



**EFFECT OF DYSLEXIA AND DYSCALCULIA ON TEACHING AND LEARNING
MATHEMATICS AND SCIENCES AMONG SECONDARY SCHOOL STUDENTS IN
KURUDU EDUCATION ZONE, FCT, ABUJA**

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Abstract:

This study examined the effect of dyslexia and dyscalculia on teaching and learning Mathematics and sciences among secondary school students in Kurudu Education zone, Federal Capital Territory (FCT). Abuja, Nigeria. The study employed ex-post-facto survey research design. All public and private senior secondary two (SSII) students in Kurudu Education Zone, Federal Capital Territory, and Abuja were the target population for the study. Through Simple random sampling techniques, the sample size of two hundred (200) students were randomly drawn from four different schools within the study area. This study used an instrument called a Structured Questionnaire (SQ) constructed by the researchers and validated by experts in the field of Mathematics Education and Measurement and evaluation. The Reliability index of SQ was 0.81 using Kuder-Richardson 20 (KR-20) formula. Five research questions were stated to guide the study. Data collected were analyzed using chi-square and tested at alpha = 0.05 level of significance. The results of the study revealed among others that; teachers- students' relationship has a significant effects on dyslexia and dyscalculia among secondary school students; the application of different teaching method combined with the use of teaching aids gives room for self-expression and a reduction in dyslexia and dyscalculia. From the findings therein, the study recommended among others that, teachers should discover the best method that will bring the best performance out of their students; Students should belief in themselves and try to exhibit positive self-judgment. If the students belief that they can, it will increase their strength, encourage them to try several problems and their intelligence ability will open their effort in finding the best method that will bring the best performance out of the them. The importance

of teaching aids should not be undermined. Right/wrong answers should be discouraged; rather, emphasis should be laid on steps taking while marking Mathematics exercise so as to reduce poor performance to the barest minimum; Continuous assessment should also be encouraged and various techniques should be adopted in conducting the continuous assessment. Various method such as project work, take home assignment, open book test etc. should be employed so as to reduce failure to the barest minimum.

Keywords: Dyslexia and dyscalculia; Mathematics; Teaching and learning; Students

Introduction

Mathematics is seen from the public domain to be a difficult subject due to its abstract nature. The difficulty of learning mathematics is a worldwide or global issue. It is a very vital and compulsory subject in school education because of its linkage to everyday human endeavor or life in the society. Thus, it is taught as a fundamental subject in schools all over the world and positioned as an important subject in the school curriculum. Mostly in mathematics and science, several students believe that it takes inherent ability or even brilliance to achieve well, rather than perseverance, good strategies, help from others, and learning over time (Hong & Lin-Siegler, 2012). . As a result, it has always been given special attention in school education globally. Although the expected outcomes in mathematics could not be achieved to date and the students' negative attitude towards learning mathematics also could not be reduced (Ashcraft & Faust, 2014). According to Baccaglini-Frank and Di Martino (2020)., for several years, it was believed that the numerical cognition of the children could be developed according to the child development and the learners can be taught effectively using Piaget's child developmental stages (Piaget, 1952). The focus of Piaget's philosophy was that the child understands space, time and causality of number and quantity and classes and relations of invariance and change.

Nowadays, nevertheless, the researchers /scholars are focusing increasingly on the causes of mathematical teaching and learning difficulties as the procedural as well as neurobiological foundations of the learner (Sharma, 2020). Mathematics is conceived as a product of human activities in the process of adapting to the external environment. (Baccaglini-Frank & Di Martino, 2020). The exact acquisition of mathematical abilities involves a broad range of different general

cognitive skills including auditory and visual working memory, pattern recognition, speed of information processing, spatial perception, and attention (Leikin,2020).. These skills enable students to perform different mathematical activities and performance. Among them, working memory is a strong predictor of mathematical skills across time, achievement or achievement growth in mathematics (Geary, 2020). It aids to perform fast and accurate arithmetical calculations in adolescence and adulthood (Tolar, Ledarbary & Fletcher, 2009). Researchers have generally agreed that the deficit in working memory, brain-related condition, genetic cause, environment, and brain difference is considered dyslexia and dyscalculia (Hornigord, 2015). These deficits affect the students' / (learners' mathematical learning capability specifically computation and logical reasoning (Khing, 2016). Such problems faced by the student progressively tend to create frustration to learn mathematical problems regarding computation and application (Chinn, 2015). The problem of this research therefore is; what is the effect of dyslexia and dyscalculia on teaching and learning Mathematics and sciences among senior secondary school students in Kurudu-FCT, Abuja, Nigeria.

Objectives of the Study

The study sought to examine:

1. whether positive self-esteem can lead to a reduction in dyslexia and dyscalculia;
2. whether the application of different teaching methods combined with the use of teaching aids gives room for self-expression and a reduction in dyslexia and dyscalculia;
3. if dyslexia and dyscalculia have any effects on students' poor performance in Mathematics;
4. Whether the effective communication between the teachers and the students can lead to a reduction in dyslexia and dyscalculia among secondary school students and
5. if emotional disturbance have any effect on students' thinking ability and an increase in dyslexia and dyscalculia.

Research Questions

This study addressed the following research questions:

1. Does positive self-esteem lead to a significant reduction in dyslexia and dyscalculia?

2. How significant can the application of different teaching method combined with the use of teaching aids gives room for self-expression and a reduction in dyslexia and dyscalculia?
3. Do dyslexia and dyscalculia have any significant effects on students' poor performance in Mathematics?
4. How significant can effective communication between the teacher and the students lead to a reduction in dyslexia and dyscalculia among secondary school students'?
5. Does emotional disturbance has any significant effect on students' thinking ability and an increase in dyslexia and dyscalculia?

Literature Review

This subheading entails theoretical framework/conceptual presentation and previous studies on variables of the present study. These variables include Concept and meaning of dyslexia and dyscalculia; effect of dyslexia and dyscalculia in students. These were discussed as follows:

Concept and Meaning of Dyslexia and Dyscalculia

Dyslexia deals with the learning disability that affects learner's ability to read and to comprehend Mathematics language/terminologies. This equally affects other aspects of student's lives, including their scientific and mathematical abilities. Therefore, dyscalculia is an impair ability to learn basic Mathematics concepts. It is one of the most crucial problems of learning Mathematics in secondary schools. In the same manner, dyslexia and dyscalculia are the predominant emotional, physiological and sociological problems associated with Mathematics learning and other sciences such as Physics, Chemistry etc. According to Baloglu and kocak (2006), approximately 60% and above of dyslexics have problems with Mathematics. Frequently, this is mistaken as another learning difficulty referred to as dyscalculia.

Dyscalculia on the other hand, refers to the manifestation of vague and unpleasant emotion experienced in a learner which interferes with the manipulation of numbers and solving of Mathematics problems and sciences. Several students who suffer from dyscalculia have little confidence in their ability to study Mathematics. Dyscalculia is quite rare and individuals diagnosed as possessing this disorder are often actually dyslexic. There are treatments and therapies available to dyscalculia individuals seeking to improve their

mathematical skills. From the researcher's point of view, Mathematics language refers to the collection of signs or symbols, abbreviations, axioms, lemma, methods, formulae, and units that are necessary in sciences and Mathematics teaching and learning. Specific vocabulary that refers to quantities and spatial placement tend to create problems for dyslexic students. These include words and phrases such as before, after, more than, less than, and between. It is difficult for dyslexic students to understand the meaning of such words in relation to Mathematics and other science subjects.

Dyslexia is most dominant among secondary school students. Ashcraft and Faust (2014) expressed that dyslexia and dyscalculia in Mathematics has been ascribed to the feeling of tension, helplessness, mental disorganization, and dread one has when required to manipulate numbers and shapes and solving of scientific and mathematical problems. Norwood (1994) also stressed that dyslexia and dyscalculia did not appear to have a single cause but it was the result of various different factors such as truancy, poor self-image, poor coping skills, teacher attitudes and emphasis on learning through drill without understanding. Ma and Xu, (2004), Reynolds (2000), Salako and Amato (1995) were of the view that low grade or failure in Mathematics could also lead to Mathematics anxiety or increased existing levels of anxiety for Mathematics. However, Greenwood (1984) stated that the principal cause of dyslexia and dyscalculia has been in teaching methodologies. Greenwood further maintains that the problems dyslexia and dyscalculia could be minimized if teachers apply the problem solving process to the teaching of sciences and mathematics

Several students found learning sciences and mathematics boring, meaningless, and no-involving (Mitchell, 2004). Lack of motivation and other cognitive variables helps to explain the low level of students' competence in science subjects like Physics and Chemistry. A report on the future of science education (National Research Council, 1989), indicated that when Mathematics acts as a filter, it does not only filter students out of careers in sciences, but frequently out of school itself. Since mathematics is the core of sciences. Lack of confidence when working in mathematical situations is described by Stuart (2000) as the cause of dyslexia and dyscalculia.

Tobias (1978) believed that word problems are the heart of science subjects. Learners need higher O'levels of reasoning to solve sciences and Mathematics problems, otherwise learners may grow up avoiding Mathematics and sciences. Newstead (1998) found that when students were asked to perform and provide

explanations in front of teacher or peers, constructive arguments by the peers and careful guidance by their teacher of sciences help to minimize ambiguity that could cause dyslexia and dyscalculia. Newstead concluded that learners learn how to do sciences and Mathematics before they are able to explain problems and communicate it proficiently. Kogelman and Kulm, (2015) submitted that experience of learners when punished or humiliated in class was very damaging. Preckel and Brull (2010) stressed that teachers -student relationship impact positively on students, developing a sense of self and promoting resiliency in them.

Dyslexia and Dyscalculia is quite varied both in symptoms and causes. Dyslexia causes children to struggle with reading Often the symptoms when encountering Mathematics anxiety are physiological such as sweaty palms, nausea, heart palpitations, a hot tingling feelings, stomach aches or stomach cramps and tightening muscles (Clawson, 1991; Godbeg, 1997; Perry, 2004). Sometimes the symptoms are psychological, such as paralysis of thought, extreme nervousness, inability to hear the teacher, tendency to become upset by noises, inability to concentrate or loss of concentration, preoccupation with intrusive thoughts and worries, and a general sense of uneasiness (Ashcraft & Kirk, 2001).

The causes of dyscalculia are varied. "Anxious students have difficulty in learning mathematics in the first place, difficulty in using or transferring knowledge from one concept to another, and difficulty demonstrating their knowledge on tests" (Slavin, 2003). Some causes "includes under-preparedness, absences from school, parents perpetuating the myth that Mathematics ability is hereditary, and negative past experiences with teachers" (Godbeg, 1997). Dyscalculia has been related to personality type, a negative attitude towards Mathematics, Mathematics avoidance, Mathematics background, instructor's behaviour, level of mathematics involvement, lack of confidence, and negative school experiences (Bursal & Paznokas, 2006).

Many factors have been described as the causes of dyslexia and dyscalculia. Norwood (1994) described dyslexia as the inability to handle frustration, excessive school absences, poor self-concept, parental and teacher attitudes towards mathematics and emphasis on learning Mathematics through drill without understanding. Lack of confidence when working in mathematical situations has been described by Stuart (2000) as the cause of Mathematics anxiety. Hodges (2017) argues that failure or success in Mathematics may be related to individual learning styles and more specifically with the coupling of learning styles and the way in which material is presented.

Effect of Dyslexia and Dyscalculia in Students

Dyslexia and dyscalculia often compounded over time and can affect students in a variety of ways. Dyslexia and dyscalculia can begin at any age of schooling even as young as elementary school, but most students commonly have negative experiences between seventh and tenth grades (Clawson, 1991). Unless addressed directly, this anxiety often continues or even worsens through high school, college and adulthood.

Dyslexia and dyscalculia is not only difficult for the students to deal with, but it compounded into lack of understanding of major concepts. This can close doors for students in their chosen careers if they are studying mathematics either directly, or indirectly. Lack of understanding of basic mathematical principles can be ascribed to inability to solve chemistry, engineering, and other scientific problems (Bursal & Paznokas, 2006). To Bursal and Paznokas, dyslexia and dyscalculia stops students from acquiring logic and reasoning skills that can be used in variety of areas, even outside the realm of Mathematics.

Review of Previous Studies

Previous studies simply means studies earlier conducted or carried out by different researchers/scholars with empirical findings reported in reputable Journals, Dissertations and Theses. Oginni and Olugbuyi (2014) studied an appraisal of sciences and mathematics dyslexia and dyscalculia syndrome among secondary school students. This study investigated the impact of student's dyscalculia and dyslexia on the teaching and learning of science and mathematics among secondary school students. A descriptive research of survey was adopted for the study. The instrument used to collect data was a structured questionnaire (SQ) designed to elicit response from 200 students that were selected randomly from schools. Data collected were analysed using chi-square. The findings revealed that teachers' students' relationship has a significant effects on dyslexia and dyscalculia among secondary school students. Based on the findings, it was recommended that, teachers should discover the best method that will bring the best performance out of their students. However, continuous assessment and individual differences in learners should be prioritized. The similarity between the former study and the present study is that both studies dwelt on the effect of dyslexia and dyscalculia among secondary school students and similar method of data analysis but differs in terms of research design and the study area.

Orim and Igwe (2017) researched on correlates of dyscalculia and learning outcome in Mathematics among SSII students in Obudu, C.R.S- Nigeria. Types of dyscalculia like; sequential, verbal, practognostic and operational dyscalculia are discussed. Tips on how to reduce dyscalculia are listed in the work. The survey research design was adopted for the study. A sample of 200 students was randomly drawn for the study. Data generated were subjected to statistical analysis using Pearson product moment correlation analysis at 0.05 level of significant. Results obtained show among others that dyscalculia significantly correlates with students learning in mathematics. Based on this, it was recommended among others that students should engage in practice, extra-time, graphicalized their work and evaluate their work.

Yoong, Gengatharan and Amat Yasin (2022) conducted a study on the survey of the problems of dyscalculia in primary schools. The researchers employed quantitative design to carry out the study. Survey method is used to collect the data. Descriptive and inferential statistics are used to analyse the survey data. A study was conducted with 381 primary schools Mathematics teachers in Malaysia. Means and standard deviation were used to analyse the level of problems of dyscalculia, whereas independent t-test were used to compare the level of problems of dyscalculia between school locations. The results show that the level of problems of dyscalculia is medium high ($M=3.31$, $\sigma=0.97$). On the other hand, the problem of dyscalculia in rural area is slightly higher ($M=3.822$, $\sigma=0.697$) than the urban area ($M=3.717$, $\sigma=0.696$). In short, there is no significant difference for the level of problems of dyscalculia between different school locations ($p=0.147$, $p>0.05$). As a conclusion, interventions and diagnosis need to be carried out in order to improve the capabilities of these pupils to the maximum.

In studies carried out by Sukri (1996) and Jasmani (2005), revealed that many students have moderate levels of dyslexia when it comes to learning of non-science subjects. Anxiety and unstable innate tendencies has become a serious concern in explaining dyslexia and dyscalculia issue. Evidence of students' poor attitude and high levels of dyslexia and dyscalculia towards sciences and Mathematics is highly reflected in their performance in recent times. Poor grades of result in Mathematics specifically in the "West African Examination Council (WAEC), "National Examination Council" (NECO) and declining scores in "Unified Tertiary Matriculation Examination (UTME) call for concern among scholars. National Bureau of Statistics, (2007) ascribed this to several factors among which

dyslexia has taken a centre stage. The similarity between the former study and the present study is that both studies dwelt on dyslexia and dyscalculia but differs in the area of research design employed.

Most studies reviewed above are related to the present study. However, none of the studies is identical to the topic of the present study. No researcher seems to have carried out a study on the effect of dyslexia and dyscalculia on teaching and learning of Mathematics and sciences among secondary school students in Kurudu Education zone, Federal Capital Territory (FCT)-Abuja, Nigeria in particular. On the basis of this, the researcher deems necessary to carry out a study on effect of dyslexia and dyscalculia on teaching and learning Mathematics and sciences among secondary school students in Kurudu Education zone, Federal Capital Territory (FCT)-Abuja, Nigeria in particular. This is the gap the present study sought to fill

Method and Materials

This study was conducted in Kurudu Education zone, Federal Capital Territory, Abuja, Nigeria. The study employed an ex-post-facto survey research design. According to Büyüköztürk, Çakmak, Akgün, Karadeniz and Demirel (2010), an ex-post-facto is a design aimed at establishing possible causes and effects for behavior pattern by comparing subjects in whom it absents to a lesser degree. Also, the design is deemed appropriate for the study because it does not involve manipulation or control of independent variables (dyslexia and dyscalculia) or have already occurred. All public and private senior secondary two (SSII) students in Kurudu Education Zone, Federal Capital Territory, Abuja was the target population for the study. Through simple random sampling techniques, the sample size for the study was drawn from both public and private secondary schools. This study used an instrument called a questionnaire. The questionnaire was divided into two sections; section A contains items designed to elicit personal or bio data of the respondents such as sex, age, class and departments. Section B, contains items on the effects of anxiety on teaching and learning Mathematics and sciences among secondary school students. For the validity and reliability, the instrument was subjected to content and face validity by experts (Mathematics educators) and those in measurement and evaluation. The instrument was comprehensively appraised and the corrections, recommendations and suggestions made by these experts were used to prepare the final copy of the instrument. Also, the reliability index was computed using

Kuder-Richardson 20 (KR-20) formula. The reason for the choice of KR-20 is due to the fact that the instrument was administered to participants once and dichotomously marked and scored. The research instrument was administered by the researcher with the help of research assistants (Mathematics class teachers). The data obtained was analyzed using Chi-square and tested at $\alpha = 0.05$ level of significance.

Presentation of Results

Whether Positive Self-esteem lead to a significant reduction in Dyslexia and Dyscalculia

The results of chi-square carried out to examine whether positive self-esteem lead to a significant reduction in dyslexia and dyscalculia are shown Table. Does positive self-esteem lead to a significant reduction in dyslexia and dyscalculia? The data used to answer to this research question were presented in Tables 2.

Table 1: Contingency Table for the expected frequency

S/n.	Items	SA	A	D	SD	TOTAL
1	Low Self- esteem causes dyscalculia and dyslexia	173	224	277	326	1000
2	Dyscalculia and dyslexia affects Learning styles	435	303	138	124	1000
3	Degree of performance in Mathematics could be measure through dyscalculia syndrome	265	298	174	263	1000
4	Teachers students relationship catalysis dyscalculia and dyslexia	318	249	142	291	1000
5	Emotional intelligence could be identified through dyscalculia and dyslexia	325	321	199	155	1000

Table 2: Positive Self-esteem lead to a Significant Reduction in Dyscalculia and Dyslexia

	O	E	(O-E)	(O-E) ²	(O-E) ² /E
SA	35	50	-15	225	4.5
A	45	50	-5	25	0.5
D	55	50	5	25	0.5

SD	65	50	15	225	4.5
TOTAL	200	200		χ^2	10

$$Df = (n-1) = 4 - 1 = 3$$

In Table 2, at alpha level of 0.05, the chi-square tabulated value (critical value) for $df = 3$ is 7.83. The calculated value was found to be 10. From the fact that the calculated value was greater than the chi-square tabulated value ($10 > 7.83$), it is evident that positive self-esteem lead to a significant reduction in dyscalculia and dyslexia.

Whether the Application of different Teaching Method combined with the use of teaching aids gives room for Self-expression and a reduction in Dyslexia and Dyscalculia

The results of chi-square carried out to examine whether the application of different teaching method combined with the use of teaching aids gives room for self-expression and a reduction in dyslexia and dyscalculia is significant. How significant can the application of different teaching method combined with the use of teaching aids gives room for self-expression and a reduction in dyslexia and dyscalculia? Data used to answer this research question were presented in Table.

Table 3: Chi-square Table for Learning style and Dyslexia and Dyscalculia

	O	E	(O-E)	(O-E)²	(O-E)²/E
SA	87	50	37	1369	27.38
A	61	50	11	121	2.42
D	28	50	-22	501.8	10.04
SD	25	50	-25	635	12.7
TOTAL	200	200		χ^2	52.54

$$Df = (n-1) = 4 - 1 = 3$$

In Table 3, the chi-square tabulated value (critical value) for $df = 3$ is 7.83 at alpha = 0.05 level of significance. From the fact that the calculated value (52.54) is greater than the chi-square tabulated value (critical value) (7.83), the application of different teaching method combined with the use of teaching aids gives room for self-expression and a reduction in dyslexia and dyscalculia. This means that effective learning styles, through the application of different teaching methods, with the use of teaching aids turns Mathematics concepts from abstract to real

situation, which eventually give rooms for self-expression, which leads to low level of dyslexia and dyscalculia.

Effects of Dyslexia and Dyscalculia on students' poor performance in Mathematics

The results of chi-square carried out to examine whether Dyslexia and Dyscalculia have any significant effects on students' poor performance in Mathematics. Do dyslexia and dyscalculia have any significant effects on students' poor performance in Mathematics? The data used to answer this research question were presented in Table.

Table 4: Chi-square Table for Students' Performance in Mathematics

	O	E	(O-E)	(O-E) ²	(O-E) ² /E
SA	53	50	3	9	0.18
A	60	50	10	100	2
D	35	50	-15	225	4.5
SD	52	50	2	4	0.08
TOTAL	200	200		X ²	6.76

DF= (n-1) = 4 - 1 = 3

As seen in Table 4, the chi-square tabulated value (critical value) for df = 3 is 7.83. at alpha = 0.05 level of significance. It is obvious that the calculated value was less than the chi-square tabulated value; thus, shows obviously that poor performance lead to lack of curiosity and discouragement in Mathematics, which at the end increases tension. Effective communication between the teacher and the students with a reduction in the use of punitive measure such as open disgrace, insults, raining of abusive words and the use of cane when a student miss a concept in Mathematics class lead to a reduction in Mathematics anxiety.

Effective communication between the teacher and the students leads to a reduction in Dyslexia and Dyscalculia among Secondary School Students

The results of chi-square carried out to examine if the effective communication between the teacher and the students' leads to a reduction in dyslexia and dyscalculia among secondary school students is statistically significant. How significant can effective communication between the teacher and the students

leads to a reduction in dyslexia and dyscalculia among secondary school students? Data used to answer this research question were presented in Table.

Table 5: Chi-square Table for Teachers – Students’ Relationship

	O	E	(O-E)	(O-E) ²	(O-E) ² /E
SA	64	50	14	196	3.92
A	50	50	0	0	0
D	28	50	-22	484	9.68
SD	58	50	8	64	1.28
TOTAL	200	200		X ²	14.88

$$DF = (n-1) = 4 - 1 = 3$$

As seen in Table 5, the chi-square tabulated value for 3df = 3 is 7.83 at $\alpha = 0.05$ level of significance. From the fact that the calculated value (14.88) is greater than the chi-square tabulated value, hence positive attitudinal disposition of teacher towards the students whenever they miss a concept in Mathematics class rather than punitive measure such as curses, open disgrace, insults, raining of abusive words and the use of cane lead to freedom of expression, which stimulate the students to try more. This ultimately leads to a reduction in the level of fear, apprehension, tension and Mathematics anxiety among students.

Effect of emotional disturbance on students’ thinking ability and an increase in dyslexia and dyscalculia

The results of chi-square carried out to examine if emotional disturbance has any significant effect on students’ thinking ability and an increase in dyslexia and dyscalculia. Does emotional disturbance has any significant effect on students’ thinking ability and an increase in dyslexia and dyscalculia?

Table 6: Chi-square Table for Emotional intelligence and Mathematics anxiety

	O	E	(O-E)	(O-E) ²	(O-E) ² /E
SA	65	50	15	225	4.5
A	64	50	14	196	3.92
D	40	50	-10	100	2
SD	31	50	-19	361	7.22
TOTAL	200	200		χ^2	17.64

$$DF = (n-1) = 4 - 1 = 3$$

As seen from Table 6, the chi-square tabulated value (critical value) for $df = 3$ is 7.83, with $\alpha = 0.05$ level of significance. Due to the fact that the calculated value (17.64) > the chi-square tabulated value (7.83), this signifies that emotional disturbance such as frustration, worried, fear etc increases the level of Mathematics anxiety in the classroom situation.

Discussions

The study has extensively revealed a lot of factors which leads to a high level of Mathematics anxiety among secondary school students. From the results gathered, it was observed that negative self-esteem leads to a high level of Mathematics anxiety. The findings revealed that self-condemnation lead to self-defeat, poor performance and failure in Mathematics.

The results revealed that understanding Mathematics concept instead of cramming the solution through the application of different teaching methods leads to a reduction in the level of mathematics anxiety. It shows the important role of teaching aids on learning process because it transform the concepts from abstract to real situation which stimulate the students interest.

The findings show that the degree of performance in Mathematics and Mathematics anxiety are related. Poor performance lead to lack of interest which subsequently lead to high level of mathematics anxiety. This agreed with the views of Ma and Xu,(2004), Norwood, (1994), Reynolds (2000) , Salako and Amato (1995) that low grade or failure in Mathematics could also led to mathematics anxiety or increased existing levels of anxiety for Mathematics.

The result also revealed that students –teachers relationship has a significant level on Mathematics anxiety among secondary school students. It shows that positive attitudinal dispositions of the teacher towards the students whenever they miss a concept in Mathematics class rather than punitive measure such as curses, open disgrace, insults, raining of abusive words and the use of cane lead to freedom of expression, which encourage the students to try more. This result is in line with that of Ogini and Olugbuyi (2014) who revealed that teachers -students relationship has a significant level on Mathematics anxiety among secondary school students. This result/finding also depicts the view of Kogelman and kum (2015) that experience of learners when punished or humiliated in Mathematics class was very damaging. It also agreed with the views of Preckel, and Brull, (2010) that teachers -student relationship impact positively on students, developing a sense of self and promoting resiliency in them.

The result also shows that emotional intelligence such as emotional disturbance, frustration, worried, fear increases the level of mathematics anxiety. These results agreed with the views of Ashcraft and Faust (2014) that highly anxious mathematics individuals will be less fluent in computation, less knowledgeable about mathematics and less likely to have discovered special strategies and relationship within the mathematics domains.

Conclusion

Based on the results of the study, the following conclusions were drawn. Self-judgment and determination goes a long way in the learning outcomes of students. If the students view themselves positively, believing that they have the ability and the potential to perform excellently well in mathematics, this will inject some strength and interest in them. Hence, positive learning outcomes in Mathematics are likely to be obtained. Self-condemnation on the other hand destroy the students confidence and lower there morals. These hasten the rate of fear, tension and anxiety which leads to poor learning outcomes in Mathematics. Teacher's method of presenting behavioural objectives goes a long way in determining the performance of the students. The method used by the teacher either boost the students morale in Mathematics or discourage them, depending on the knowledge of the subject matter, preparation on the part of the teacher, presentation and the nature of the teaching aid employed in the process. Poor performance weakens the morale of the students which results to lack of interest. Poor performance was caused by series of mistakes and mistakes on the other hand was a result of fear, uneasiness, tension and frustration. All these lead to high level of Mathematics anxiety. Positive teachers-students relationship increases the level of freedom of the students or increases their level of closeness and interaction with the teacher. This closeness encourages the students to ask questions and express their opinion because the assurance is there that even if they miss it the teacher will definitely correct their mistakes. This positive relationship encourages the students to try more problems, which leads to a reduction in the level of Mathematics anxiety. Emotional disturbance during Mathematics class leads to less frequent in mathematical computation and manipulation of numbers and more mistakes. However, this result in poor performance in mathematics which results in discouragement and finally high level of mathematics anxiety.

Recommendations

Based on the findings of this study, the following recommendations were advanced by the researchers:

1. One-on-one instruction is essential for all children - especially those with learning difficulties. Create a set study time after school when you'll be available to help your student with homework.
2. Students should belief in themselves and try to exhibit positive self-judgement. If the students belief that they can, it will increase their strength, encourage them to try several problems and their intelligence ability will open their effort in finding the best method that will bring the best performance out of the students. The importance of teaching aids should not be undermined. Right/wrong answers should be discouraged; rather, emphasis should be laid on steps taking while marking Mathematics exercise so as to reduce poor performance to the barest minimum.
3. Continuous assessment should also be encouraged and various techniques should be adopted in conducting the continuous assessment. Various method such as project work, take home assignment, open book test etc. should be employed so as to reduce failure to the barest minimum.
4. Students should try to avoid situation that can create emotional imbalance. In case of an inevitable situation, students should relax by playing games, watching films or listening to music to ease their tension before coming back to solve Mathematics problems.
5. Teachers should always try to bear the issues of individual difference while attending to his students. They should try to counsel their students whenever they notice something strange like fear, worrying, frustration or any sort of emotional disturbance in their students that can hinder absolute concentration.

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