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EFFECT OF RECIPROCAL PEER TUTORING ON STUDENTS' INTEREST AND PERFORMANCE IN BASIC SCIENCE IN KADUNA STATE

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ABSTRACT
The study investigates the effect of Reciprocal Peer Tutoring on Students Interest and Performance in Basic Science. The study was guided by two research questions and two hypotheses. Quasi experimental design was adopted in the study. Population of the study was 23,450 upper basic II science students in Kaduna State. Sample of 67 randomly selected students participated in the study. Instruments for data collection were Basic Science Interest Inventory (BSII) and Basic Science Performance Test (BSPT). The BSII and BSPT were validated by experts in Science Education and Educational Psychology. Reliability coefficient of 0.77 was obtained for BSII using Cronbach's alpha while 0.69 was obtained for BSPT using split half method. Data for the study were analyzed using mean, standard deviation, and independent sample t-test at 0.05 level of significant. Findings of the study revealed a significant difference in post-test mean scores of interest and performance of students taught Basic Science concept using RPT and those taught using the expository method. Based on the research finding the study recommends the adoption of RPT by science teachers in teaching basic science to enhance students' interest and performance in basic science.

Keywords: Reciprocal Peer-Tutoring, Interest, Performance and Basic Science

Introduction
Teaching and learning go hand in hand, teaching is the assistance, guidance, direction rendered to learners to discover self, not a mere lip service but most respected profession. The teachings that go on in most of our schools are dominated orally(Okereke, 2024). Basic Science is a necessity for Science and Technology development in Nigeria. Basic Science is a subject that cut across the boundaries of Agricultural Science, Biology, Chemistry, Geography and Physic, which express the fundamental unity of science meant for preparing students with basic knowledge which would enhance their comprehension of science at senior secondary school (Okereke, 2024).

Basic Science is a subject taught in public and private schools at the upper basic level in Nigeria. The reason for teaching Basic

Science according to Federal Republic of Nigeria (FRN, 2013), is that, it widens the knowledge of the students to enables them to appreciate the unity among science subjects such as, Agricultural Science, Biology, Chemistry and Physics.

Nigerian Educational Research and Development Council (NERDC, 2007) stipulates that the objectives of the basic science curriculum are to enable learners develop interest, acquire basic knowledge, skills in science and skills to meet societal needs, take advantage of the numerous career opportunities offered by science, become prepared for further studies. Gambo (2019) stated that requirement for increase is the ability is to work as a team. To achieve this teachers should use diverse teaching methods such as expository, cooperative learning, collaboration, discussion, Dalton Instructional model, inquiry, reciprocal peer tutoring, demonstration and many more, among all these, the most widely practiced is expository strategy. Moreover Udo (2016) is of the opinion that students poor performance in basic science was due to insufficient instructional materials, negative attitude towards subject, interest, unqualified/ not subject teachers and ineffective strategies of teaching employed by teachers.

In spite of the research finding many students perform poorly in external examination. For instance students' performance in basic science as reported by Kaduna Education Resource Department (KERD) for 2016 – 2022 in Basic Education Certificate Examinations (BECE). It is generally observed that in the years under consideration the percentage pass in basic science have been consistently fall below 50% except 2019. It is in light of this continuous poor performance of students in basic science that the present study aims at find the effect of Reciprocal Peer-Tutoring on students' interest and performance in basic science in Kaduna State.

Reciprocal Peer-tutoring is an approach where two or more learners alternate and share their ideas with each other in the class. Peer tutoring is the process in which skilled and trained students help and support other students who are less skilled or have low level of knowledge in an interactive, meaningful and organized way. Ullah, Tabassum and Kaleem (2018) stated that Peer tutoring is useful in learning new skills, knowledge and solutions to each other's problems by playing, talking, quarreling and sharing ideas as students will perform better in their examination.

Interest is a kind of awareness preference for understanding the world and acquiring cultural and scientific knowledge. When students are interested in a certain field they pay more attention in learning the subject. Shehu (2021) states that interest arouses students like in learning a subject through various enhance intervention methods and basic science conceptual knowledge and techniques better, form the scientific spirit and attitude. Godpower and Ihenko (2017) states that improved interest would enhance upper basic students' ability in solving problems and critical thinking skills.

Students lack of interest in basic science results to their poor performance more so several perspectives includes role of students, teachers, school environment, society, government and so on.

In view of the KERD examiner's reports as outlined, the present study examines the effect of Reciprocal Peer-tutoring to enhance student interest and performance in basic science.

Objectives of the Study

The study determines the effect of Reciprocal Peer- tutoring on students' interest and performance in basic science and specifically sought to investigate the:

i. Effect of Reciprocal Peer-tutoring on students' interest in basic science.
ii. Effect of the Reciprocal Peer-tutoring on students' performance in basic science.

Research Questions

i. What is the difference in the mean interest score of students taught basic science using reciprocal peer-tutoring and those taught using expository method?
ii. What is the difference in the mean performance score of students taught basic science using reciprocal peer-tutoring and those taught using expository method?

Hypotheses

i. **$H0_1$**: There is no significant difference in the mean interest score of students taught basic science using reciprocal peer-tutoring and those taught using expository method.
iii. **$H0_2$**: There is no significant difference in the mean performance score of students taught basic science using reciprocal peer-tutoring and those taught using expository method.

Research Method

The study employed quasi experimental design of non-equivalent pre-test, post-test groups. The population comprised of 23, 450 upper basic II students in Kaduna State. Sample of 67 students who participated in the study was obtained using simple random sampling techniques. Instruments for data collection were the Basic Science Interest Inventory (BSII) and Basic Science Performance Test (BSPT). Validity of the BSII and BSPT were ascertained by experts in Science Education and Educational Psychology. Reliability coefficient of 0.77 was obtained for BSII using Cronbach's alpha while 0.69 was obtained for BSPT using split half and Spearman Brown formula. Data for the study were analyzed using mean, standard deviation and independent sampled t-test at 0.05 level of significant.

Results and Analysis

Research Questions 1: What is the difference in the mean interest score of students taught basic science using reciprocal peer-tutoring and those taught using expository method?

Table 1: Pre-test and Post-test Mean Interest Score of Students taught Basic Science Concept Using Reciprocal Peer-tutoring and those taught using Expository Method

Treatment	N	Mean Pretest	SD Pretest	Mean Difference Pretest	Mean Posttest	SD Posttest	Mean Difference Posttest
RPT	35	57.24	8.44		72.54	6.39	
				1.45			14.44
EM	32	58.69	7.72		58.97	7.68	

Table 1 gives the pre-test mean interest score of students taught basic science using reciprocal peer-tutoring as 57.24 and standard deviation of 8.44 while the pre-test mean score of taught using expository method is 58.69 and standard deviations of 7.72. The post-test mean interest score of 72.54 and standard deviation of 6.39 was obtained for reciprocal peer-tutoring while post-test mean score of 58.97 and standard deviation of 14.44 was for expository method. High post-test mean score associated with reciprocal peer tutoring indicates that improves students' performance in basic science than expository method.

$H0_1$: There is no significant difference in the mean interest score of students in basic science when taught using Reciprocal peer-tutoring and those using expository method.

Table 2: Post-test Independent Sample t-test of Students Interest Scores According to Treatment (Reciprocal Peer Tutoring Strategy and Expository Method)

Treatment	N	Mean	SD	Df	t-test	P-value	Decision
RPT	35	72.54	6.39				
				68	9.252	.000	Not accepted
ES	32	58.97	7.68				

Table 2 gives the independent sampled t-test value as t = 9.252, with p-value of 0.000 < 0.05 level significant the null hypothesis (H_{01}) is therefore rejected hence there is a statistical significant difference in the mean interest score of students in basic science when taught using Reciprocal peer-tutoring and those using expository method.

Research Question 2: What is the difference in mean performance score of students taught basic science using reciprocal peer-tutoring and those taught using expository method?

Table 2: Post-test Mean Difference between Students taught Basic Science Concepts using Reciprocal Peer Tutoring and those taught using Expository Method

	Pre-test				Post-test		
Group	**N**	**Mean**	**SD**	**Pre-test Mean Difference**	**Mean**	**SD**	**Post-test Mean Difference**
RPT	35	48.30	14.04	1.67	68.70	11.60	7.56
EM	32	46.63	12.08		61.14	10.38	

Table 2 gives pre-test mean performance score of 48.30 with standard deviation of 14.04 for the reciprocal peer tutoring while pre-test mean performance score of 46.63 with standard deviation of 12.07 as obtained for the expository group. Post-test mean performance score of 68.70 with standard deviation of 11.59 for reciprocal peer tutoring and post-test mean performance score of 61.14 with standard deviation of10.38 indicating reciprocal peer tutoring enhances students' performance in basic science.

$H0_2$: There is no significant difference in the mean performance score of students taught basic science using Reciprocal Peer-Tutoring and those taught using Expository Method.

Table 4: Independent Sample t-test for Post-test of Students Mean Performance Scores According to Treatment (Reciprocal peer-tutoring and Expository Method)

Group	**N**	**Mean**	**SD**	**t-test**	**P-value**	**Decision**
RPT	35	68.70	11.60			
				2.955	.004	H_{02}
EM	32	61.41	10.38			Rejected

Table 4 gives the independent sample t-test value of t = 2.955 with p 0.004 < 0.005.The null hypothesis (H_{02}) is therefore rejected hence there is a statistical significant difference in post-test mean performance scores of students taught basic science using reciprocal peer tutoring and those taught using expository method. This result implies reciprocal peer tutoring improves students' performance in basic science as compare to the expository method.

Discussion of Findings

Finding of the study indicates that reciprocal peer-tutoring is more effective in teaching basic science. Results reveals improvement in students' interest and performance in basic science as a result of reciprocal peer tutoring this is line with study of Gambo (2019) who found a significant difference in the mean interest and performance of students in basic science.

Conclusion

Based on the finding of this study, it is concluded that reciprocal peer tutoring has

positive effect on students' interest and performance of basic science. This therefore means that the implementation of reciprocal peer tutoring would improve students' deep understanding in basic science.

Recommendations

Based on the finding of this study the following recommendations were drawn:

i. The use of reciprocal Peer Tutoring in teaching basic science should be encouraged and imbibed by basic science teachers in upper basic levels
ii. School principals through the heads of departments should encourage Basic science teachers to make use of reciprocal Peer Tutoring in their classrooms since it improves students' interest, performance and understanding of the subject.

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