

Effect of Peer-Led Team Learning Approach On Students' Academic Performance in Basic Science in Ekiti State Secondary Schools

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Abstract:

The study investigated the effect of peer-led team learning approach on students' academic performance in Basic Science in Ekiti State secondary schools. This study adopted a pre-test-post-test experimental-control group design. The targeted population was the junior secondary school three (JSS III) students in public secondary schools in Ekiti State. The sample for this study consisted of 141 students which were selected from 4 secondary schools in Ekiti State. The sample was selected through multi stage sampling procedure. Basic Science Achievement Test (BSAT) designed by the researcher was used data collection. The instrument was validated by the research before it was used for data collection. The experimental procedure was carried out in three stages namely pre-treatment, treatment, and post0treatment stage. Inferential statistics of t-test was used for analysis of data. The result of findings revealed that the students in the two groups were homogeneous at the commencement of this study while there was significant difference in the post-test mean scores of students exposed to Peer-led team learning approach and conventional method. There was no gender difference in student responses to both peer-led team learning approach and conventional method. It can be concluded from the findings of this study that peer-led team learning approach is effective in improving the Ekiti state secondary school students' academic performance in Basic Science. It was recommended among others that Basic Science teachers should be encouraged to adopt peer-led team learning approach as a strategy of teaching Basic Science.

CJAR

Accepted 20 June 2022

Published 30 June 2022

DOI: 10.5281/zenodo.6863704



Keywords: Peer-led Team Learning Approach, Conventional Method, Academic Performance, Students, Basic Science,

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Introduction

The 21st century is characterized by advancement in science and technology. Science is the basis and fundamental pillar behind any advanced country. For Nigeria to realize radical development in the 21st century, she needs qualitative science education in our schools specifically in junior secondary schools. Over the last two decades, there have been recurrent calls for transformations and innovations aimed at improving science education in Nigeria. This submission based on the recommendation that there are issues in science education in Nigeria that needs to be improved upon.

Science Education is a field of study concerned with producing a scientifically literate society. It acquaints students with certain basic knowledge, skills and attitudes needed for future work in science and science related fields. Okebukola (2007) describes science education as the provision of learning experiences in science in formal, non-formal and informal settings. Although there are several issues in science education in Nigeria, the following areas of emphasis have been identified for discussion: students' performance in science and some factors influencing poor performance which include Quality of Teaching, Teacher Quality and its indicators and Quality teaching learning resources.

Science is a body of organized knowledge and a process of inquiry that is geared towards understanding of nature through observation and experimentation in order to enhance the standard of living standard of man. Many scientists define science according to their own view, perception and understanding of the subject matter. Science is an intellectual activity carried out by humans that is designed to discern information about the natural world in which humans live and to discover the ways in which this information can be organized into meaningful patterns. Omotayo (2010) defined Science as the bedrock that offers sustainable national development by protecting human society from ignorance, illiteracy, disease and poverty.

Integrated Science (now Basic Science) was introduced to Nigerian secondary schools in 1972 at the junior secondary school level as a result of the outcome of Science Teachers Association of Nigeria (STAN) Committee set up to look into the three (3) sciences i.e. Biology, Chemistry and Physics. At junior secondary school level Integrated Science was introduced for the purpose of giving foundation skills and knowledge for subsequent science studies at the higher level.

Basic Science is an important subject in junior secondary school curriculum and it deepens man's future to a large extent base on scientific advances & development of productive activity. Hence there is a great need to teach Basic Science in school curriculum. Cherkesova (2016) stated that Basic Science influences the formation of the philosophical world outlook and worldview principles, which expand the theoretical, conceptual notions of the surrounding world, the universe in all their manifestations, including those encompassing the intellectual, spiritual and social sphere.

Basic Science is taught in most Nigerian schools today predominantly by using the traditional method, commonly known as lecture method, most Basic science teachers do not encourage student's active participation in the teaching and learning process. The use of inappropriate teaching strategy and lack of adequate instructional materials have been a major challenge to effective teaching of the subject. Researcher observed a persistent poor academic performance of students in Basic Science in spite of government huge expenditure on education. The poor performance in science subjects is partly as a result of the way in which the teachers teach the subject.

The acquisition of appropriate skills and the development of mental, physical and social abilities and competencies for the individual to live in and contribute to the development of the society in which he lives, has been a major concern of Basic Science. The subject views nature in a holistic approach and this makes it a discipline in its own right. The above definitions show that science is not just a collection of data and facts neither is it an assembly of sterile body of knowledge but that, it involves engaging in certain activities as well.

Teaching methods are the general principles, pedagogies and management approaches used in an ideal classroom instructional process to ensure that learning take place. The quintessence of teaching is to acquired knowledge and skills. To achieve this, appropriate methods of teaching are expected to be used. In support of this Arubayi (2010) observed that pedagogy is the backbone of teaching and learning process, he stressed further that the aims and objectives of teaching and learning process cannot be achieved unless teaching method is diversified.

Research into Basic Science pedagogies is a recent development in Nigeria, although some research efforts have been documented. However, in spite of these research and literature available, it appears one of the common teaching methods that Basic Science teachers prefer is the lecture method. In this the teacher transmits knowledge to the students who sit passively in the classroom and listen.

Student's conceptual understanding and academic performance tends to be improved through the use of innovative and students-centered pedagogy. When students are properly engaged in the classroom, they tend to show greater interest and participation in lessons thus leading to better performance (Carini, Kuh & Klein, 2013).

Peer-led team learning approach is learner centered or activity oriented approach employs in the processes of science in gathering, transforming and interpreting data, a major objective of teaching sciences in the secondary school. Peer-led team learning approach is a collaborative teaching method that allows students learn actively in their own pace under a small group. In the same vein Venile and Dawson (2010) submitted that students should play an active role in developing an understanding of concept being studied through constructing their own knowledge. In line with the above submission, Wells (2012), reported that student have better conceptual understanding of evolution in biology using peer-led team learning approach during teaching and learning process, this had resulted to student's high performance in Biology. This study is linked with Vygotsky's Social Learning Theory. Vygotsky (1978) submitted that collaboration with other learners may guide the learner in attaining the level of cognition that would not be possible without working with more capable peers. This study investigates why peer-lead team learning approach would improve student's academic performance in Basic Science.

The purpose of this study is investigated the effect of Peer-led team learning approach on students' academic performance in Basic Science in Ekiti State secondary schools. Also, the study finds out the influence of gender on the academic achievement of students taught using peer-led team learning approach.

Research Hypotheses

The following null hypotheses were put forward in an attempt to achieve the objectives of the study.

H₀1: There is no significant difference in the pre-test mean scores of students exposed to Peer-led team learning approach and conventional method.

H₀2: There is no significant difference in the post-test mean scores of students exposed to Peer-led team learning approach and conventional method.

H₀3: There is no significant gender difference in the post-test scores of students exposed to Peer-led team learning approach.

H₀4: There is no significant gender difference in the post-test scores of students exposed to conventional method.

Methodology

This study adopted a pre-test-post-test experimental-control group design. Both the experimental and control groups were pretested before the treatment with Peer-led team learning approach was administered. After the treatment, the experimental and control groups were post-tested. The independent variables are two levels of instructional modes (Peer-led team learning approach (PTLA) and conventional method). The dependent variable is Academic performance in Basic Science, while two levels of Gender (male and female) stood as moderating variables in this research. The population of this study was all the students in secondary schools in Ekiti State. The targeted population was the junior secondary school three (JSS III) students. The sample for this study consisted of 141 students which were selected from 4 secondary schools in Ekiti State. The sample was selected through multi stage sampling procedure.

The researcher personally constructed a Test Instrument called Basic Science Achievement Test (BSAT) for the purpose of collecting data for the study. The Basic Science Achievement Test (BSAT) was a twenty (20) item multiple-choice objective test, five (5) options (A - E) with the right answer attached to each item. The items were constructed based on the concepts treated and the instructional objectives of the lessons designed. On the scoring of the test items, a score of five (5) marks was awarded for each correct answer and zero (0) for each wrong answer. Thus, the test was scored over one hundred (100).

The items of the Basic Science Achievement Test (BSAT) were made to pass through junior secondary school curriculum in Basic Science to ascertain its validity. Generally, their comments and opinions were solicited for necessary moderation. The test items were corrected and modified according to opinions and comments of these experts. Therefore, based on the moderation, the test instrument was found to be valid. To find out how reliable the test instrument was, the researcher adopted a test-retest method by administering the test to the students of one Secondary School, which was not part of the main study. An interval of two weeks was used to administer the same test to the students who participated in the previous one. The two sets of scores were correlated using Cronbach's Alpha Method and the result obtained revealed a reliability coefficient $r = 0.78$, which was considered to be very adequate for this research work.

Two weeks before the experiment, the researcher visited the selected schools to seek for official permission from the school authority. The entire study covered a period of seven (7) weeks. During the first week of experiment, pre-test was administered to all the groups before treatment to determine the equivalence of both the experimental and control groups. Therefore, actual teaching of all the groups had begun in the second week of the experiment. The experimental group was taught using Basic Science Achievement Test (BSAT) while Lecture Method was used for the control group. Lessons on the content areas were presented for four (4) weeks using double period of eighty (80) minutes per week, which gives a total of five (5) hours and twenty (20) minutes per school. After a period of four (4) weeks, there was a one week of revision and Basic Science Achievement Test (BSAT) was finally administered



as post-test. The scores of the experimental and control groups on pre-test and post-test were computed and used for data analysis.

Inferential statistics of t-test was used to analyze the data obtained from the Basic Science Achievement Test (BSAT) administered to both the experimental and control groups. A significant level of 0.05 was adopted for all the analysis. Statistical Package for Social Sciences (SPSS 27.0 version) was used for the analysis.

Test of Hypotheses

Hypothesis 1: There is no significant difference in the pre-test mean scores of students exposed to Peer-led team learning approach and conventional method.

Table 1: t-test analysis of pre-test scores of students exposed to Peer-led team learning approach and conventional method

Variations	N	Mean	SD	df	t-cal	P
Peer-led team learning approach	69	8.88	2.09	139	0.478	0.714
Conventional	72	8.71	2.13			

$P > 0.05$

Table 1 shows that the t-cal value of 0.478 is not significant because the p-value of 0.714 is greater than 0.05 level of significance, this implies that null hypothesis is not rejected. Hence, there was no significant difference in the pre-test mean scores of students exposed to Peer-led team learning approach and conventional method. Since there was no significant difference between the pre-test score of both groups, it shows that students in the two groups were homogeneous at the commencement of this study.

Hypothesis 2: There is no significant difference in the post-test mean scores of students exposed to Peer-led team learning approach and conventional method.

Table 2: t-test analysis of post-test scores of students exposed to Peer-led team learning approach and conventional method

Variations	N	Mean	SD	df	t-cal	p
Peer-led team learning approach	69	17.20	4.57	139	9.954*	0.000
Conventional	72	10.19	3.73			

* $P < 0.05$

Table 2 shows that the t-cal value of 9.954 is significant because the p-value of 0.000 is less than 0.05 level of significance, this implies that null hypothesis is rejected. Hence, there was significant difference in the post-test mean scores of students exposed to peer-led team learning approach and conventional method. The mean score showed a large difference of 7.01 in favour of peer-led team learning approach.

Hypothesis 3: There is no significant gender difference in the post-test scores of students exposed to peer-led team learning approach

Table 3: t-test analysis of gender difference of post-test scores of students taught using peer-led team learning approach

Variations	N	Mean	SD	df	t-cal	P
Male	32	17.23	3.07	67	0.071	0.952
Female	37	17.17	3.96			

$P > 0.05$

Table 3 shows that the t-cal value of 0.071 is not significant because the p-value of 0.952 is greater than 0.05 level of significance, this implies that null hypothesis is not rejected. Hence, there was no significant gender difference in the post-test scores of students exposed to peer-led team learning approach

Hypothesis 4: There is no significant gender difference in the post-test scores of students exposed to conventional method.

Table 4: t-test analysis of gender difference of post-test scores of students taught using conventional method

Variations	N	Mean	SD	df	t-cal	P
Male	32	10.13	2.74	70	0.209	0.833
Female	40	10.27	2.92			

$P > 0.05$

Table 4 shows that the t-cal value of 0.209 is not significant because the p-value of 0.833 is greater than 0.05 level of significance, this implies that null hypothesis is not rejected. Hence, there was no significant gender difference in the post-test scores of students exposed to conventional method.

Discussion

The major aim of this study was to find out whether peer-led team learning approach provides better students' academic performance in Basic Science than the conventional method of teaching. It was found that peer-led team learning approach provides a better teaching learning experience in Basic Science because there was significant difference in the post-test scores of students taught Basic Science in favour of peer-led team learning approach. Thus, this result confirms that the group taught Basic Science with peer-led team learning approach performed better than the group taught with conventional method. The result of this study is supported by the earlier findings of Wang (2010), Murray (2009) and Jang (2016) who proved that peer-led team learning approach improved the academic achievement of students more than the peer-led team learning approach.

The reason that may have made peer-led team learning approach in this study effective is the fact as reported by Wadkins, Wozniak and Miller (2014) that peer-led team learning approach provide valuable learning experiences and increased student-teacher interaction. Again, the findings go to buttress the theory that when the tasks are divided, team members give and receive moral support as they discuss ideas and processes for improved instruction for their students.

Another major finding of this study is that there is no gender difference in academic achievement in Basic Science when taught with peer-led team learning approach and conventional method. This finding contradicted Murray (2009) who reported that females perform better in languages than the males while males do better in science oriented courses. However, the findings of this study is in line with Wang (2010) who reported that gender was not found to be a factor in the peer-led team learning approach because both male and female students exposed to the method showed no significant difference in their mean achievement.

Conclusion

It can be concluded from the findings of this study that peer-led team learning approach is effective in improving the Ekiti state secondary school students' academic performance in Basic Science. Peer-led team learning approach is more effective than conventional method of teaching Basic Science in Ekiti state. Furthermore, there is no gender

difference in student responses to both peer-led team learning approach and conventional method.

Recommendations

Based on the conclusion, it is hereby recommended that:

1. Basic Science teachers should be encouraged to adopt peer-led team learning approach as a strategy of teaching Basic Science.
2. Many teachers are ignorant of the numerous advantage peer-led team learning approach will contribute to their professional development, so relevant government bodies should organize workshops, conferences and seminars to educate them.

References

- Arubayi, D.O (2010) Teaching of Clothing and textiles in Tertiary Institution. An Appraisal of Course Objectives and Content, *Studies in Home and Community Science, Kanla Raj enterprise*; 4 (1) 51.
- Carini, R., Kuh, G., & Klein, S. (2013). Students engagement and student learning: Testing the linkages. *Research in Higher Education*.
- Cherkesova, L.V. (2016). Problem sovremennoi fundamentalnoi nauki (problems of modern fundamental science). Moscow: publishing house of academy of Natural history. (in Rus.)
- Jang, S.J. (2016). Research on the effects of peer-led team teaching upon two secondary school teachers. *Educational Research*, 48:2. 177-194.
- Murray, S. (2009). Effects of Peer-Led Team Teaching on Students' English Achievement. *The Journal of Educational Research*, 102(3), 3-12
- Okebukola, P. (2007). Science Technology and Mathematics Education for sustainable development. *Keynote Address at Golden Jubilee Anniversary Conference Science Teachers Association of Nigeria (STAN) Sokoto*.
- Omotayo K.A. (2010) Acquisition, improvisation and maintenance of science Apparatus. *In science Education and science Teaching methods series 1* (Jegede and Omotayo Eds) Ado – Ekiti, Nigeria. Greenline Publishers.
- Venville, G.J & Dawson, V.M. (2010). The impact of a classroom intervention on grade 10 students' argumentation skills, informal reasoning and conceptual understanding of science. *Journal of research in science teaching*, 47(8), 952-977
- Vygotsky, L.S. (1978) *mind in society: The development of higher psychological processes*. London, England: Harvard University Press.
- Wadkins, T.; Wozniak, W. & Miller, R.L. (2014). Team teaching: Models in E.G. Peck (Ed), *UNK/CTE Compendium of Teaching Resources and Ideas* 77-95 Kearney: University of Nebraska at Kearney.
- Wang, D. (2010). Peer-Led Team Approach and the Appreciation in the English Language Course Teaching. *Journal of Language Education*, 3(1), 89-93.



Cite this article:

Author(s), OKEYA, Abiodun Emmanuel, (2022). "Effect of Peer-Led Team Learning Approach On Students' Academic Performance in Basic Science in Ekiti State Secondary Schools", **Name of the Journal:** Commonwealth Journal of Academic Research, (CJAR.EU), P, 1- 9. DOI: <http://doi.org/10.5281/zenodo.6863704> , Issue: 6, Vol.: 3, Article: 1, Month: June, Year: 2022. Retrieved from <https://www.cjar.eu/all-issues/>

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