
Effect of Collaborative Learning Strategy on Senior Secondary School Students' Anxiety and Achievement in Geometrical Construction in Abuja

¹Jekayinfa, Olatunji James Ph.D., ²Durojaiye, David Sunday & Oloda, Festus Smart S., Ph. D.

National Mathematical Centre, Abuja, Nigeria

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ABSTRACT: *The study researched on the effect of collaborative learning strategy (CLS) on senior secondary school students' anxiety and achievement in geometrical construction (GC) in Abuja. Three research question and three corresponding hypotheses were answered and tested respectively. It was a Quasi-experimental design of the pre-test, post-test, non-randomized and non-equivalent control group type involving one experimental and one control group. A total of 157 (71 males and 86 females) SSI students were involved in the study, 74 (33 males and 41 females) students for the experimental group and 83 (38 males and 45 females) students for the control group. 4-stage sampling technique involving stratified, simple random sampling and intact class techniques were used to arrive at the samples. Two research instruments, Mathematics Achievement Test (MAT) and Mathematics Anxiety Questionnaire (MAQ) were employed for data collection. Descriptive statistics and percentages were used to answer the research questions while the hypotheses were tested using Analysis of Covariance (ANCOVA) at the level of 0.05 level of significance. The findings of the study were that i. students taught GC using CLS had lower Anxiety Mean Score than those taught without the method, ii. students taught GC using CLS had higher Achievement Mean Score than those taught without the method iii. male students scored higher in the achievement test than their female counterparts when taught GC using CLS iv. there was significant difference between the Anxiety Mean Score of students taught GC using CLS and those taught without the method v. there was significant difference between the Achievement Mean Score of students taught GC using CLS and those taught without the method, and vi. there was significant difference between male and female students' Achievement Mean Scores when taught GC using CLS. The study recommended that all education stakeholders should endeavor to provide all necessary support to allow mathematics teachers make use of CLS in mathematics classrooms.*

KEYWORDS: collaborative learning strategy (CLS), anxiety, achievement & geometrical construction (GC)

INTRODUCTION

Mathematics is a core subject in both basic and post basic education in Nigeria. Mathematics is traced generally to the technological development of any nation. It is a science of order, logic and pattern. Because we live in a world of pattern where nothing is entirely new, anyone having very sound grasp of the knowledge of Mathematics may not find it difficult to fit in, since everything about Mathematics itself is pattern. It has been reported by several scholars in education that good knowledge of Mathematics will help students understand other subjects. Akinoso, Olafare, and Akinoso (2021) averred that any student who does not understand Mathematics well will end up struggling in other subjects and such students' career options are limited. Elaine (2013) while defining Mathematics as the science that deals with the logic of shape, quantity and arrangement further explained that Mathematics is everywhere around us and in everything we do every day; because it is the building block for everything in our daily lives, including mobile devices, architecture (ancient or modern), art, money, engineering and even sports. Anaduaka, Sunday and Olaoye (2018) submitted that mathematics is a logical way of thinking that aims at solving personal and social problems; and it has timely improved our communication, accommodation, production and recreational activities.

The concern of stake holders in the education industry is that in spite of the importance of Mathematics to the society, students are not performing satisfactorily well in both internal and external examinations. This can be attested to in table 1.

Table 1: Trends of Students' Performance in WASSCE Mathematics in Nigeria from 2016-2020

Year	Total Enrollment	No. of Candidates that sat for Exams	No. and % of (A1-C6)	No. and % of (D7-E8)	No. and % of F9
2016	1, 556,142	1,544,758	1,056,923 (68.42%)	303,545 (19.65%)	184,290 (11.93%)
2017	1,567,016	1, 559, 162	1,115,736 (71.56%)	175,718 (11.27%)	267,708 (17.17%)
2018	1,620,762	1,559,416 (96.21%)	923,486 (59.22%)	323,313 (20.73%)	312,617 (20.05%)
2019	1,628,834	1,590,089 (97.62%)	1,020,519 (64.18%)	240,959 (15.15%)	328,611 (20.67%)
2020	1,629,381	1,538,424 (94.42%)	1,003,668 (65.24%)	318,763 (14.04%)	215,993 (20.72%)

Source: National Bureau of Statistics (2019) and Statistics Section, WAEC Office, Yaba, Lagos (May, 2020)

Table 1 revealed that 487,835 (31.58%), 443,426 (28.44%), 635,930 (40.78%), 569,570 (35.82) and 534,756 (34.76%) could not pass Mathematics at credit level in 2016, 2017, 2018, 2019 and 2020 respectively. These numbers of non-credit performance are considered too high by the researchers and it calls for concern. Researchers such as Obioma (2011), Ojimba (2012) and Durojaiye, Oloda and Jekayinfa (2021), affirmed that poor teaching approaches, adherence to old and ineffective methods of teaching, lack of proper grasp of the subject matter by Mathematics teachers, negative attitude of students towards Mathematics and students anxiety towards the subject are factors affecting the achievement of students in Mathematics among others. Negative feelings towards learning of Mathematics begin as a result of a number of encounters relating to the way Mathematics teachers present or teach the subject to the students (Green & Allerton, 1999).

Because of the importance placed on Mathematics, the National Policy on Education (NPE, 2013), apart from making Mathematics a core subject in both primary and Secondary schools also demands that in order to fully achieve the goals of education in Nigeria and gain from its contribution to the national economy, government shall take necessary measures to ensure that teaching shall be practical, activity-based, experimental, socially interactive and Information Technology (IT) supported. One of the social interactive strategies of teaching Mathematics today which may also significantly enhance achievement, increase students' interest and reduce anxiety of young learners is the Collaborative Learning Strategy.

Collaborative learning (CL) is described by Roselli (2016), as 'a construct that identifies a current strong field, both in face-to-face and virtual education'. CL is an educational strategy to learning that brings together groups of learners in the same level of education (class) to solve a problem, finish a task, or craft and an invention (Laal & Laal, 2011). In the CL milieu, the learners are challenged both socially and emotionally as they listen to different perspectives, and are required to articulate and defend their ideas. In so doing, the learners begin to create their own unique conceptual frameworks and not rely solely on an expert's or a text's framework. In a CL setting, learners have the opportunity to converse with peers, present and defend ideas, exchange diverse beliefs, question other conceptual frameworks, and are actively engaged (Laal, Laal & Kermanshahi, 2012). CL represents a considerable departure from the typical teacher-centered or lecture-centered situation in school classrooms. Although, in collaborative classrooms, the lecturing, 'talk and chalk', listening, note-taking process may not vanish completely, but it is combine together with other processes that are based in students' discussion and active work. A Teacher who uses the CL teaching strategy thinks little about himself or herself as an expert transmitter of knowledge to students but sets the stage for the students to interact among themselves in small groups.

There is a thin line of distinction between collaborative and cooperative teaching strategies. While collaboration involves participants in the group working together on the same project, task or assignment, instead of being parallel on separate divisions of the project or task, cooperative

learning, on the other hand, is characteristically carried out through the division of labour, with every member of the group responsible for some sections of the problem solving (Dillenbourg, Backer, Blaye, & O'Malley, 1996).

Mathematics anxiety is another factor that could limit the achievement of students in Mathematics. According to Jekayinfa (2019), Anxiety is a state of fear and apprehension towards an event. Mathematics teaching and learning are critical events in the classroom situation. Oyekan, OlalekanSulaimon, and Lucky (2018; p30) also described Mathematics anxiety as 'the state of the mind developed through personal experience, and individual emotional responses to these experiences'. No appreciable achievement can be made by students who have fear and negative feeling for Mathematics. The attitude of such students toward the learning of Mathematics would be poor. The poor attitude will affect their interest in the subject. Jekayinfa further submitted that the source of Mathematics anxiety in students may be due to poor instructional methods and the quality of Mathematics teaching at the elementary school level. Mathematics anxiety in children may develop from children's homes before they come to school, likely from the wrong perception inherited from parents or neighbours who have anxiety towards Mathematics themselves (Paeinkerton, 2005). Some students may develop anxiety from from their peers in school or from their senior simblings who also suffer from Mathematics anxiety and phobial. Teachers must reduce students' anxiety level in Mathematics through frequent testing, assignments, projects, learning by doing, students' active participation through collaborative learning in Mathematics lessons, students-centered learning, adequate teaching/learning methods and aids and test-taking strategies (Nonyelu & Anikweze, 2013).

Statement of the Problem

Mathematics to the society is as important as blood is to human body. The society cannot survive without the knowledge and application of the knowledge of Mathematics. Unfortunately, the desired level of students' achievement in this important subject at the secondary school level has not been attained owing to several reasons. Table 1 indicates some improvements in the performance of students in the West African Senior School Certificate Examination's results in recent years. However, the same result shows that 31.58%, 28.44%, 40.78%, 35.82% and 34.76% could not pass Mathematics at credit level in 2016, 2017, 2018, 2019 and 2020 respectively. One must be worried for this number of students who could not proceed to the university or be admitted to study their desired courses because of Mathematics. Reasons, such as poor teaching methods and strategies by Mathematics teachers, bad attitude of students to the learning of Mathematics, lack of interest, Mathematics phobia and anxiety among others are adduced by researchers as causes of the unsatisfactory and unstable performance and achievement of students in Mathematics.

In a bid to help solve this problem, a lot of studies have been carried out by researchers of mathematics education on a range of teaching and learning strategies. Among the teaching

strategies that have been thoroughly researched upon is the Collaborative Learning Strategy (CLS). However, not much research on the effect of Collaborative Learning Strategy on students' anxiety and achievement in the Federal Capital Territory (FCT) and specifically on Geometrical Construction as a subject under Mathematics has been carried out. Most of the studies cited by the researchers were on Mathematics generally. Very few were centered on particular topics in Mathematics. Hence, the need for the present study in FCT.

Purpose of the Study

The main purpose of this study was to find out the effect of Collaborative Learning Strategy on Senior Secondary School students' anxiety and achievement in Geometrical Construction (GC) in the Federal Capital Territory. Specifically, the study determined:

- i. difference in the mean anxiety scores of students taught GC using Collaborative Learning Strategy (CLS) and those taught with conventional method;
- ii. difference in the mean achievement scores of students taught GC using CLS and those taught with conventional method; and
- iii. difference that exists in the mean achievement scores of male and female students taught GC using CLS.

Research Questions

The following research questions were raised to guide the study:

1. What is the difference in the mean anxiety scores of students taught GC using CLS and those taught with conventional method?
2. What is the difference in the mean achievement scores of students taught GC using CLS and those taught with conventional method?
3. What difference exists in the mean achievement scores of male and female students taught GC using CLS?

Hypotheses

The following hypotheses were formulated and will be tested at 0.05 level of confidence:

H0₁: There is no significant difference in the mean anxiety scores of students taught GC using CLS and those taught with conventional method.

H0₂: There is no significant difference in the mean achievement scores of students taught GC using CLS and those taught with conventional method.

H0₃: There is no significant difference in the mean achievement scores of male and female students taught GC using CLS.

METHODOLOGY

This study employed a quasi-experimental design of the pre-test, post-test, non-randomized and non-equivalent control group type. Two groups were involved: one experimental group and one

control group. The experimental group was exposed to Collaborative Learning Strategy (CLS) and the control group was taught with conventional method. Both groups were subjected to pre-test and post-test. The independent variable was the use of CLS to teach GC and also served as treatment for the experimental group while the conventional method will be used to teach the control group. The dependent variable was the students' achievement in pre-test and post-test.

The target population for this study consisted of all Senior Secondary one (SS1) students in FCT, Abuja, Nigeria. The choice of SS1 students was appropriate for this study because it is at this level that GC is taught in Nigerian schools. Multi-stage sampling technique was adopted to select the sample for this study. First, FCT was stratified along the six (6) area councils and Kuje Area Council was selected using the lucky-dip technique. Next was to randomly select two (2) schools using the simple random system technique from the eleven (11) public Senior Secondary Schools in Kuje Area Council. The two schools which had equivalent mean scores were further randomly assigned to experimental and control groups. Intact classes of the selected schools were used for the study.

A total of 157 (71 males and 86 females) SS1 students were involved in the study. The selected sample has 74 (33 males and 41 females) students for the experimental group and 83 (38 males and 45 females) students for the control group. The subjects of each of the two research groups were further randomly grouped into collaborative groups. Each study group contained five collaborators (subjects/students). In all, the experimental group contained 15 collaborative groups labeled from group 1 to group 15 while the control group contained 16 of such groups labeled from group 1 to group 16. To assign subjects of the experimental group into collaborative groups, the researchers cut pieces of papers where group numbers from group 1 to group 15 were written on each piece of paper and wrapped. Students from the experimental group were requested to select only one paper and then open. The subject belongs to the group found on his/her piece of paper. The same process was also carried out in the control group except that there were 16 collaborative groups here.

Two research instruments, Mathematics Achievement Test (MAT) and Mathematics Anxiety Questionnaire (MAQ) were employed for data collection. The validity of the instrument was ensured by giving two experts in Mathematics education for the face, construct, and content validity. For the reliability of the instruments, the researcher administered the instruments in another school in another Area Council in the FCT that was not participating in the main study using the test re-test method. The Pearson Product Moment Correlation Coefficient was employed to analyze the scores obtained and reliability coefficients for MAT and MAQ were calculated to be 0.82 and 0.79 respectively which showed that the instruments were reliable enough for use. The study lasted for a period of five weeks.

Descriptive statistics and percentages were used to answer the research questions while the hypotheses were tested using Analysis of Covariance (ANCOVA) at the level of 0.05 level of significance using Statistical Package for Social Science (SPSS) 21.0.

Demographic Information

Frequency counts and percentages were used to describe the personal characteristics of the respondents. Table 2 shows that out of 157 students that participated in the study 71 (45.2%) were males and 86 (54.8%) were females. This implies that the male participants were more than their female counterparts.

Table 2: *Gender Distribution of the Respondents*

Gender	Frequency	Percentage (%)
Male	71	45.2
Female	86	54.8
Total	157	100.0

Table 3 shows that 74 (47.1%) of the subjects were in Experimental group and 83 (52.9%) were in Control group based on the intact class selected for each group

Table 3: *Distribution of the Respondents Based on Group*

Group	Frequency	Percentage (%)
Experimental	74	47.1
Control	83	52.9
Total	157	100.0

RESULTS

Research Question 1: What is the difference in the mean anxiety scores of students taught GC using CLS and those taught with conventional method?

Table 4 shows that students taught GC using CLS had a lower anxiety mean score of 32.6 than students taught GC with the normal conventional method who had a higher anxiety mean score of 52.3 which indicated a difference of 19.7 in the anxiety mean scores between the two groups.

Table 4: *Anxiety Mean Scores of the two Groups*

Group	Mean	Std. Deviation	Mean Difference
Experimental	32.6	7.20	19.2
Control	52.3	14.80	

Research Question 2: What is the difference in the mean achievement scores of students taught GC using CLS and those taught with conventional method?

Table 5 shows that students taught GC using CLS had a higher achievement mean score of 59.6 than students taught GC with the normal conventional method who had a lower achievement mean score of 47.4 which indicated a difference of 12.2 in the achievement mean scores between the two groups.

Table 5: *Achievement Mean Scores of the Two Groups*

Group	Mean	Std. Deviation	Mean Difference
Experimental	59.6	16.52	12.2
Control	47.4	10.56	

Research Question 3: What difference exists in the mean achievement scores of male and female students taught GC using CLS?

Table 6 shows that male students had a higher achievement mean scores of 61.2 than their female counterparts that had achievement mean score of 51.8 when taught GC using CLS. This shows a difference of 9.4 in their mean scores.

Table 6: *Achievement Mean Scores of the Two Groups*

Group	Mean	Std. Deviation	Mean Difference
Male	61.2	16.52	9.4
Female	52.8	20.06	

H0₁: There is no significant difference in the mean anxiety scores of students taught GC using CLS and those taught with conventional method.

ANCOVA was used to analyze respondents' scores to determine whether there was a significant difference in the anxiety mean scores of students in the two group. Table 7 shows df (1, 157) and

F value of 38.418 which was significant at 0.05 alpha level. Hypothesis 1 was therefore rejected since P value 0.000 is less than 0.05 alpha level ($0.000 < 0.05$). This implies that there was a significant difference in the anxiety mean scores of students taught GC using CLS and those taught without CLS

Table 7: Analysis of Covariance of Anxiety Mean Scores of Students in the Two Groups

Source	Type III Sum of Squares	SumDf	Mean Square	F	Sig.	Partial Squared	CLS
Corrected Model	8543.019 ^a	4	2450.755	17.634	.000	.275	
Intercept	54120.060	1	54670.060	393.372	.000	.754	
Pre_Test	686.212	1	686.212	4.938	.028	.037	
Group	6424.215	1	5724.215	38.418	.000	.243	
Gender	227.758	1	227.758	1.639	.203	.013	
Group * Gender	1.629	1	1.629	.012	.914	.000	
Error	17789.165	128	138.978				
Total	344870.500	133					
Corrected Total	27592.184	132					

a. R Squared = 0.275 (Adjusted R Squared = 0.225)

H0₂: There is no significant difference in the mean achievement scores of students taught GC using CLS and those taught with conventional method.

To determine whether significant difference existed between the achievement mean scores of the two groups, ANCOVA was used to analyze the scores obtained from the two groups. Table 8 shows df (1, 157) and F value of 18.475 which is significant at 0.05 alpha level. Hypothesis 2 was therefore rejected since P value 0.000 was less than 0.05 alpha level ($0.000 < 0.05$). This implies that there was a significant difference in the achievement mean scores of students taught GC using CLS and those taught without CLS

Table 8: Analysis of Covariance of Achievement Mean Scores of Students in the Two Groups

Source	Type III Sum of Squares	SumDf	Mean Square	F	Sig.	Partial Squared	CLS
Corrected Model	8680.463 ^a	4	2170.116	9.937	.000	.268	
Intercept	33860.810	1	33860.810	155.055	.000	.548	
Pre_Test	633.635	1	633.635	2.902	.091	.022	
Group	3696.618	1	3696.618	18.475	.000	.117	
Gender	170.632	1	170.632	.781	.378	.006	
Group * Gender	449.171	1	449.171	2.057	.154	.016	
Error	27952.559	128	218.379				
Total	361972.000	133					
Corrected Total	36633.023	132					

a. R Squared = .237 (Adjusted R Squared = .213)

H0₃: There is no significant difference in the mean achievement scores of male and female students taught GC using CLS.

t-test was used to determine the difference between the achievement mean scores of male and female students. Result from table 9 shows that *t* value yielded 0.252 which is significant with P value $0.322 < 0.05$. This shows a significant result. Hence, the null hypothesis is rejected. This means that there is significant difference in the achievement mean scores of male and female students when taught Mensuration using CLS ($t_{(74)} = 0.322$; $P < 0.05$).

Table 9: Mean, Standard Deviation and *t*-Test Analysis of the Achievement Mean Scores of Male and Female Students Taught Mensuration using CVI

Variables	N	Mean	SD	t	df	Sig (2 tailed)	Decision
Male	33	61.2	18.1	.252	72	.322	Rejected
Female	41	52.8	18.2				

P<0.05

SUMMARY OF MAJOR FINDINGS

The major findings of this study are summarized thus:

1. Students taught GC using CLS had lower Anxiety Mean Score than those taught without the method
2. Students taught GC using CLS had higher Achievement Mean Score than those taught without the method
3. Male students scored higher in the achievement test than their female counterparts when taught GC using CLS
4. There was significant difference between the Anxiety Mean Score of students taught GC using CLS and those taught without the method
5. There was significant difference between the Achievement Mean Score of students taught GC using CLS and those taught without the method, and
6. There is significant difference between male and female students' Achievement Mean Scores when taught GC using CLS.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The findings of this study revealed that CLS is a good learning strategy that can be made use of to teach mathematics topics in schools. It was found out that students exposed to CLS have lower anxiety and higher achievement in GC. The implication of this is that students when exposed to the teaching strategy are likely to achieve better and have low anxiety towards Mathematics. This may be due to the fact that students in the experimental group were made to work

collaboratively thereby allowing the weak and Mathematics anxious students to be helped by better students in the group. This is in agreement with the findings of Jekayinfa (2021), and Jekayinfa and Owonuwa (2022) which reported a higher Achievement Mean Score of students exposed to Computer Video Instruction (CVI) and a lower Anxiety Mean Score of students exposed to Special Video Instruction respectively.

Considering gender, this study revealed that male students had a higher Achievement Mean Score than their female counter when exposed to CLS. This implies that male students may benefit more than their female counterparts when exposed to the strategy. This is in agreement also with the findings of Tabassum (2004), Abadi (2004), Ifeanacho (2012) and Valencia (2016) who reported differences in the Achievement Mean Scores of male and female students when exposed to special interventions in Mathematics classroom. However, the findings negate the findings of Jekayinfa (2021), and Jekayinfa and Owonuwa (2022) which reported that Male and female students had similar Achievement Mean Score when exposed to other special teaching strategies in Mathematics classroom.

The study concludes that Collaborative Learning Strategy (CLS) is a potent strategy for teaching and learning of topics in Mathematics. It is however recommended that School Authorities, Government and all Stakeholders put up policies that adequately provide avenues, opportunities, necessary materials and resources that would allow Mathematics Teachers adopt the strategy.

REFERENCE

- Abadi, L. (2004). *Relationship between demographic variables and mathematics anxiety in high school students in Tehran*. Masters Thesis, Tehran Teachers Training University, Department of Psychology and Educational Sciences.
- Akinoso, S. O., Olafare, F. O., & Akoinoso, Z. B. (2021). Effect of collaborative teaching approach on secondary school students achievement in attitude towards mathematics. *International Journal of Research and Innovation in Applied Science (IJRIAS)*, 6 (8), 1-5.
- Anaduaka, U. S., Sunday, A. O., & Olaoye, A. E. (2018). Effect of think-pair-share cooperative strategy of attention deficit hyperactive students. *Abacus, Journal of Mathematical Association of Nigeria*, 43 (1), 41-52.
- Dillenbourg, P., Backer, M., Blaye, E., & O'Malley, C. (1996). The evolution of research on collaborative learning. In E. Spada, & P. Reiman, *Learning in Humans and Machine: Towards an Interdisciplinary Learning Science* (pp. 189-211). Oxford: Elsevier.
- Durojaiye, D. S., Oloda, F. S., & Jekayinfa, O. J. (2021). Effect of activity-based instruction on senior secondary school students' retention in circle geometry in Abuja, Nigeria .

- Elaine, J. H. (2013). <http://mlivescience.com/38936-mathematics.hnt>. Retrieved from What is Mathematics?
- FRN. (2013). *National policy on Education. Lagos*. Lagos: HEPN Publishers.
- Green, S. & Allerton, M. (1999). Mathematical anxiety amongst primary QTS students. In L. Bills (Ed.), *Proceedings of the British Society for Research into Learning Mathematics* (pp. 43-47). Lancaster: St. Martin's College. Retrieved from: <http://www.bsrlm.org.uk/IPs/ip19-2/BSRLM-IP-19-2-8.pdf>
- Ifeanacho, A. O. (2012). *Effect of the Kumon teaching strategy on junior secondary school students' achievement, interest and retention in statistics*. University of Nigeria, Nsukka.
- Jekayinfa, O. J. (2021). Effects of computer video instruction and senior school students achievement in mensuration in Gwagwalada, Nigeria. *International Journal of Technology, Research and Management, 5(10)*
- Jekayinfa, O. J. (2022). Special video instruction and senior school students' anxiety towards mensuration in Gwagwalada, Nigeria. *European Journal of Education Studies, 9(10)*.
- Laal, M., & Laal, M. (2011). Collaborative learning: What is it? *Procedia-Social and Behavioural Sciences, 31* (2012), 491-495.
- Laal, M., Laal, M., & Kermanshahi, Z. K. (2012). Collaborative learning: What is it? *Procedia-Social and Behavioural Sciences, doi:10.1016/j.sbspro.2011.12.092*, 32 (1), 491-495.
- Nonyelu, R. N., & Anikweze, C. M. (2013). Assessment of the anxiety levels of mathematics students in Federal Capital Territory (FCT) Junior Secondary Schools. *ABACUS-The Journal of the Mathematical Association of Nigeria, 37* (1), 73-83.
- Obioma, U. A. (2011). Re-branding the strategies for teaching mathematics: the case of scaffolding in Sadiku, Fajemidagba and Adeniyi (Eds) *Proceedings of Annual Conference of Mathematical Association of Nigeria (MAN). Proceedings of Annual Conference of Mathematical Association of Nigeria (MAN)*. Ilorin: Olak Press.
- Ojimba, D. P. (2012). Mathematics education for sustainable development: Implication for scientific and technology literacy. *Journal of Education and Social Research, 3* (15), 22-30.
- Oyenekan, D.F., Olalekan, F., Sulaimon, M.O., & Lucky, A. (2018). The effect of mathematics anxiety on academic performance of Moshood Abiola Polytechnic students. *World Wide Journal of Multi disciplinary Research and Development, 4*(11), 28-38.
- Paekinkerton, S. P. (2005). *Attention Deficits and Hyperactivity in Children*. ASGE Publications.
- Roselli, N. (2016). Collaborative learning: Theoretical foundations and applicable strategies to university. *Propósitos Representaciones, 4*(1), 219-280. doi:<http://dx.doi.org/10.20511/pyr2016.v4n1.90>.
- Tabassum, R. (2004). *Effect of computer assisted instruction on secondary school students' achievement in science*. University of Arid Agriculture, Rawalpindi.
- Valencia, B. (2016). *Impact of computer assisted instruction on achievement of seventh grade mathematics*. Monterey Bay: California State University.