

Effect of Peer-led Team Teaching on Pupils' Academic Performance in Numeracy in Moro Local Government Area of Kwara State

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Abstract: *The study was carried out to find out the effect of peer-led team teaching on Academic Performance of Pupils in Numeracy in Moro Local Government Area of Kwara State. The study employed pretest-posttest control group quasi experimental research design. The first two levels are one experimental group (peer-led team teaching) and one control group (conventional method), the second factorial level was based on gender that is male (M) and female (F), while the third factorial level focused on school type (public and private). The population of this study comprised all private and public primary schools in Moro Local Government Area of Kwara State. Sample size for the study was four primary three classes. The multistage sampling techniques were used. The purposive sampling technique used to select four mixed primary schools (Boys and Girls schools). The instrument for data collection for this study were Pupils' Numeracy Performance Test (PNPT), Some items for the PNPT were constructed by the researcher and it consisted of twenty questions, based on the primary three numeracy. The instruments were subjected to face and content validity. Reliability coefficient was also obtained. Descriptive statistic (frequency count, mean and percentage) and inferential statistics of Analysis of Covariance (ANCOVA) were used to analyze the data. The results among others showed that, there was significant effect of Peer-led team teaching on academic performance of pupils in numeracy in Moro Local Government Area, Kwara state, there was no significant effect of gender on academic performance of pupils in numeracy in Moro Local Government Area, Kwara state and there was no significant effect of school-type on academic performance of pupils in numeracy in Moro Local Government Area, Kwara state. Therefore, the study concluded that, Peer-led team teaching can bring about improvement in the academic performance of pupils in Numeracy regardless of gender and the type of school they attend. Thus, the following recommendations among others were given: Numeracy teachers should be enlightened on the effectiveness of Peer-led team teaching on pupils' academic performance in Numeracy and Curriculum developer in Numeracy should incorporate Peer-led team teaching into the numeracy curriculum as one of the innovative strategies that would be used to teach Numeracy especially in primary schools.*

Keywords: Peer-led; Teaching; Numeracy; Academic Performance; Pupils

Introduction

Numeracy is the ability to think rationally with the application of simple numerical concepts. Understanding basic arithmetic operations like addition, subtraction, multiplication, and division are included in the basic numeracy skills. For example, if one can comprehend simple Mathematical equations such as $1 + 1 = 2$, then one would be deemed to be possessing at least basic numeric understanding. Significant components of numeracy also include computation, measurement, probability, and statistics as well as number sense and operation sense. A person who is numerate can deal with and respond quantitatively to life's demands. (Brooks, 2010).

The majority of pupils' poor academic performance in numeracy is frequently attributed to teachers' inefficient teaching strategies, misconceptions about how difficult is numeracy to learn, fear and anxiety (Brooks, 2010). Aunio (2016) blamed dyscalculia, interrupted lessons, and parents' attitudes for their children's low performance in numeracy. Quitadamo, Brolerer and Croach (2009), pointed out that lack of meaningful library and laboratory, qualified teachers, home environmental factors and family backgrounds in addition to the little participation of parents in the education of their children as the primary factors for low numeracy performance.

Regardless of numeracy importance, numeracy has been affected from apparent deficiencies in teaching instruction and learning instruction as the pupils' attitude towards numeracy remain a great challenge for the educators. In the recent year, according to Chief Examiner of West African Examination Council (2017) reported that 2017 is better than 2016 yet not encouraging at all. As a matter of fact, numeracy requires a planned learning instruction that would allow pupils' active participation in numeracy classroom such as peer-led team teaching in numeracy. Peer-led team teaching has been proven to be one form of cooperative learning that allows pupils more time to reflect on their responses and help them learn higher level thinking skills from their classmates. Peer-led team teaching is the effort on the part of a school or class teacher to group pupils based on their characteristics, interest needs, and flexible instructional practices, in organizing the learning environment.

Nigeria and the world are talking about sustainable development, in which STEM (science, technology, engineering, and numeracy) cannot be set aside nor separated from the plans to achieve the needed sustainable development. Sustainable development, according to Nwafor (2012), is a procedure in which beneficiaries actively decide what they need and how to supply them. People must be given the required lifelong skills, like communication, collaboration or teamwork, tolerance, and decision-making skills, in order for them to participate in meaningful ways, thinking, leadership, and utilization skills (Nwafor, 2012). Some of the enumerated skills are used in the process of learning the entire body of knowledge in numeracy. It is, therefore necessary to discover a technique to teach numeracy so that pupils are not only beneficiaries but also participants in choosing the direction of growth. Giving pupils the chance to take part in their own learning via suitable teaching techniques, such as peer-led team learning, is the only way to do this.

Peers essentially educate peers while obtaining a great learning experience through peer-led team teaching. The value of peer leading sessions to facilitate small group discussions on the current course topic is further emphasized by peer-led team teaching. It is hoped that by using peer-led team teaching, participants' conceptual comprehension will improve and be demonstrated in written assessments. Three components of peer-led team teaching—discussing, questioning, and applying—all take place cooperatively in small groups (Quitadamo, Brolerer & Croach; 2009). Attaining a good grasp of peer-led team teaching requires expanding on these three aspects. Many researchers have carried out studies on peer-led team teaching but to the researcher's knowledge there is no empirical study on peer-led team instruction in the researcher locale.

Colette (2004) investigated the effects of co-teaching science with primary school instructors on the interest and knowledge of the students. The undergraduate teachers-in-training for this project were assigned to teach in primary schools alongside primary instructors. Youngsters were shown to appreciate science sessions more and have fewer age disparities than other children after six months of instruction. Also, it enhances teachers' education as well as improves children's science knowledge. Akpan and Onunkwo (2019) studied the effect of incorporating web-assisted learning with Team Teaching in seventh-grade science classes. Two certified science teachers and four classes of the seventh graders participated in this study. The results showed that students using the unconventional instructional strategies received higher average final test scores than students using the conventional teaching method.

Akpan and Onunkwo (2019), demonstrated that pupils' performances differ by a significant amount taught arithmetic progression using peer led team learning than those taught using lecture methods. Pupils taught Arithmetic Progression using peer led team learning out performed those taught using lecture method with a mean of 55.90 and 45.02 respectively. The high performance of pupils in the peer-led team learning could be due to the pupils being actively involved in their learning and also being free to ask question where it is necessary without any fear. Also, peer-led team learning's (PLTL) effects on secondary school students' conceptual comprehension of biology in evolution were examined by Wells (2012). The researcher intended to use moderating variables of gender and school type which was not considered in the earlier investigations.

Gender, according to Musa (2016), is a psychological experience of being a male or a female that connects to cultural attributes of both males and females. Akpan and Onunkwo (2019), showed that there are no appreciable variations in the performance of male and female pupils taught arithmetic progression using peer led team learning. This could be due to cooperation by members of each group and competition between groups. Everyone always wants to have the best presentation when given the chance to lead the class. Also, Depaz and Moni (2008), who carried out a study on peer led team learning and pupils' academic performance in organic chemistry; it was revealed that there was no significant difference in the performance of male and female pupils who participated in the peer led team learning group. Okon (2010) revealed in a study that males tend to perform better in numeracy, while females tend to perform better in computation, and there is no significant gender difference in understanding numeracy concept. Another variable of importance to the study is school type.

Olosunde and Olaleye, (2010) maintained that private schools vary widely and the degree of parental participation differs from one private school to the other. Parents pay for the cost of educating their children in private schools and therefore tend to be more engaged in determining what the schools offer than parents whose children are in the public schools (Alimi & Alabi, 2012). Okon (2010) noted that children who attended private primary schools performed better than pupils in public schools. This viewpoint is further confirmed by Mburu (2013), who argued that public schools that valued education tended to defer to the general public and students' parents when deciding whether or not to pursue an education. Regardless of these efforts, the issue of pupils' poor academic performance in numeracy still persists. This creates a researchable gap in knowledge which this research intends to fill by examining the effect of peer-led team teaching on pupils' academic performance in Moro Local Government Area of Kwara State, Nigeria.

Statement of the Problem

All facets of human life are impacted by Numeracy to varying degrees. Society views numeracy as the cornerstone of technological and scientific knowledge, which is essential to a country's socioeconomic progress. Unfortunately, in the basic, secondary, and postsecondary educational levels in Nigeria, students' performance in this crucial topic throughout time has not been particularly encouraging. Many pupils today have developed a negative perception of numeracy as a difficult and uninteresting

subject especially in Arithmetic progression. The researcher, who is a numeracy teacher, reached this conclusion after speaking with other numeracy educators within region during various teaching practices. This made the investigator to consider if the teachers' chosen methods of instruction might be to blame for the pupils' subpar numeracy performance. Could peer-led team teaching help pupils' numeracy performance? To find satisfying answers to these questions, the researcher was motivated to conduct this study on the effect of peer led team learning on pupils' academic performance in Numeracy

Purpose of the Study

Specifically, the purposes are:

- a. examine the main effect of peer-led teaching on pupils' academic performance in Numeracy in Moro Local Government Area of Kwara State
- b. investigate the main effect of gender on pupils' academic performance in Numeracy in Moro Local Government Area of Kwara State.
- c. assess the main effect of school type on pupils' academic performance in Numeracy in Moro Local Government Area of Kwara State.

Hypotheses

The following research hypotheses were formulated

H₀₁: There is no significant main effect of treatment on pupils' academic performance in Numeracy in Moro Local Government Area of Kwara State.

H₀₂: There is no significant main effect of gender on pupils' academic performance in Numeracy in Moro Local Government Area of Kwara State.

H₀₃: There is no significant main effect of school type on pupils' academic performance in Numeracy in Moro Local Government Area of Kwara State.

Methodology

This study adopted the pretest-posttest, control group quasi-experimental research design. The population of this study consisted of all primary school pupils in both public and private schools in Moro Local Government Area of Kwara State. A factorial design of 2X2X2 was adopted to test the null hypotheses for this study. The first two levels were two experimental groups (peer-led team teaching and the control group). The second factorial level is based on gender that is male (M) and female (F), while the third factorial level is the school type (public and private). This design allowed for the experimental groups to receive treatment (peer-led team teaching) while the control groups received placebo, although the control group were taught the same topics as the experimental group using the conventional teaching method. However, both the experimental and control groups received the pre-test and the post-test before and after treatments, respectively.

The study's population were all primary three pupils in both 27 public primary schools with a total of 6,696 pupils and 241 private schools with total of 13,443 pupils in Moro Local Government Area, Kwara state, (Kwara State School Census Report, 2019/2020). Intact classes were used to avoid disruption of class.

Sample size comprised of 110 primary three pupils. Simple random sampling was employed to choose four schools from the total population in Moro Local Government Area, Kwara State. Thereafter, one primary three pupils of these schools were selected for the experimental groups in addition to one control group. This is due to the fact that they are matured enough to respond to the test questions, and it will encourage learners to learn from peers and express themselves before reaching upper classes. The instruments used were: Pupils' Numeracy Performance Test (PNPT), Instructional Guide for Peer-led team teaching (IGPI) and Instructional Guide for Conventional Method (IGCM). Instruments were subjected to face and content validity by one literacy teacher and three experts in Early Childhood and Primary Education. To ascertain the reliability of the three instruments, test re-test method was used. Thereafter, Pearson Product Moment Correlation (PPMC) coefficient was used to determine the reliability index ($r=0.81$). Frequency counts and percentage were used to analyze the respondents' demographic information, while the hypotheses were tested at 0.05 level of significance, using analysis of covariance (ANCOVA).

Results

Hypothesis One: There is no significant main effect of treatment on pupils' academic performance in Numeracy in Moro Local Government Area of Kwara State.

Table 1: summary of Analysis of Covariance (ANCOVA) showing the Main Effect of Treatment in Pupils Academic performance in Numeracy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7533.810 ^a	4	941.726	4.640	.000
Intercept	50750.511	1	50750.511	250.038	.000
Pretest	19.277	1*	19.277	.095	.759*
Main Effect					
Treatment	4722.139	1*	4722.139	23.265*	.000*
Gender	.994	1*	.994	.005*	.944*
Schooltype	564.670	1*	564.670	2.782*	.098*
Error	20500.053	105*	202.971		
Total	460225.000	110			
Corrected Total	28033.864	109			

a. R Squared = .794 (Adjusted R Squared = .763)

Table 1 shows the effect of treatment on pupils' academic performance in Numeracy in Kwara state. There was significant main effect of treatment on pupils' academic performance in Numeracy in Kwara state ($F_{(1; 105)} = 23.265$, $P < 0.05$). The hypothesis is therefore rejected since the significant value (.000) is less than 0.05. This implies that treatment had significant effect on pupils' academic performance in Numeracy in Kwara state.

Table 2: Summary of Bonferroni's Poc Hoc Pairwise Comparison of the scores within the two groups

Treatment	Mean Difference	Experimental	Control Group
Peer-led team teaching	75.027	*	
Conventional Method	57.396		*

Table 2 revealed that the significant main effect exposed by table 6 is as a result the significant difference between Peer-led team teaching and conventional method. Peer-led team teaching refers to experimental group, while conventional method is known as control group. This indicates that those exposed to Peer-led team teaching (75.03) performed significantly greater than those exposed to conventional method (57.40).

Hypothesis Two: There is no significant effect of gender on pupils' academic performance in Numeracy in Kwara State

Table 1 also revealed the effect of gender on pupils' academic performance in Numeracy in Kwara State. There was no significant effect of gender on pupils' academic performance in Numeracy in Kwara State ($F_{(1; 105)} = .005$; $P > 0.05$). The hypothesis is therefore not rejected in the light of the result since the significant value (.944) is greater than 0.05. This implies that gender had no significant effect on pupils' academic achievement in Numeracy in Kwara State.

Hypothesis Three: There is no significant effect of school type on pupils' academic performance in Numeracy in Kwara State.

Table 1 also revealed the effect of school type on pupils' academic performance in Numeracy in Kwara State. There was no significant effect of school type on pupils' academic performance in Numeracy in Kwara State ($F_{(1; 105)} = 2.782$; $P > 0.05$). The hypothesis is therefore not rejected since the significant value (.098) is greater than 0.05. This implies that school type had no significant effect on pupils' academic achievement in Numeracy in Kwara State.

Discussion of findings

The first findings of this study revealed that there was significant effect of peer-Led team teaching on pupils' s academic performance in Numeracy. This implies that, the use of peer-led team teaching improved pupils performance in Numeracy. This can be due to pupils' active involvement in the teaching - learning activities. This finding supports that of Akpan and Onunkwo (2019), who revealed that there is a significant difference in the performance of pupils taught arithmetic progression using peer led team learning than those taught using lecture methods.

Secondly, the finding showed that gender had no effect on pupils' academic performance in Numeracy. This indicates that, both male and female performance were improved. Although there were no little differences in the performance of male and female, but it did not one gender significantly affect the other gender. This finding is in tandem with Scafidi (2010) disclosed that, there was no significant difference in the performance of boys and girls on conversation tasks. The finding is not in line with Okon (2010) revealed in a study that males tend to perform better in numeracy, while females tend to perform better in computation, and there is no significant gender difference in understanding numeracy concept. Kiminyo (2005) mentioned that girls tended to perform better than boys in the conversation of weight.

Another findings revealed that there was no significant effect of school type on pupils' academic performance in Numeracy. This finding implies that irrespective of school types, pupils' performance improved in numeracy. This finding negates Okon (2010) who noted that children who attended private primary schools performed better than pupils in public schools.

Conclusion

Considering the study's findings, it is evident that peer-led team teaching has effect on the academic performance of pupils in Numeracy. Peer-led team teaching can bring about improvement in the academic performance of pupils in Numeracy regardless of gender and the type of school they attend.

Recommendations

Recommendations are provided in light of the findings:

1. Teachers of numeracy should be informed about the benefits of peer-led team teaching for pupils' academic success in numeracy.
2. Curriculum developer in Numeracy should incorporate Peer-led team teaching into the numeracy curriculum as one of the innovative strategies that would be employed to teach Numeracy especially in primary schools.
3. It is essential that tertiary institutions should be sensitized on their responsibility to train pre-service teachers via means of Peer-led team teaching in learning.
4. Regular organization of seminars and workshops is necessary to inform teachers in both public and private schools on new strategies of teaching and how to use Peer-led team teaching in the classroom

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