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IMPACT OF COOPERATIVE LEARNING METHOD ON ACADEMIC ACHIEVEMENT OF PUBLIC SECONDARY SCHOOL STUDENTS IN OGIDI EDUCATION ZONE OF ANAMBRA STATE, NIGERIA

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Abstract
The study examined the impact of cooperative learning method among public secondary school students in Ogidi Education Zone of Anambra State, Nigeria. One research question and one null hypothesis guided the study. Quasi-experimental research design was adopted for the study. The population of the study comprised all the 1,565 SSII Agricultural Science students in all the 40 public secondary schools in Ogidi Education Zone of Anambra State. Purposive sampling technique was used to select the sample for the study. With respect to the foregoing, out of the three Local Government Areas in Ogidi Education Zone, two were purposively selected for the study and one school each from each Local Government Area was sampled. 55 students were selected from each of the two Local Government Areas, making a total sample size of 110 respondents. The instrument used for data collection was Agricultural Science Achievement Test (ASAT). For the pre-test and post-test quasi-experimental design, two groups of respondents were selected- the experimental group (Group A) and the control group (Group B) were selected without random assignment. Group A was exposed to the treatment of cooperative learning while the conventional method was administered to Group B. The research question was analyzed using mean and standard deviation, while the null hypothesis was tested using the inferential statistical tool, the ANCOVA at .05 level of significance. The findings of the study revealed among others that the group taught with cooperative learning method learned faster and adjusted to Agricultural Science compared to their counterparts who were taught with conventional method. Based on the findings, the study concluded that cooperative learning approach enhances academic performance of students in Agricultural Science more than the regular conventional teaching method. The study therefore recommended among other things that teachers in general should be encouraged to use cooperative learning approach as a way of improving their students' achievement in the subject.

Keywords: Cooperative learning, Academic achievement, Secondary school

Introduction

The effect of teaching and learning is seen on student's academic achievement. When the students are assessed and the result showed poor achievement, there is need to find out the causes of the poor academic achievement of the students. Academic achievement of a child is the learning outcome of the child. Wolly (2015) defined academic achievement as the extent to which a student or institution has achieved either short or long term educational goals. Eremie (2018) and Ezeoruonye (2021) asserted that academic achievement is the outcome of education or the extent to which students have achieved their educational goals. Ikegbusi, Eziamaka and Iheanacho (2021) explained that academic achievement entails not only academic knowledge but also acquisition of social, communication, reasoning and collaborative skills, discovery and development of talents, building of self-esteem and confidence, development of critical thinking, building character and also attaining required goal in life. It relates to academic subjects a child studied in school and the skills the child is expected to master in each (Ikegbusi, 2018). Ikegbusi (2019) and Okeke (2021) explained that academic achievement represents performance outcomes that indicate the extent to which a person has accomplished specific goals that were the focus of activities in institutional environments, specifically school, college, and university. It is important for successful development of young people in the society (Ricardo, 2014).

The above reason for academic achievement which is acquired in school is found in cooperative learning method. The conventional method of learning is teacher centred while cooperative learning method is student centred. Secondary school according to Ikegbusi (2016) is the intermediate between elementary school and tertiary institution and usually offering general, technical, vocational or tertiary school preparatory courses. It runs for six years in Nigeria. The period is divided into three years junior secondary and three years senior secondary. Senior secondary school is the upper and last part of secondary school at the end of which a student writes external examinations known as Senior Secondary Certificate Examination (SSCE) organized by West African Examination Council (WAEC) and/or National Examination Council (NECO).

The study of Agricultural Science in schools is of paramount importance for the growth and development of the nation's economy. Akinwande (2014) posited that the overall purpose of the revised curriculum is to provide students with sufficient knowledge and skills that would enable them to explore their talents and enrich agricultural science education in Nigeria. Specifically, the objectives of senior secondary Agricultural education should be to:

i. stimulate and sustain students' interest in Agriculture;
ii. impart functional knowledge and practical skills in agriculture to students;
iii. prepare students for further studies in area of agriculture;
iv. prepare students for occupation in Agriculture.

The increasing need for functional knowledge and skill for productive life shows that agricultural education can add values to the national development of any nation. Agricultural education involves the acquisition of saleable skills and techniques in agriculture and increased productivity both in crops and animals (Akinwande, 2014).

The study of Agricultural Science is not new in the school curriculum yet it does not yield results as expected. This is evident in the way students in senior secondary schools, who have studied the benefits of agricultural science in junior classes where it is made compulsory, still lose interest in the subject and some of those who registered for it performed poorly in Paper 2, which is essay type question, or 3, which is a test of practical knowledge in Agricultural

Science examination, (Chief Examiner's WAEC Report, 2020). Several factors have been identified as being responsible for the poor performance of agricultural science students in senior secondary schools. These factors include lack of interest by students as a result of teaching method during lessons, wrong approach to practical field work by teachers etc. Integration of instruction into real world problems should be the practical result of education especially Agricultural Science.

Cooperative learning is an instructional strategy in which small groups of students work together on a common task. Cooperative learning is an educational tool in which small groups of students work together to increase individual, as well as, group member teaching (Johnson & Johnson, 2011). Cooperative learning exists when students work together to achieve joint learning goals. Any assignment in any curriculum for any age student can be done cooperatively. Advocates of cooperative learning like Chiasom, Okwu, & Kunemeh (2013) stated that the active exchange of ideas within small groups, not only increases students' interest, but promotes critical thinking as well.

The group work makes the students feel responsible for their own work and efforts, the students would encourage and support one another. Each student would be responsible for doing his part and the group would be accountable for meeting its goal. This encourages collaborative skills needed to work with others to achieve academic and practical excellence (Emenogu, 2017). Cooperative learning is an educational approach that aims to organize classroom activities into academic and social learning experiences. Teachers are encouraged to use various types of teaching method in teaching, and cooperative method is one of the methods. They are to use this method of small group work in class and for practical field work. However, there is a need to investigate how beneficial this method of teaching is in terms of the academic achievement of students in Agricultural Science. Slavin (2016) believed the goal of cooperative learning is to encourage students to assist one another to maximize learning. To accomplish this, students must work together to complete a project or master material as a group. Therefore, cooperative learning fosters a collaborative atmosphere as opposed to a competitive environment. Gavin (2013) explained the two most important aspects of cooperative learning that increase student achievement are group rewards and individual accountability. According to literature research conducted by McManus and Gettinger (2019), additional goals of cooperative learning include assuming leadership responsibilities, equal and active participation in the group process, positive interaction, increased learning and improved self-esteem.

What makes cooperative learning different from most instructional methods is that it is based on social interdependence theory and the related research (Yousef & Younis, 2021). Social interdependence theory provides educators with a conceptual framework for understanding how cooperative learning may be (a) most fruitfully structured, (b) adapted to a wide variety of instructional situations, and (c) applied to a wide range of issues (such as achievement, ethnic integration, and prevention of drug abuse etc.)

Emenogu (2017) explained that what teachers soon observe when working with cooperative learning is that working together would offer students the chance to know their classmates better. It also helps to create a better community and therefore a warmer atmosphere in the classroom. Cooperative learning, reducing students' disengagement and favouring the natural needs of students for social interaction instead of contrasting it, helps also minimize classroom management issues

Cooperative learning changes students' and teachers' roles in classrooms. The ownership of teaching and learning is shared by groups of students and is no longer the sole responsibility of the teacher, as no child learns effectively in isolation (Korkmaz & Tay, 2016). There is a

need for teachers to create room for cooperation among students for effective cross-fertilization of ideas and knowledge sharing. This need would be actualized when more students study agricultural science and effectively put their knowledge into action. Musingafi and Rugonye (2014) were of the opinion that practical skills which are among the benefits of cooperative learning helps to raise achievement level of students; this is because students after group work and individual contributions would retain the knowledge learnt during field work and class group discussions. The product of the practical work if adequately monitored also gives student encouragement in addition to the skill acquired. This is lacking in the conventional teaching method used by Agricultural Science teachers. The cooperative learning of students would support the hope of fulfilling the nation's agricultural expectation in terms of provision of food to meet the ever increasing population through schools. The government has in its own way tried to improve the interest of students in agricultural science but the government efforts have not yielded much fruit. WAEC Report 2020 in Agricultural Science showed that the students performed poorly in some of the Agricultural Science papers because they lack proper cooperative participation which is very vital for the development of enduring interests in learning as regards agricultural ethics. Different studies have attempted to analyse the impact of cooperative learning on academic achievement in various subject areas and educational levels. For instance, investigations on the effects of cooperative learning on students' attainment in higher and primary education have established that cooperative learning methods have significant positive effects on students' academic performance than the traditional learning methods. Literature review showed that there is research on cooperative learning for different grades and subject fields; Musingafi and Rugonye (2014), Korkmaz and Tay (2016), Emenogu (2017). No research has been found with the aim of comparing the efficacy of this approach on Agricultural Science in Ogidi Education Zone of Anambra state. Therefore, the present study is regarded as important in providing resourceful findings for future research on whether or not there is any statistically significant difference between the use of cooperative learning method and academic achievement among Agricultural Science students in public secondary schools in Ogidi Education Zone of Anambra State.

Statement of the Problem

In spite of the positive impacts of the cooperative learning method on academic achievements of students at different levels, students do not necessarily develop collaborative work even though placed in groups to work together and teachers do not seem to have proper training on the effective implementation of the cooperative learning intervention.

The above criticisms pose questions concerning the effectiveness and efficiency of the cooperative learning method in education vis a vis academic achievement. As such, these arguments posit a need to better understanding of the concept of cooperative learning in education and ascertain its level of impact on the academic success of students. Thus, can cooperative learning method improve the academic achievement of secondary school students? This research paper was set out to provide answer to this question. The present study, therefore sought to examine the impact of cooperative learning method on academic achievement of Agricultural Science students in public secondary schools in Ogidi Education Zone of Anambra State.

Purpose of the study:

The main purpose of this study is to investigate the impact of cooperative learning method on academic achievement of Agricultural Science students in public secondary schools in Ogidi Education Zone of Anambra State. Specifically, the study sought to:

1. Measure the academic achievement level of students in Agricultural Science when

taught using cooperative teaching method in public secondary schools in Ogidi Education Zone of Anambra State.

Research Question

The following research question guided the study:

1. What is the impact of cooperative learning on the students' mean achievement in Agricultural Science in public secondary schools in Ogidi Education Zone of Anambra State?

Hypothesis

The following null hypotheses were formulated to guide the study:

Ho_1.There is no significant difference in the mean achievement scores of students taught Agricultural Science with cooperative method of teaching and those taught with conventional teaching method in public secondary schools in Ogidi Education Zone of Anambra State.

METHODOLOGY

Quasi-experimental research design was used in carrying out this study. The quasi-experimental research design is an empirical interventional study used to estimate the causal impact of an intervention on target population without random assignment (Nwankwo, 2016). The population of the study comprised all the 1,565 SSII Agricultural Science students in all the 40 public secondary schools in Ogidi Education Zone of Anambra State. Purposive sampling technique was used to select the sample for the study. This is based on recommendation by Nworgu (2015) who stated that purposive sample is selected deliberately to ensure that specific individuals whom the researcher adjudges typical of the population are included in the sample. Here the researchers use their own judgment to select those respondents with the characteristics they consider being typical of the parents population. With respect to the foregoing, out of the three Local Government Areas in Ogidi Education Zone, two were selected for the study and one school each from the Local Government Area was sampled. 55 students were selected from each of the two Local Government Areas, making a total sample size of 110 respondents. This number comprised both male and female and all the SSII Agricultural Science students in the schools. The instrument used for data collection was Agricultural Science Achievement Test (ASAT).

For the pre-test and post-test quasi-experimental design, two groups of respondents were selected: the experimental group (Group A) and the control group (Group B) were selected without random assignment. All types of students were considered including students with learning disabilities. Group A was exposed to the treatment of cooperative learning while the conventional method was administered to Group B. The control and experimental groups were made to study in the same class and afterwards split into two groups on the basis of the pre-test.

To assess the impact of the learning methods, both groups were taught in two consecutive periods by a single teacher. This was to control the effect of teacher quality. Both groups were taught the same topic using the same content outline as provided in the curriculum. The content was taught to the experimental group through multiple activities designed to provide them with the cooperative learning experience. Almost all the activities were carried out in groups.

In a bid to ensure the heterogeneity of the sample selected, five groups containing six members each were formed for each activity. The groups were formed by assigning numbers (1-5) to each individual; after which each person with number 1 form group one, number 2 from group two, while those with number 3 made up groups three and so on. Activities were designed in

view of the STAD (Student Team Achievement Division) and Think-Pair-Share. Mean and standard deviation were used to answer the research question while the inferential statistical tool, the ANCOVA used to test the null hypothesis at .05 level of significance.

Presentation and Analysis of Data

Research Question 1: What is the impact of cooperative learning on the students' mean achievement in Agricultural Science in public secondary schools in Ogidi Education Zone of Anambra State?

Table 1: Mean and Standard Deviation of pre-achievement test and post–achievement test scores of students in Agricultural Science in public secondary schools in Ogidi Education Zone of Anambra State

Variable		Pre-test		Post-test		
Method of teaching	**N**	**X**	**SD**	**X**	**SD**	**Mean gain**
Cooperative learning	55	51.34	16.92	71.72	15.58	20.38
Conventional method	55	39.45	12.49	53.36	15.72	13.91

N= 110

Results table 1 showed that the group taught Agricultural Science with cooperative learning method had a pre-test mean of 51.34 and a post-test mean of 71.72, and the difference between pre-test and post-test mean was 20.38. The group taught Agricultural Science using conventional method had a pre-test mean of 39.45 and a post-test mean of 53.36. The difference between pre-test and post-test mean was 13.91. However, for each of the groups, the posttest means were greater than the pre-test means. This indicated that cooperative learning method had more effect on students' academic achievement than the conventional method.

Test of Hypothesis

Hypothesis 1: There is no significant difference in the mean achievement scores of students taught Agricultural Science with cooperative method of teaching and those taught with conventional method of teaching in public secondary schools in Ogidi Education Zone of Anambra State

Table 2: Analysis of Covariance (ANCOVA) of the significant difference in the mean achievement scores of students taught Agricultural Science with cooperative method of teaching and those taught with conventional method of teaching in public secondary schools in Ogidi Education Zone of Anambra State

Type III Sum	Source of squares	df	Mean squares	F	Sig.
Corrected Model	11382.985[a]	43	264.721	1.685	.176
Intercept	2554.434	1	2554.434	16.262	.002
Pre-test	1247.076	1	1247.076	7.939	.017
Gender	1453.479	14	103.820	.661	.030
Groups	3743.172	12	311.931	1.986	.033
Gender + Groups	2393.597	16	149.600	.952	.546
Error	1727.924	11	157.084		
Total	**222675.000**	**55**			
Corrected total	**13110.909**	**54**			

The result in table 2 showed that with respect to the group taught Agricultural Science using cooperative learning method and those taught using conventional method, an F-ratio of 1.986 was obtained with associated p-value of .033. Since the associated p-value was less than .05 level of significance, the null hypothesis was rejected. Thus, the inference drawn therefore was

that there was a significant difference in the mean achievement scores of students taught Agricultural Science using cooperative learning method and those taught using conventional learning method, with those taught using cooperative learning method having a higher mean achievement gain. This showed that cooperative learning method increased students' academic achievement in Agricultural Science than the conventional method of teaching in public secondary schools in Ogidi Education Zone of Anambra State.

Discussion of Findings

The study found that the group taught with cooperative learning method learned faster and adjusted to Agricultural Science compared to their counterparts who were taught with conventional learning method. This result agreed with Yousef and Younis (2021) who reported that cooperative learning method increased academic achievement of students in Mathematics for elementary school students in Northern Israel as compared to those who were taught through the traditional teaching approaches. The study results showed that the results of students' academic achievement in Mathematics using the cooperative learning method were better than the results of students' academic achievement in Mathematics using the traditional learning method. This indicated that cooperative learning method had a positive impact on students' academic achievement than the conventional learning method. Again, Korkmaz, T. S. and Tay, (2016) concluded in their study on "The effect of cooperative learning method and systematic teaching on students' achievement and retention of knowledge in social studies lesson" that the cooperative learning method (experiment 1), and the systematic teaching (experiment 2), and constructivist learning approaches (control groups 1 and 2) increased the level of students' achievement significantly and positively and had a positive impact on the retention of the knowledge students learned. Thus the findings of the present study are in agreement of the findings of the previous study. This is further reflected in null hypothesis as tested in table 2 which the result indicated a significant relationship between cooperative learning method and academic achievement of Agricultural Science students in public secondary schools in Ogidi Education Zone of Anambra State. The findings of the present study also agreed with the findings of the study by Emenogu (2017) which revealed that cooperative learning has a positive relationship with the academic achievement of the male and female students in secondary schools' Mathematics**.**

Conclusion

This study found that the cooperative learning approach promotes higher academic achievement of secondary school students in Agricultural Science as compared to the regular conventional teaching methods. The approach also enhanced higher academic achievement of secondary school students in Agricultural Science at knowledge, comprehension and application levels of the cognitive domain as compared to the regular conventional teaching method. Therefore, cooperative learning approach enhances academic achievement of students in Agricultural Science more than the regular conventional teaching method.

Recommendations

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

1. Teachers in general should be encouraged to use cooperative learning approach as a way of improving their students' academic achievement in their various subjects.
2. The findings from this study should find a place in the body of knowledge on cooperative learning approach. The education scholars and particularly specialists in instructional approaches who advocates for active learning strategies, should find an additional voice

and companion from these findings. This study is an additional input towards active pedagogy.

3. In-service and pre-service teacher education training programmes in Nigeria should incorporate cooperative learning approach. This would ensure that teachers are well grounded on effective teaching and learning approaches for higher academic achievement in these subjects which are the cornerstone for socio-economic development of the society.

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