AJEMATES
African Journal of Educational Management, Teaching and Entrepreneurship Studies
VOL.17 (1), January-April, 2026; https://ajemates.org

EFFECT OF CLASS WIDE PEER TUTORING ON STUDENTS' ACADEMIC PERFORMANCE IN MATHEMATICS

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ABSTRACT

The study investigated the effects of Class Wide Peer Tutoring on students' academic performance in mathematics. Quasi-experimental design of non-equivalent pre-test and post-test group was adopted in this study. Population consists of 230 Junior Secondary Two JS 2 students from four (4) public Junior Secondary Schools. Sample of 67 JS 2 students who participated in the study was obtained from two randomly selected schools serving as the experimental group and control group. Instruments for data collection was a multiple-choice Mathematics Performance Test (MPT). The MPT was validated by expert in Mathematics Education. Reliability coefficient of 0.87 was obtained for MPT using split half method. Finding revealed t-value of 6.895 at p, 0.000 less than 0.05 indicates a significance improvement in performance of students as a result of the adoption of Class Wide Peer Tutoring. The study recommends the adoption of effective instructional strategy such as Class Wide Peer Tutoring in teaching mathematics also the learning needs of students in mathematics should be put into consideration when planning the curriculum.

Keywords: Class Wide Peer Tutoring, Performance and Mathematics.

Introduction

Mathematics competence is a major determinant for post-school requirement and career options for young Nigerian (Kurniawan *et al*. 2020). However, students' consistent poor performance in mathematics has been poor worry to educators and researchers alike (Buckley *et al*. 2016). Verbalization of mathematics and presenting of solutions to problems on the chalkboard results difficulties encountered in learning mathematics (Jameel & Ali 2016); poor attitude towards mathematics (Salingay & Tan 2018; Uwineza *et al*. 2018). Nsengimana *et al.* (2020) opined that poor teaching methods and persistence teacher-centred instruction leads to students' poor performance in mathematics. Hassen (2015) stated that most important reason for students' poor performance is the use of teacher-centred methods which turns most students into passive learners. The traditional methods have been criticized by researchers such as Carter (2016); Muema, *et al.*, (2018) for not catering students learning needs especially those with difficulties in understanding. Jameel and Ali (2016) stated that poor performance in mathematics experiences by most students could be attributed to the teacher constant

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use of lecture method in the class room Scherer, *et al.*, (2020) found that use of effective teaching methods would influence on students' performance in mathematics. Therefor arise the need for a more effective teaching strategy that would enhance students' performance in mathematics such strategy is the Class Wide Peer Tutoring: - Rink (2006) defined Class Wide Peer Tutoring as a reciprocal teaching method involving pairing students in the class room with the aim of assisting and providing feedback to one another. Ward and Lee (2005) stated that Class Wide Peer Tutoring is a collaborative teaching strategy that has significant effects on students' academic performance. Goldberger, *et al.*, (1982) found Class Wide Peer Tutoring appropriate for increasing students' competencies in learning. Class Wide Peer Tutoring is an effective teaching strategy for students with learning disabilities (Allsopp, 1997).

Class Wide Peer Tutoring has the possibility of increasing whole class students' academic performance (Maheady *et al.*, 2001). Successful implementation of Class Wide Peer Tutoring would meet students with diverse learning needs (Delquadri *et al.*,1986). Diversity of learning in the classroom would be address by Class Wide Peer Tutoring by offering wide range opportunities for students' engagement in learning (Greenwood & Delquadri, 1995). In view of the importance of Class Wide Peer Tutoring on students' academic performance the present determines the effect of Class Wide Peer Tutoring on students' academic performance in mathematics.

Research Questions

i. What is the difference in pre-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method?
ii. What is the difference in post-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method?

Hypotheses

$H_{01:}$ There is no significant difference in pre-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method.

$H_{02:}$ There is no significant difference in post-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method.

Literature Review

Class Wide Peer Tutoring was first developed by Joseph Delquadri and Charles Greenwood to improve instruction among students with disabilities (Greenwood, 1997; Delquadri et al. 1986). Class Wide Peer Tutoring brings about multitude of instructional benefits for students, such as greater engagement and positive social interactions among classmates (Bowman-Perrott, 2009). Class Wide Peer Tutoring involves students working together in small groups, a by-product of which is that non-classified students obtain the added benefit of learning to work with a more diverse population (McFarland, 1998). Peers

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tutoring yield successful results in a learning inclusive classroom (Mastropieri & Scruggs, 2001). Active students' engagement suggests Class Wide Peer Tutoring is a useful tool for educators to enhance students learning (Arreaga-Mayer, 1998).

Burks (2004) investigated effects of Class Wide Peer Tutoring on students with learning disabilities finding revealed Class Wide Peer Tutoring improves students' academic performance. Prihatno (2014) investigated about improving grade X students' reading skill the result shows that the implementation of peer tutoring improved students' reading skill. Students could generate their ideas related to news item text after being given more sessions to interact with greatly motivated new friends. Another study by Putra (2012) investigated reading skill of the tenth graders who were taught by using Class Wide Peer Tutoring finding revealed students reading skill was improved and they become more active and focus in learning. Veerkamp, *et al*., (2007) investigated effects of Class Wide Peer Tutoring on reading achievement of students by using novels as the curriculum finding revealed improved performance of students taught using the Class Wide Peer Tutoring compared to the teacher-led instruction.

Methods

Quasi-experimental design of non-equivalent pre-test and post-test group was adopted in this study to determine effect of Class Wide Peer Tutoring on students' academic performance in mathematics. Population consists of 230 Junior Secondary Two JS 2 students from four (4) public Junior Secondary Schools in Kazaure Local Government Area. Sample of 67 JS 2 students who participated was obtained from two randomly selected schools serving as experimental group and control group. Instruments for data collection was a multiple-choice Mathematics Performance Test (MPT). Validity of the instrument was ascertained by expert in mathematics education. Reliability coefficient of 0.87 was obtained for the MPT using split half method. Data were analysed using mean, standard deviation and independent sampled t-test at 0.05 significant level.

Results

Research Question One: What is the difference in pre-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method?

Table 1: Mean and Standard Deviation of pre-test Mean Performance Score of students

Group	N	Mean	Std. Deviation	Std. Error Mean
Experimental	37	39.6842	9.22589	2.11656
Control	30	37.6818	7.75448	1.65326

Table 1 gives pre-test mean performance score of students in experimental group as

39.68 with SD 9.22 while pre-test mean performance score of students in the control group was obtained as 37.68 and SD 7.75.

$H_{01:}$ There is no significant difference in pre-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using lecture methods.

Table 2: Independent Sampled t-test of pre-test Mean Performance Score of Students in Experimental and Control Group.

Group	T	df	Sig.	Mean Difference	Std. Error Difference
Experimental	.755	65	.455	2.00239	2.65126
Control					

Table 2 gives t- value of 0.75 not significance at 0.45 greater than 0.05 indicating there is no significance difference in pre-test mean performance scores of students taught mathematics using Class Wide Peer Tutoring and those taught using lecture methods prior to the treatment.

Research Question Two: What is the difference in post-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method?

Table 3: Post-test Mean Performance Score of Students in Experimental and Control Group.

Group	N	Mean	Std. Deviation	Std. Error Mean
Experimental	37	69.0000	10.06645	2.30940
Control	30	45.5909	11.46281	2.44388

Table 3 gives the post-test mean performance score of students in the experimental group as 69.0 with SD of 10.06 while the post-test mean performance score of students in the control group was obtained as 45.59 and SD 11.46. This indicates students taught mathematics using Class Wide Peer Tutoring perform better than those taught using the lecture method.

$H_{02:}$ There is no significant difference in post-test mean performance score of students taught mathematics using Class Wide Peer Tutoring and those taught using lecture methods.

Table 4: Independent Sampled t-test of post-test Performance Score of Students in Experimental and Control Group.

Group	t	df	Sig.	Mean Difference	Std. Error Difference
Experimental	6.895	65	.000	23.40909	3.39517
Control					3.36242

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Table 4 gives t- value of 6.895 significance at 0.000 less than 0.05 indicating there is a significance difference in the post-test mean performance scores of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method.

Discussion of Findings

There was a significance difference in the post-test mean performance scores of students taught mathematics using Class Wide Peer Tutoring and those taught using the lecture method this finding agrees with Goulburn (2017) who reported that Class Wide Peer Tutoring improves students' academic performance and critical thinking. Also, in line with the present finding was report of Jodi (2019) who found that Class Wide Peer Tutoring improves students reading skills.

Conclusion

Class Wide Peer Tutoring is considered an effective instructional strategy to improving students' academic performance in mathematics. Students taught using Class Wide Peer Tutoring perform better in mathematics, the strategy encourages collaborative learning and meets diverse needs of the students.

Recommendations

Based on the findings the study recommends: -

i). The adoption of effective instructional strategy such as the Class Wide Peer Tutoring in teaching mathematics.

ii). Learning needs of students in mathematics should be put into consideration when planning the curriculum.

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