questions, and analysis of covariance (ANCOVA) was used to test the hypotheses at a significance level of 0.05. ANCOVA was used to eliminate the initial group differences among the students. The decision criterion is: if the probability value (p-value) is greater than 0.05 ($P>0.05$), do not reject the null hypothesis; otherwise, if P-value is less than or equal to 0.05 ($P\leq0.05$), reject the null hypothesis.

Results

Research Question 1: What are mean interest scores of students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method?

Table 1: Mean Interest Scores of Students taught using STAD, FTAI and LM

Source of Variation	n	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Gained Mean
STAD	54	34.89	6.76	76.91	4.81	42.02
FTAI	47	40.21	7.03	76.49	8.40	36.28
LM	51	40.49	6.99	65.27	5.29	24.78

Table 1 reveals that the students taught Computer studies using STAD had pretest mean interest score of 34.89 and posttest mean interest score of 76.91 with gained mean interest score of 42.02, and those taught using FTAI had pretest mean interest score of 40.21 and posttest mean score of 76.49 with gained mean 36.28 while those taught using lecture method has pretest mean interest score of 40.49, posttest mean of 65.27 and gained mean interest score of 24.78. Students taught using Computer studies using STAD had the most homogeneous score in their pretest (6.76) and followed by those taught using LM (6.99) while those taught using FTAI had the least homogeneous scores in their pretest (7.03). In the posttest, students taught using STAD had a more homogeneous score (4.81), followed by those taught using LM (5.29) where those taught using FTAI had the least homogeneous score (8.40).

Research Question 2: What are the mean interest scores of male and female students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method?

Table 2: Mean Interest Scores of Male and Female Students taught Computer studies using STAD, FTAI and LM

Method	Gender	n	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Gained Mean
STAD	Male	28	34.86	7.11	78.11	5.20	43.25
	Female	26	34.92	6.51	75.62	4.05	40.70
FTAI	Male	22	39.50	6.76	80.23	9.06	40.73
	Female	25	40.84	7.33	73.20	6.27	32.36
LM	Male	33	42.30	6.20	65.94	5.14	23.64
	Female	18	37.17	7.31	64.06	5.49	26.89

Table 2 indicates that male students taught Computer studies using STAD have gained mean interest score of 43.25 while female students have a gained mean score of 40.70. Males students taught Computer studies using STAD had a less homogeneous score in the posttest (5.20) than the female students (4.05). Male students taught Computer studies using FTAI have a gained mean interest score of 40.73 while female students have gained mean score of 32.36. The male students taught Computer studies using FTAI had a less homogeneous score in the posttest (9.06) than the female students (6.27). Again, male students taught Computer studies using LM have a gained mean interest score of 23.64 while female students have gained mean score of 26.89. Male students taught Computer studies using lecture method had a more homogeneous score in the posttest (5.14) than the female students (5.49).

Hypothesis 1: There is no significant difference between the mean interest scores of students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method.

Table 3: ANCOVA on Difference between the Mean Interest Scores of Students taught Computer studies using STAD, FTAI and LM

Source of variation	**SS**	**Df**	**MS**	**F**	**P-value**	**Decision**
Corrected Model	5141.234[a]	6	856.872	24.044	.000	
Intercept	24037.447	1	24037.447	674.505	.000	
Pretest	.129	1	.129	.004	.952	
Method	4315.846	2	2157.923	60.553	.000	Sig.
Gender	526.781	1	526.781	14.782	.000	Sig.
Method * Gender	182.564	2	91.282	2.561	.081	Not Sig.
Error	5167.391	145	35.637			
Total	817545.000	152				
Corrected Total	10308.625	151				

Table 3 shows that there was a significant main effect of the treatment on students' achievement in Computer studies, $F(2, 145) = 60.553$, $P < 0.05$. Therefore, the null hypothesis was rejected meaning that there is no significant difference between the mean interest scores of students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method. The order of the significance of difference in interest was determined using Scheffe PostHoc analysis and presented in Table 4.

Table 4: Scheffe PostHoc on Significant Difference between the Mean Interest of Students in STAD, FTAI and LM Groups

(I) Method	(J) Method	Mean Difference (I-J)	Std. Error	Sig.[b]	Decision
STAD	FTAI	.125	1.252	.921	Sig.
	LM	11.843*	1.244	.000	Sig.
FTAI	STAD	-.125	1.252	.921	Sig.
	LM	11.718*	1.236	.000	Sig.
LM	STAD	-11.843*	1.244	.000	Sig.
	FTAI	-11.718*	1.236	.000	Sig.

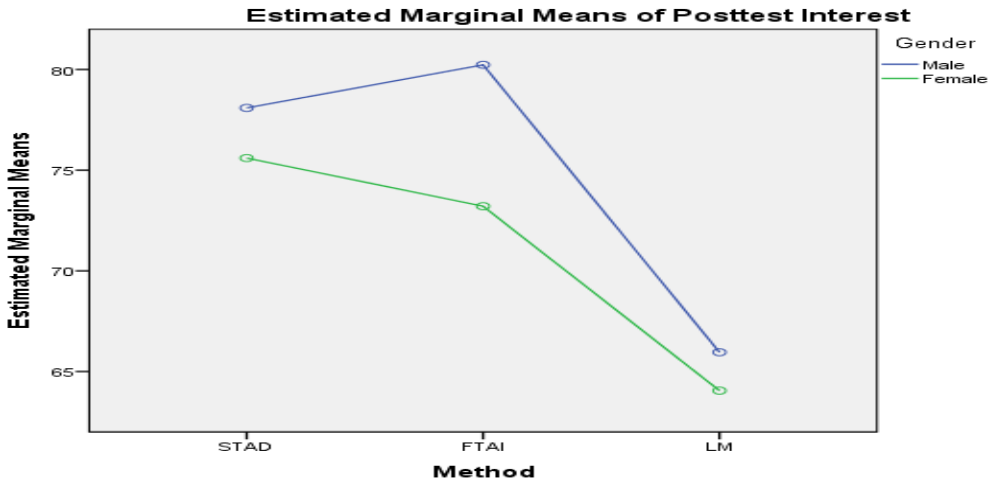
Table 4 reveals that there is no significant difference between the mean interest scores of students taught Computer studies using STAD and FTAI. Table 4 also reveals that a significant difference exists between the mean achievement scores of students taught Computer studies using STAD and LM in favour of STAD. Table 4 further shows that there is significant difference between the mean achievement scores of students taught using FTAI and LM in favour of FTAI. The most effective methods are STAD and FTAI.

Hypothesis 2: There is no significant difference between the mean interest scores of male and female students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method.

Data relating to hypothesis 2 is contained in Table 3. Table 3 shows that there was a significant main influence of gender on students' interest in Computer studies, $F(1, 145) = 14.782$, $P < 0.05$. Therefore, the null hypothesis was rejected meaning that there is a significant difference between the mean interest scores of male and female students taught Computer studies using STAD, FTAI instructional strategy and those taught using lecture method.

Hypothesis 3: There is no interaction effect of instructional strategies (STAD, FTAI and lecture method) and gender on students' interest in Computer studies.

Data relating to hypothesis 3 is contained in Table 3. Table 3 shows that there is no significant interaction effect of instructional strategies and gender on students' interest, $F(1, 145) = 2.561$, $P > 0.05$. Therefore, the null hypothesis was rejected meaning that there is no interaction effects of instructional strategies (STAD, FTAI and lecture method) and gender on students' interest in Computer studies.



Covariates appearing in the model are evaluated at the following values: Pretest Interest = 38.41

Figure 1: Plot of interaction between instructional methods and gender on students' interest in Computer studies

Figure 1 shows that the plot of interaction between instructional strategies and gender on interest in Computer studies. The plot shows that there is an ordinal interaction between instructional strategies and gender on students' interest in Computer studies meaning the instructional strategies are gender-biased towards the male.

Discussion

The finding of the showed that students taught Computer studies using STAD had significantly higher interest than those taught using lecture method. The findings of the study can be explained from the fact that effective study team can help students learn course material in a deeper, more concrete way and thus improve their interest in learning. Study teams that are effective generate positive energy, encourage active participation, instill academic discipline, and require commitments from members. These skills are certainly important for learning. Actively engaging with the material, learning together, and genuinely knowing a subject, make students feel empowered and motivated to do well in the classroom as a group.

Learning is a different experience for each person. Students can hear different perspectives on the subject and therefore understand it from more than one position. A study team can help solidify and clarify learning materials, leading to more promising classroom experiences, and potentially a better academic achievement. By understanding the subject and feeling motivated, students may feel more willing to do better in class, on tests, and on assignments. The resulting overall effect is improvement in learning interest.

The findings of the study is related to the findings of Ugwu (2019) that students exposed to Student Teams-Achievement Divisions program has a significantly better interest than those in the control group. The findings of the study is collaboration Eriba and Iwanger (2018) which revealed significant differences in the interest and achievement of students taught using STAD and Jigsaw IV cooperative learning strategies as against the use of the conventional lecture method for teaching basic science.

The findings of the study also revealed that students taught FTAI has significantly higher interest in learning Computer studies than those taught using lecture method. During team and individualized study, students share ideas and thoughts about a particular subject and therefore become more interested in learning. Through individualized learning, students learn at their own pace and improve significantly in their academic achievement leading to a greater interest in learning. Naturally, some students are more organized and have better time management skills than others. Being a part of a team group will hone these skills for some and help others get a sense for how this can be done in other aspects of their academic endeavours. Again, learning from peers can sometimes be easier than heeding the advice of authority figures like the teacher. The finding of the study is in line with the findings of Agu and Samuel (2018) that there were significant differences in the interest and achievement of students taught using reversed jigsaw, team-assisted instruction, guided discovery instructional strategies and the conventional (lecture) method.

Conclusion

The findings of this study showed that students taught Computer studies using STAD had significantly higher interest score in Computer studies followed by those taught using FTAI. The study concludes therefore that STAD is an effective instructional strategy that arouses and sustains

students' interest. The study also establishes that FTAI is more effective than lecture method in improving students' interest in Computer studies.

Recommendations

Based the findings and conclusion of the study, the following recommendations are made:

1. Effort should be made by Computer studies teachers to facilitate greater collaboration among students by using computer technologies and its corresponding accessories. Such methods as computer assisted STAD and computer supported collaborative or cooperative instructions should be adopted.
2. Secondary school teachers should as often as possible give computer students group Computer studies assignments and project in order to develop in them skills of team study.

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