

## **EFFECTS OF PEER MENTORING STRATEGY ON STUDENTS' PERFORMANCE IN MATHEMATICS AT SENIOR SECONDARY SCHOOLS IN LAGOS STATE, NIGERIA**

By

**Nasrudeen Ayinde Malik (Ph.D.), Busurat Ayotunde Agunbiade & Debo Sulaimon Arikewuyo**

*Bakre Disu Oshodi Memorial High School, Agege, Lagos State, Lagos State Education District I, Dairy Farm, Agege, Lagos State & Lagos State Education District III, Falomo Ikoyi, Lagos State*  
[maliknasrudeen@gmail.com](mailto:maliknasrudeen@gmail.com), [arikewuyod@gmail.com](mailto:arikewuyod@gmail.com)

### **Abstract**

*This study investigated the effects of peer mentoring strategy on students' performance in mathematics at senior secondary schools in Lagos State, Nigeria. A quasi-experimental design type was used for the study. The study took a whole term with 99 senior secondary II students drawn from two randomly selected co-educational schools in Education District I in Lagos State, Nigeria. The research instrument was Mathematics Performance Test (MPT) drawn from standardized WAEC past questions. The two hypotheses were analysed using t-test statistics from the data generated. The findings of the study revealed that there was a significant difference in the performance of students involved in peer mentoring strategy and the students involved using traditional strategy. The study further indicated that gender had no significant difference on the performance of the students involved in peer mentoring strategy. It was therefore recommended that schools and mathematics teachers should adopt strategy such as peer mentoring strategy to enhance students understanding of mathematics.*

**Key words:** Peer Mentoring Strategy, Mathematics Education

### **Introduction**

Mathematics is an essential tool for human endeavour in order to live a meaningful and calculated life. It is a subject that students must take with utmost care and work towards its understanding for future academic pursuit. No student excels without a sound mathematical foundation. Isaac-Oloniyo (2017) asserted that a sound background in mathematics is a prerequisite for science and technology courses in tertiary institutions and that students' achievement in mathematics in secondary schools usually have a significant effect on their performance in future studies. Federal Republic of Nigeria (FRN, 2013) opined that mathematics should be visualised as the vehicle to train a child to think, reason, analyze and articulate logically. Students train and learn better when giving the opportunities to express ideas and get feedback from their peers. Chaugule (2014) expressed that the feedback ought to be analytical, to be suggestive, and to come at a time when students are interested in it. Also, there must be time for students to reflect on the feedback they receive to make adjustments and try again due to rigorous practice of traditional method of teaching.

The usual conventional method of teaching Mathematics could no longer be sufficient to meet the demand of students understanding of Mathematics. Rabi, Jamilu and Mukhtar (2017) expressed that a variety of teaching strategies have been advocated for use in science and mathematics classroom, ranging from Teacher-centered approach to more Student-centered approach. However, in line with the implementation of student-centered approach to teaching of Mathematics, some schools introduced the use of Peer Mentoring Strategy (PMS) at senior secondary schools level to improve the students' understanding of mathematics.

Mentoring is a structured and trusting relationship that brings young people together with caring individuals who offer guidance, support and encouragement aimed at developing the

competence and character of the mentee. Dekker and Sheehan (2012) explained mentoring as a relationship over a prolonged period of time between two or more people where the mentor provides constant, as needed support, guidance and concrete help to the protégé as they travel through life. It was further expressed that mentoring can expose youth to new information which may help them make better decisions about their current or future lives.

Langhout, Rhodes and Osborne (2004) examined different degrees of support, structure, and activities in mentoring relationships and identified four different mentoring styles in a traditional youth mentoring setting. Moderate mentors were conditionally supportive and showed moderate levels of activities and structure. Unconditionally supportive mentors were characterized by the highest levels of support. Active mentors offered the highest number of activities, but very little structure. Low-key mentors provided the lowest level of activities, but still high support. Going by the outcomes of the different mentoring styles, Langhout et al. (2004) found that mentees generally benefited most from moderate mentoring relationships with a conditional amount of support and a moderate level of activities.

### **Types of Mentoring**

The following types of mentoring have been identified. Traditional, group, team, electronic (e-mentoring), and peer mentoring. For the purpose of this study peer mentoring is the focus. Peer mentoring is a caring youth mentoring other youths that are close in age, and it often takes place in a school setting with the focus of building a relationship and academic sharing. Dekker and Sheehan (2012) explained that peer mentoring provides a structure to connect caring youth, who take the role of mentor, with other youth, and that most peer mentoring programmes are school-based. It was further explained that youth mentors are positive role models who develop relationships with and mentor younger students. Mentoring Partnership (2017) opined that positive peer mentoring relationship can have profound effects on a mentee’s sense of self-worth. It was further expressed that due to similarity in age of peer mentors to their mentees, mentees might feel more comfortable sharing concerns and problems with their mentors. This increases mentees access to appropriate support and resources during time of learning. In the same vein, Dekker and Sheehan (2012) asserted that the goals of peer mentoring are often oriented towards positives social skills and relationship strategies supported through skill-building activities between mentors and mentees.

### **Benefits of Peer Mentoring Strategy**

Karcher (2007) highlighted the following benefits that can be derived from peer mentoring strategy by the mentors and mentees.

<b>For Mentors</b>	<b>For Mentees</b>
Improved reasoning skill	Increased academic achievement; greater self-efficacy
Better ability to relate to parents; improved communication skills	Improved social skills
Greater feeling of connection to school; increased self-esteem and empathy	Greater feeling of connection to school and peers
Improved conflict resolution skills; greater patience; improved organizational skills	Decreased behavioural problems; lower rate of engaging in risky behaviour
Increased “cultural capital” which helps mentors to understand their own challenges and experiences	Increased school attendance; greater rate of continuing education

However, peer mentors are expected to be model behaviour in order to promote learning and positive development in mentees; create learning experience by taking advantage of local resources to cultivate their mentees existing interests; focus on the positive

approach challenges from a place of optimism and possibility; and encourage their mentees to build self-esteem and self-confidence.

The outcomes of different mentoring styles have been noted to increase the students learning ability and achievement level. Langhout et al. (2004) found that mentees generally benefitted most from moderate mentoring relationships with a conditional amount of support and a moderate level of activities. Concerning the academic performance of mentees, Leidenfrost, Strassnig, Schabmann, Carbon and Spiel (2011) found that motivating master mentoring showed a positive influence on the success in a peer mentoring programme among those mentees who were characterized as poor academic performers at the beginning of the programme. Leidenfrost, Strassnig, Schutz, Carbon and Schabmann (2014) observed positive effects on academic performance of students who participated in the peer mentoring programme when we compare the number of courses passed by mentees to the number passed by non-mentees.

Studies on students gender differences using various strategies on teaching and learning of Mathematics continue to have controversial results. Ajai and Imoko (2015), Abakpa, Anyor and Amo (2016), Saddq, Salman and Adeniji (2017) showed that there was no significant difference between the achievement of male and female students. On the other hand, Onwuka, Onwuka and Iweka (2010), Shafi and Aralu (2010), Tsebo and Kurumeh (2014) reported that male students performed higher in Mathematics than their female counterpart.

### **Statement of the Problem**

The issue of concern is the increase in poor performance of students in mathematics at both internal and external examinations over the year. The students centered learning has been neglected, which manifested in the inability of the students to explain and interpret mathematical concepts, word problems, represent problems using diagrams or symbols etc. Based on this, mathematics teachers need to provide an alternative instructional/strategy methods which will hopefully assist the students' to perform well in mathematics. Therefore, this study intends to investigate the effect of peer mentoring strategy on students' performance in mathematics at senior secondary school.

### **Purpose of the Study**

The study sought to determine the effects of peer mentoring strategy on students' performance in Mathematics at senior secondary school level in Lagos State, Nigeria. Specifically, the study determined:

1. the difference in academic performance of students when exposed to peer mentoring strategy in Mathematics and those exposed to conventional strategy.
2. influence of gender on the performance of the students in Mathematics when exposed to peer mentoring strategy.

### **Research Questions**

Answers were sought to the following research questions:

1. Is there any difference in the academic performance of students exposed to peer mentoring strategy and those exposed to conventional strategy in Mathematics?
2. Is there gender difference in the students' performance when exposed to peer mentoring strategy in Mathematics?

### Research Hypotheses

The following hypotheses were formulated for the study:

HO<sub>1</sub>: There is no significant difference in the academic performance of students exposed to peer mentoring strategy in Mathematics and those students exposed to conventional strategy.

HO<sub>2</sub>: There is no significant difference in students' performance on gender basis when exposed to peer mentoring strategy in Mathematics.

### Methodology

The study is a quasi-experimental design type. The experimental group was exposed to peer mentoring strategy and the control group taught without being exposed to peer mentoring strategy. Two senior secondary schools were purposively selected as experimental and control groups respectively in Education District I of Lagos State. The samples for this study were students from the existing class (intact class). The quasi-experimental data were drawn from 45 students for the experiment of 20 males and 25 females exposed to peer mentoring strategy for eight weeks. Mathematics Performance Test (MPT) which consists of 50 objective questions was designed by the researchers. The questions were drawn from Lagos State Unified Examination past questions conducted by Lagos State Examinations Board. Therefore, those questions have already been validated by the Lagos State Examinations Board. Both the experimental and control groups were taught the same topics. The only difference was that the control groups were taught by the teacher using the conventional method, whereas the experimental groups were peers in group using the peer mentoring strategy. The treatment lasted for eight weeks after which test was given to both groups using MPT and their scores were collated by awarding two marks to any correct answer. T-test was used to test the hypotheses at 0.05 level of significance.

### Results

**Hypothesis One:** There is no significant difference in the performance of students involved in peer mentoring and those not involved.

**Table 1:** t-test Analysis of Experimental and Control Group Scores

Group	N	Mean	SD	t-test	df	P-Value	Remark
Peer Mentoring Group	45	57.44	10.047	2.980	88	0.004	S
Conventional Group	45	51.71	8.101				

#### S-Significant

Table 1 reveals that a p-value of 0.004 which is less than the significant value of 0.05, hence the null hypothesis is rejected. This implies that there is a significant difference in the performance of students involved in peer mentoring and those not involved.

**Hypothesis Two:** There is no significant difference in the performance of male and female students involved in peer mentoring programme.

**Table 2:** t-test Analysis of Scores of male and female students exposed to Peer Mentoring Programme.

Gender	N	Mean	Std. Dev.	t-test	df	Sig. (2-tailed)	Remark
Male	20	60.35	10.649	1.777	43	0.08	NS
Female	25	55.12	9.089				

#### NS-Not Significant

Table 2 shows that the p-value of 0.08 is greater than the significant value of 0.05, hence the null hypothesis is not rejected. This implies that there is no significant difference in the performance of male and female students involved in peer mentoring programme.

### Discussion

The result of this study revealed that there was significant difference between the mean performance scores of the students exposed to peer mentoring strategy and those exposed to conventional strategy of teaching. The difference was in favour of those exposed to peer mentoring strategy. This finding is in line with that of Udiutoma and Srinovita (2015) and Leidenfrost, Strassnig, Schutz, Carbon, and Schabmann (2014) who in a similar study reported that students that participated in peer mentoring performed better than their counterparts.

The findings of this study further revealed that there is no significant difference in the performance of the male and female students in mathematics when exposed to peer mentoring strategy. This corroborates with the study of Malik and Salman (2016), Saddiq, Salman, and Adeniji (2017).

### Conclusion

Exposing the students to peer mentoring strategy in the teaching of mathematics at secondary school level is capable of enhancing students' academic performance. It was also observed that the strategy is gender insensitive as no significant gender difference in the performance of the students in mathematics was seen.

### Recommendations

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

1. Training programme, seminars and workshops should be organised for mathematics teachers on how to introduce the use of peer mentoring strategy at secondary schools level.
2. The mathematics teachers should embrace the introduction of peer mentoring strategy among the students, since this study showed that the students perform better when exposed to it.
3. The school should create enabling environment for the use of the peer mentoring programme among the students.

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