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Study Habit and Mathematics Anxiety of Secondary School Students in Ogun West Senatorial District, Nigeria

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Abstract
Mathematics is a core subject in Nigeria and most countries of the world. However, one of the attributed causes of poor performance in mathematics is mathematics anxiety. Hence, this study focused on the influence of study habit on the mathematics anxiety of senior secondary school students in Ogun West Senatorial District, Nigeria. The Mathematics Anxiety Rating Scale-revised (MARS-R) of Plake and Perker (1982) and the Study Habit Inventory of Bakare (1977) were used as instruments for the study. Data collected were statistically tested at 0.05 level of significance. Analysis of covariance (ANCOVA) and t-test were used to analyse data. Results revealed that although there was no significant difference in the effect of different categories of study habit (low moderate and high) on students' mathematics anxiety, a significant relationship exists between study habit and mathematics anxiety of students in Ogun West Senatorial District. The study also revealed that students with high study habit had more mathematics anxiety than those with medium and low study habits. In this regard, the Nigerian Educational Research and Development Council (NERDC) should include study habit techniques in the secondary school curriculum. Teachers and counselors should also be more proactive in guiding students to cultivate effective study habits so that their mathematical abilities can be enhanced

Keywords: Study habit; mathematics anxiety; secondary school students; teaching; counselling

Introduction

Over the years, mathematics anxiety has become a continuous problem and concern for researchers, educators and policymakers in Nigeria and one of its negative effect has been on student's poor academic performance. For instance, there has been a consistently low performance of students in mathematics in the West African

Examinations Council (WAEC) over the years. (Anyanwu, Emesi & Ezenwosu, 2024; Oguguo & Uboh, 2020; Adenipekun, 2019; Okoye, Okozie and Nlemadium, 2017; Orintunsin, 2010). The WAEC result reported in the study of Oguguo and Uboh (2020), revealed that only 35.15%, 35.9%, 25.7%, 35.99% and 35.10% of students in Nigeria had a credit pass in mathematics between 2016 and 2020 respectively. This development is not good for sustainability of the nation's educational system because mathematics is one of the major courses that require a credit pass before students gain admission into higher institutions and progress in their life pursuits. Van Mier, Schleepen and Van den Berg (2019) among others however, found anxiety in mathematics as one of the major associated factors of students' poor performance in mathematics. Akinsola, Tella and Tella (2007) also recognized that many students in Nigeria see mathematics as being difficult. Meanwhile, mathematics as a subject is one of the core and qualifying subjects for admission into tertiary institutions.

Mathematics anxiety is regarded as a negative attitude that learners have towards mathematics as a subject. (Aldrin, Estonanto & Ryan 2019). This definition implies that students are mathematically anxious when they are not favourably disposed to mathematics which makes them put up some attitudes of disinterest in the subject. Minara (2017) also regards mathematics anxiety as the fright, frustration, incapability and mental disorganisation that happens when people need to solve a mathematical problem. Often times and as pointed out by some scholars, some learners are in this state of helplessness while trying to solve mathematical tasks and if such are left alone, they may develop hatred for the subject which may eventually lead to poor performance. Similarly, Okoiye and Nlemadim (2017) define mathematics anxiety as a negative reaction to Mathematics associated with negative emotions. The effect mathematics anxiety has on students has made many researchers to study a range of moderating variables associated with it among which includes gender, study habit, grade level, geographical region, mathematics performance and the likes. (Yaratan & Kasapoglu, 2012; Hill, Carey & Szucs, 2018; Gunderson, Park, Maloney, Beilock & Levine 2018). Foley, Herts, Borgonovi, Guerriero, Levine, and Beilock (2017) also found that mathematics anxiety could be affected by a range of factors. However, few researchers have attributed poor study habit to mathematics anxiety. (Aldrin, Estonanto & Ryan 2019) This is why this study focused on

finding out the influence of study habit on the mathematics anxiety of senior secondary school students in Ogun West Senatorial District of Nigeria.

Study habit according to Arora (2016) refers to different individual behaviours in relation to studying. This means each individual is predisposed to a specific way of studying. Kamoru (2017) also defines study habit as a combination of study method and skill. This definition offers a progressive explanation to the earlier one as it includes the ability of the individual that is studying apart from the way the individual studies. This is why Jafari, Aghaei and Khatony (2020) concludes that study habits are behaviors and skills that are capable of increasing motivation and make studying an effective process that enhances learning. In other words, studying techniques of learners can be seen as an input while their academic success is the output that results from the input.

In the same vein, according to Mashayekhi, Faramarzpour, Mashayekhi, Rafati and Mashayekhi (2014), the time students spend on studying enhances their ability to retain learning materials and consequently increases their academic performances. This is why some studies have associated the academic performance of students to their study patterns. For instance, the study of Ebele and Olofu (2017) showed a significant relationship between study habits and students' academic performance. Singh (2010) also found a significant relationship between study habit and academic achievement in mathematics. However, in relating the effects of study habit on students' level of mathematics anxiety, few studies like that of Aldrin, Estonanto and Ryan (2019) have found that poor study habits in mathematics is a major cause of mathematics anxiety among senior high school students in Southern Luzon, Philippines.

Hassan (1983) related the causes of test anxiety to study habits and low achievement motivation among others. Also, the studies of Lawrence and that of Mohammed and Annand (2016) focused only on the influence of study habits on the mathematics anxiety of boys and girls without considering the effect of study habit on the mathematics anxiety of different levels of students' study habit (low, medium and high). According to them, these wrong opinions eventually make them have poor grades. Meanwhile, science-oriented subjects like mathematics are important for the scientific and technological development of any nation.

The need for this study is hinged on the fact that over the years, much research has not been carried out on study habits and mathematics anxiety hence there is a dearth of research on the degree of mathematics anxiety exhibited by students with low, moderate and high study habit. Meanwhile, the fact that students fear mathematics is real and needs urgent attention. Furthermore, the Government and other stakeholders seem not to pay much attention to factors that affect students' attitude, belief and consequently their academic performance. These explain why anxiety for subjects like mathematics is real and still exists among learners in the nation.

The problem of this study therefore emerged from the fact that many students fear and fail mathematics which is a very important school subject for entrance into higher institutions and upon which the social, economic, political, scientific and technological development of any nation depend on. Moreover, more studies have been concerned with the effect of study habits on test anxiety of students while few studies have focused on the effects of study habits on student's level of mathematics anxiety. Also, few studies (Lawrence, 2014) and Mohammed and Annand (2016) focused on the influence of study habits on the mathematics anxiety of boys and girls but did not consider the effect of study habits on the mathematics anxiety of different levels of students' study habit (low, medium and high). Study habit was therefore considered as a variable in this study because there is a dearth of research on the effect of study habit on mathematics anxiety. There is also a dearth of research on the mathematics anxiety level of students with low, medium and high study habit.

Aside this, recently, some researchers like Salva and Al Majali (2020) have found that each person is characterized by an optimal level of anxiety called positive anxiety which is a necessary condition for the development of personality as their study showed that 49% of high performing students have a medium level of anxiety and 41% are highly anxious and that a low level of anxiety leads to decrease in academic performance. Morosanova, Fomina, and Filippova (2020) also found that students who have an optimal level of anxiety find the strength and ability to control their emotional state and objectively assess situations. These contrary findings therefore need to be researched upon.

Ogun State was specifically chosen as the area of this present study because the researcher observed that not many secondary school leavers further their education after completing secondary school but

often go into petty trading. Moreover, the National Bureau Statics Report (2022) showed that between 2016 and 2020, the percentage of those who had five credit passes (including English and mathematics) in Ogun State were 52.8%, 54.1%, 51.69%, 35.6% and 36.78 respectively. This is a decline in performance and needs to be addressed urgently so that the consequences of having too many adolescents who are dropouts will not continue to have negative impacts on the economic, social and technological development of the nation.

Thus, recent findings on the positive impacts of anxiety on students' motivation and achievement, the lack of mathematics anxiety research done specifically on secondary school students in Ogun West Senatorial District as well as the serious implications that this can have on the ability of such students to gain admission into higher institutions has made the researcher to investigate the intersections between mathematics anxiety and the mathematics study habits of secondary school students in Ogun west senatorial district, Nigeria.

Purpose of the Study

Specifically, the objectives of this study were:

i. To examine the significant differences in mathematics anxiety of senior secondary students in Ogun State, Nigeria, based on their study habit categorization (low, moderate and high)
ii. To find out the significant influence of study habits on students' Mathematics anxiety.

Research Hypotheses

Based on the aims and objectives highlighted above, the null hypotheses generated for the study are as follows:

i. There is no significant difference in the mathematics anxiety of secondary school students in Ogun West Senatorial District based on their study habit categorization (low, moderate and high).
ii. There is no significant relationship between students' level of study habit and mathematics anxiety.

Literature Review

Several studies have associated study habit with text anxiety but there is not much literature on the influence of study habit on students'

level of mathematics anxiety. Below is among the few studies carried out on this area of concern.

Theories of Mathematics Anxiety

According to Caret et al (2016), most studies have concluded that there is a relationship between poor mathematics performance and mathematics anxiety. However, inability to conclude on the direction of the link (whether mathematics anxiety causes poor academic performance in mathematics or the other way around) has led to the development of many theories on mathematics anxiety (Devine et al., 2012). For instance, while the Deficit Theory suggests that poor performance in mathematics leads to higher anxiety; the Debilitating Anxiety Model suggests that mathematics anxiety hinders academic performance in mathematics by affecting the pre-processing, processing and retrieval of information (Wine, 1971; Tobias & Deutch, 1980; Tobias, 1986). Although the Deficit and Debilitating Anxiety theories have gained prominence over the years, recently, Processing efficiency theory and Attentional control theory (Passolunghi, Caviola, Agnostini, Perin, & Mammarella, 2016) have been used in the field of mathematics anxiety research. Other theories include the Reciprocal Theory by Jansen et al. (2013).and social cognitive theory (Dowker, 2005; Rameriz, Shaw & Maloney, 2018). This study however, focuses on the Deficit theory (Tobias, 1986).

The Deficit Theory of Mathematics Anxiety

The Deficit Theory postulates that low mathematical performance stems, in part, from students' poor academic preparation, including weak study habits and test-taking skills, which, in return, contribute to higher levels of mathematics anxiety (Tobias, 1985; Wittmaier, 1972). This theory implies that poor performance in a mathematics test would lead to higher anxiety and uncomfortable experiences in the future. According to Berch and Mazzocco (2007) and Carey et al (2016), this means that low score in mathematics would deficit the willingness or cause unwillingness to study mathematics and eventually lead to mathematics anxiety.

This theory gives explanation for the existence of negative correlation between mathematics anxiety and academic performance in mathematics. Some of the possible causes of the poor performance in the deficit theory were mathematical learning disabilities in early childhood (Passolunghi, 2011), self-regulation deficits when learning

mathematics (Jain & Dawson, 2009; Lee et al., 2014), and decrease in mathematics performance from one year to the next due to the students remembering their prior poor mathematics performance, particularly in male students (Ma & Xu, 2004). The study of Lyons and Beilock (2012) provided evidence that mathematics anxiety affects the cognitive functioning of students and thereby hinders their ability to learn mathematics. The Deficit theory of mathematics anxiety described above has been used to conceptualize factors influencing mathematics anxiety and how mathematics anxiety affects students' mathematics performance. However, although it has provided the basis for conceptualizing influences of mathematics anxiety, the complexities of pinning down the causes of mathematics anxiety to one factor will continue to lead to the development of further theories.

Students' Study Habit and Mathematics Anxiety

Rabia, Mubarak, Tallat, and Nasir, (2017), defines **s**tudy habit as when an individual dedicates a particular period to learning without being interrupted in any way. This means study habit is a personal devotion to studying without being forced to do so. Raani (2014) also defines study habit as a way by which learners locate materials to be learnt, outline, take notes and summarize those materials to enhance their understanding of the learning materials. In this regard, study habit can therefore be defined as the amount of studying that an individual spends in measures of time. According to Bakare (1977), study habit skills consist of homework and assignment; time allocation to work, reading and note-taking, study period, procedures, concentration; written work; examination and teacher consultation.

The study of Aldrin, Estonanto and Ryan (2019), found that high mathematics anxiety occurs when students realize that their inability to understand and analyse what they are studying would lead them to failure. The study also revealed that most of the participants who rated high on mathematics anxiety scores were the same set of students who had little or no interest at all in learning mathematics. However, although most previous studies have focused on the effect of study habits on test anxiety, there are still some disagreements on such influences. For instance, while the findings of Lawrence (2014) show that no significant difference in gender and study habits of secondary school students and the fact that girls had higher test anxiety than boys, the study of Mohammed and Annand (2016) showed a negative

relationship between study habits and test anxiety of Physical Education male and female students in India. Some studies like those of Baskar (2012), Gettinger and Seibert (2002), Zeidner (1998), Sweidel (1996), Britton and Tesser (1991) also found an inverse relationship between study habits and test anxiety.

In addition, the studies of Cates and Rhymer (2003) and Fannin-Carroll (2014) found that students' inadequate preparation in mathematics occurs due to a combination of high levels of mathematics anxiety and weak study skills. Hattie, Biggs, and Purdie (1996) also conducted a meta-analysis about the effects of learning skills and interventions on the learning of a mostly mixed-race student population and found a strong relationship between interventions that fostered strong study skills and student academic achievement. In the same vein, Brummer and Macceca (2008) found that strong study skills and positive attitudes toward mathematics have positive impact on students' mathematical performance and reduce their overall mathematics anxiety levels.

Furthermore, Okoiye, Okozie and Nlemadum (2017) found a direct impact of academic procrastination and study habits on expressed Mathematics anxiety of secondary school students in Edo State, Nigeria. Also, while Hills and Benlow (2008) found a correlation between study skill and anxiety, the study of Bakare (1977) found a negative relationship between test anxiety and study habit of 0.60 and -0.52 for male and female participants. The study of Yilmaz (2019) also found that math anxiety level of the students with math learning difficulties does not differ from the low achievers.

In the same vein, the study of Rodrigo (2020) on the impact of study habits and anxiety on mathematics achievement of senior high school students in Mati, Phillipines showed that students' study habit and mathematics anxiety do not significantly differ across their field of specialization and that mathematics achievement was significantly correlated to and influenced by the level of their study habits and mathematics anxiety. These studies show that possessing strong study skills, however, could potentially counteract the effects of mathematics anxiety on students.

However, some studies have refuted the finding that mathematics not often lead to poor academic performance in mathematics. For instance, the study of Devine et al. (2018) found that 77% of the highly mathematics anxious group had average or above

average mathematics performance. Likewise, the study of Musch and Broder (1999) found that both mathematics skill and test anxiety influenced academic performance in mathematics but study habits did not.

The study of Evren (2017) on a meta analysis to determine the effect size of anxiety on achievement however, found that anxiety has a negative and significant effect on achievement although the effect size was low. Thus, on the basis of this gap in literature, the inconclusive literature on the effects of anxiety on students' academic performance, the effects of study habit on mathematics anxiety and the dearth of research in this particular area forms the basis of justification for this study.

Methodology

Research Design

The researcher made use of a descriptive survey design to seek descriptive and self-reported information from senior secondary school students in Ogun West Senatorial District. A quantitative approach was used through descriptive statistics, as this approach and design are very effective in finding the effect of study habit on students' mathematics anxiety and the mathematics anxiety level of students with different study habits. (Mariene, 2012).

Sampling and Sampling Procedure

Simple random sampling method was used in picking the three secondary schools in Ogun West Senatorial District of Ogun State. After this, the researcher used a stratified random sampling technique to select 492 students from the three schools. The mathematics anxiety rating scale-revised (MARS-R) used as an instrument to measure students' level of mathematics anxiety was used to screen and select students with high mathematics anxiety. High mathematics anxious students (participants who scored 70% and above on the Mathematics Anxiety Rating Scale) were later stratified into three categories of high, moderate and low study habits based on their scores on the Study Habit Inventory used for the study. This was done by categorising students with high scores of 70% and above as having high study habits while those with study habit scores of 50-69% were categorised into the moderate study habit group and those who scored between 0 and 49% were categorised as having low study habit.

Further stratification based on gender was also made and only 180 high mathematics anxious students were randomly distributed into three groups of high, medium and low study habit based on gender. Stratified sampling technique was therefore used to select and distribute 60 SS2 students (30 boys and 30 girls) into high, moderate and low mathematics study habit as follows:

Table 1: High Mathematics anxious students based on levels of Study Habit and Gender

Levels of Study Habit	Gender	Total
High Study Habit	Male	30
	Female	30
Moderate Study Habit	Male	30
	Female	30
Low Study Habit	Male	30
	Female	30
Total		180

The inclusion criteria of the research were based on the fact that Participants were in senior secondary school 2 (which is next to the final class), they can read and write fluently and so were able to respond correctly to the questionnaire and were willing and ready to participate in the study without coercion.

Ogun West Senatorial District covers the Local Government areas of Ado-Odo/Ota, Egbado North, Egbado South, Imeko, Afon and Ipokia where the researcher has observed from experience that not many secondary school leavers further their education after completing secondary school but often go into petty trading. It is believed that this study will help to throw more light on this problem.

Instrument

Mathematics Anxiety Rating Scale - Revised (MARS-R) developed by Plake and Parker (1982) was used to measure students' level of mathematics anxiety. The scale measures mathematics anxiety through 24-item self-referencing statements that measures their level of anxiety. Participants rated the extent to which they agreed or disagreed with each statement on a five point Likert type scale ranging from 1 (no

anxiety) to 5 (high anxiety). It has demonstrated a coefficient alpha reliability of .98 with the full scale. (Plake and Parker, 1982). The researcher opted for MARS-R developed by Plake and Parker (1982) because they showed that the scale has sound psychometric properties and the scale has been used by scholars outside Nigeria such as Gierl and Bisanz (1995), Campbell and Evans (1997), Woodward (2004), Eden, Heine and Jacobs (2013), Pletzer, Wood, Scherndi, Kerschbaum and Nuerk (2016), Yusuf (2018) and Aldrin, Estonanto and Ryan (2019).

Study Habit Inventory was developed by Bakare (1977) to identify factors affecting the effectiveness of learning in the form of students' defective study habit. It is a self-report inventory which enables the student to describe the situations, habits, and conditions which affect its use of study time and subsequent performance on tests and examinations. The inventory consists of 45 items in form of direct questions to which the subjects were required to provide answers on a five point scale of how frequently they behaved in that way. The questions on the SHI were grouped into eight (8) sections as follows: homework and assignment, reading and note taking, study period procedures, concentration, written work, examinations and teacher consultation. Participants are rated on five point scale from 1 to 5. The test-retest reliability of the SHI is .83 while other studies by Bakare show a correlation between test anxiety and study habit for male and female to be 0.60 and -0.52 respectively. The researcher adopted the inventory for this study because of its psychometric characteristics and its usefulness in identifying the strength and weaknesses of students' study practices.

Data Analysis

The data collected through this study was statistically analysed to determine the significant difference in the level of mathematics anxiety of low, medium and high study habits of senior secondary school students in Ogun state, Nigeria and to find out if a significant relationship existed between study habit and students' Mathematics anxiety. The following statistical procedures were used for this study.

i. Analysis of Covariance (ANCOVA)
ii. t-test
iii. Pearson Product Moment Correlation Co-efficient (PPMC)

Result

A total of 180 high mathematics anxious students with low, medium and high study habits levels of study habit participated in this study and the results are presented below:

Analysis of Results on Hypothesis 1

1) There is no significant difference in the mathematics anxiety of secondary school students in Ogun West Senatorial District based on their study habit categorization (low, moderate and high)..

The results in Table 2 showed the mathematics anxiety scores of students that had low, moderate and high study habit respectively.

Table 2: Descriptive Statistics of Students with Low, Medium and High Study Habit and their mathematics anxiety Scores

			95% Confidence Interval	
Subject Study Habit	**Mean**	**Std. Error**	**Lower Bound**	**Upper Bound**
Low	40.07	3.24	33.50	46.64
Medium	42.35	2.96	36.35	48.35
High	43.95	3.52	36.83	51.07

The result in Table 2 showed that while the mathematics anxiety mean scores of students with low study habit was 40.07; the mean score of students with moderate study habit was 42.35 and those with high study habit was 43.95 with estimated covariate of 89.54. This means that students with High study habit have higher level of mathematics anxiety, followed by those with moderate study habit and those with low study habit. Further analysis to determine significant differences of the mean scores is shown in Table 3 below

Table 3: Univariate Analysis of Covariance of the Differences in the mathematics anxiety Scores of Students with Low, Moderate, and High Study Habit

	Sum of Square	Df	Mean square	F	Sig.
Contrast	1251.50	2	139.06	2.69	.061
Error	1120.87	27	373.36		

The null hypothesis of no significant difference in the mathematics anxiety level of students with low, moderate and high study habit was not rejected because the results in Table 3 reveal that the mean scores of students' study habit (high, medium and low) were not significantly different as the calculated F-ratio was 2.69 at 2 and 27 degree of freedom and at P > 0.05 level of significance.

Analysis of Results on Hypothesis 2

There is no significant relationship between students' study habit and their level of mathematics anxiety

Table 4: Descriptive Statistics of Study Habits and Students' Mathematics Anxiety

	N	Minimum	Maximum	Mean	Std. Deviation
Study Habit	180	0	95.8	98.3	10.49
Mathematics Anxiety	180	0	58.6	75.05	11.01
Valid N (listwise)	180	0	7.8	7.50	2.79

In table 4 above, the mean score of students' study habit was 98.3 while the mean score of their mathematics anxiety 75.05. Also, while the standard deviation score of students' study habit is 10.49, the standard deviation of mathematics anxiety is 11.01. This means that the spread of the data set of students' mathematics anxiety is farther to the mean than their study habit. Pearson Moment Correlation Co-efficient was used to find out the level of relationship between study habit and mathematics anxiety of students as presented in Table 5 and 6 below:

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.142[a]	.020	.011	2.780

a. Predictors: (Constant), Mathematical Anxiety, Study Habit

Table 5 above shows a positive correlation co-efficient between study habit and mathematics anxiety of .142. This positive correlation means that as students' study habit increases, their level of mathematics anxiety increases.

Table 6: Relationship Between Study Habit and Mathematics Anxiety of Students

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
1 (Constant)	10.829	1.646		6.578	.000
Study Habit	-.024	.019	-.092	-1.313	.191
Mathematical Anxiety	-.025	.018	-.100	-1.421	.157

a. Dependent Variable: Score

In Table 6 above, the p value is set at 0.05, thus, the correlation coefficient (r value) .191 is not statistically significant. The null hypothesis of no significant relationship between students' study habit and their mathematics anxiety is therefore not rejected.

Discussion

The first hypothesis of no significant difference in the mathematics anxiety of secondary school students in Ogun West Senatorial District based on their study habit categorization (low, moderate and high) was not rejected as findings from the study showed no significant differences. Though it was predicted that the findings would not support the hypothesis that mathematics anxiety of students with high, moderate and low levels of study habits are statistically significantly different, findings however revealed statistically significant differences. Further findings of this present study also showed that the mathematics anxiety scores of participants with high study habits were higher (43.95) than the mathematics anxiety scores of participants with moderate (42.35) and low (40.07) study habit categorisation.

However, in the literature, study habit differences in relation to mathematics anxiety have not been widely established but few studies have found results that are consistent with this present finding. For instance, the study of Rodrigo (2020) on senior high school students in Mati, Phillipines which showed that students' study habit and mathematics anxiety do not significantly differ across their field of specialization concurs with the result of this study. Fernández, Wang, Ramirez and Villalobos (2021) also reported similar finding that supported the present study as it was shown that Latinx students who expressed a high degree of commitment and class participation in their mathematics classroom yielded higher levels of mathematics anxiety.

The possibility that students with high study habits are willing to study more because they have high expectations for themselves could make them more anxious. More so, in Nigerian modern society where overestimation of higher grades and high expectations of parents on the grades of their children/wards ((Ndukwu & Ndukwu, 2017) is the order of the day. This explanation is supported by the finding of Deb, Sibnath, Esben and Sun (2015) that academic pressure is a consequence of parental pressure which impacts students' mental health and leads to psychological problems related to mathematics anxiety. This means it is possible for students with high study habit to continue to have higher mathematics anxiety because of academic pressure caused by parental pressure. High mathematics anxiety scores could also be attributed to students with high study habits because mathematics is a major requirement for admission into higher institution and so such students may make their passing mathematics a "do or die affair'.

Moreover, this finding reinforces the general understanding that individuals who have high expectations never give up such expectations even when they have tried their best. Thus, expectations of higher grades may generate demanding academic tasks that can eventually increase academic pressure. Moreover, high study habits participants that were used for this study are preparing for their final examinations and may be desperate to pass mathematics because it is a major criterion for admission into higher institution. This means that when students fear mathematics as a subject, it tends to influence their attitudes to studying the subject.

The present study differs from the Deficit theory which posits that weak study habits, contribute to higher levels of mathematics anxiety (Tobias, 1985; Wittmaier, 1972). This means that while this

present study reported higher mathematics anxiety scores for students with high study habit, the Deficit theory of mathematics anxiety supports the fact that it is weak study habits that leads to high mathematics anxiety. This result however contradicts that of Aldrin, Estonanto and Ryan (2019) who found that most of the participants in their study who rated high on mathematics anxiety scale were also the same students who showed little or no interest in learning mathematics and that high mathematics anxiety occurs when students realize that their inability to understand and analyse what they are studying would lead them to failure. (Devine et al., 2012; Ma, 1999).

The second hypothesis which states that there is no significant relationship in the effect of study habit on the mathematics anxiety of students in Ogun West Senatorial District was not rejected as no significant although positive relationship was found in the two variables. This means that although the study habit of secondary school students in Ogun West Senatorial District have no significant influences on their mathematics anxiety scores, a positive relationship exists between these two variables.

The positive relationship of study habit with mathematics anxiety that this study found concurs with the studies of Hills and Benlow (2008), Hattie, Biggs, and Purdie (1996) and that of Okoiye, Okezie and Nlemadim (2017) which showed positive significant impact of study habit on mathematics anxiety of secondary school students in spite of geographical differences in the two studies. The Deficit theory of mathematics anxiety however, does not concur with the result of the present study as it suggests an inverse relationship between mathematics anxiety and study habit that may operate in two directions.

Firstly, mathematics anxiety may reduce individuals' participation in mathematics-related activities and secondly, mathematics failure may create more anxiety and avoidance of mathematics. (Lyons & Beilock, 2012). The study of Bakare (1977), Britton and Tesser (1991), Sweidel (1996), Zeidner (1998), Gettinger and Seibert (2002), Cates and Rhymer (2003), Brummer and Macceca (2008), Baskar (2012), Fannin-Carroll (2014) and Mohammed and Annand (2016), established an inverse relationship between mathematics anxiety and students' study habits.

Likewise, despite the fact that the study of Ogunsanya and Buraimo (2020) who revealed a significant composite influence of study habit and test anxiety on the academic performance of secondary

school students in Ogun state was conducted in the same state with this present study, it did not show similar result with this study. This may be attributed to the fact that while the study of Ogunsanya and Buraimo (2020) focused on the effect of study habit on general anxiety, this present study investigated study habit impacts on mathematics anxiety.

However, the study of Musch and Broder (1999) which investigated the relative contribution of mathematics anxiety, study habits and academic performance in a statistics examination agreed with the result of this study as no relationship was found between the two variables in spite of differences in the research contexts of the two studies (in terms of the exposure of learners to different teachers, school environment, teaching methods and principles, learning facilities and the likes). These results have partly shown the need for more robust student support frameworks and other student support services through the professional development of student services staff (Fox, Thrill, & Keist, 2018).

In addition, although the finding of no significant relationship between mathematics anxiety and study habit of secondary school students reported in this study is not widely established in research, it can be the basis of developing further research and theories in the future since the implication of the finding is that study habit of secondary school students in Ogun West Senatorial District does not have sufficient weight to have significant impact on the mathematics anxiety of such students. This means that apart from study habit, there could be other personal factors (students' self-perception, predispositions, worldly experiences in mathematical problem solving and the likes) and external factors (teachers, parents, peer group among others) that could offer a path for continued investigation. This explanation is supported by the finding of Rada and Lucietto (2024) who investigated global literature through themes commonly associated to a person's mathematics anxiety and reported the influence of individual's previous mathematics performance and environmental impacts such as education systems familial relationships and resources as well as society-held view-points affect students' mathematics anxiety level.

Conclusion

This study has been able to improve knowledge on the basis of no significant relationship between study habit and mathematics anxiety level of secondary school students in Ogun West Senatorial

District, Nigeria and that mathematics anxiety is not statistically significant with any level of study habit categorisation (low, moderate and high). This suggests that other factors other than the study habits must be responsible for mathematics anxiety. Even when a relationship or effect existed it was discovered that mathematics actually drives study habits of students. Future researchers could study psychological and physiological variables of mathematics anxiety and the treatment package interventions of reducing it right from primary schools to establish veritable template for the future of the youths since mathematics is compulsory for their educational advancement and attainments in life.

Recommendations

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

i. The Nigerian Educational Research and Development Council (NERDC) should include study habit techniques in the secondary school curriculum.
ii. Reinforcing techniques that could make the learning of mathematics become interesting rather than a pain should also be used by teachers in the classroom.
iii. Mathematics teachers should be encouraged to go for professional development to enhance their effectiveness in teaching their students and making mathematics more interesting.
iv. A similar research could however be conducted to investigate other causes of mathematics anxiety among secondary school students.

Implications of the Study

The major contribution of this study drew the attention of educational stakeholders (teachers, counselors, administrators, policy makers, government and the likes) in Nigeria and other nations of the world to the importance of other individual student factors that could affect students' mathematical skills apart from study habits. Teachers, counselors and the Nigerian Ministry of Education (in particular) should also be more proactive in guiding students to cultivate effective study habits because of its positive relationship with mathematics anxiety that was reported in the present study. This is particularly

necessary in the light of 21st century's drive for scientific and technological development in most nations of the world and the fact that mathematics as a subject is important for this drive. As society continues to advance in education at an accelerated pace, proper interventions are needed to allow mathematically anxious individuals to thrive and scaffold their learning to develop a complete understanding of mathematics anxiety,

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