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The Effects of Mathematics Anxiety on Mathematics Performance among Secondary School Students in Tanzania: A Case of Arusha City Council

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Abstract:
The continuous trend of poor mathematics performance in Tanzania has developed different stakeholders' attention, including the Government, to research the possible causes of poor performance. The presence of mathematics anxiety among students is believed to have an impact on students' performance in Mathematics. In this study, the researcher aimed to investigate the effects of Mathematics Anxiety on Mathematics Performance Among Secondary Schools Students in Tanzania. The study employed a sample size of 396 students from six secondary schools in the Arusha City Council. The researcher collected data through structured questionnaires with closed-ended questions distributed to respondents. Respondents' mathematics terminal examination marks were used in this study. The collected data were analysed using descriptive (percentages and mean) and inferential statistics (correlation and multiple regression analysis). The results generally revealed a significant effect of mathematics anxiety on mathematics performance among secondary school students at a 0.05 level of significance (P-Value 0.00 2- tailed). A correlation coefficient r = 0.304 indicate a significant moderate positive relationship between the effects of mathematics anxiety and mathematics performance. The regression equation $y = 2.698 + 0.468x$ indicates that mathematics anxiety affects mathematics performance by 46.6% when other factors remain constants. Based on the findings, it was recommended that mathematics teachers be aware of the possibility of mathematics anxiety among their students. Also, further studies that involve a large sample should be conducted to re-confirm the assertion.

Keywords: mathematics anxiety; mathematics performance; secondary school students

1.0.Introduction

Worldwide, mathematics is given paramount importance. It is learned not only for success in examinations but also for our life. It is a gate to science and technology, which are the requirement for the development of any country socially and economically (Mbugua, 2012; Tshabalala & Ncube, 2016). In this world of new technologies and heavy sciences, mathematics abilities are essential for understanding disciplines related to science, technology, engineering, and other fields. They say that 'without mathematics, there is no science, without science, there is no modern technology and without modern

technology, there is no modern society' (Sa'ad, Adam, & Sadiq, 2014). Mathematics is considered a ticket out of poverty and social degradation in the countries like Eastern Europe, India, and China. Individually, mathematics is very much applicable in our daily life. It can develop an individual mind since it enhances reasoning, analytical thinking and quickens the mind. Looking at our daily activities, mathematics applies to cooks, farmers, carpenters, mechanics, shopkeepers, doctors, and musicians, to mention a few. Therefore, we can say that everybody needs mathematics (Shishigu, 2018).

Understanding this, many countries in the world, including Tanzania, have put more emphasis and effort

towards studying mathematics and science subjects (Nathan & Jackob, 2020). Mathematics is given paramount importance in the curriculum and the education system from all levels of education in Tanzania. It is one of the subjects which is taught compulsory from pre-primary to secondary schools. This is because it is the link to science subjects. The government and non-government organisations have been investing a lot in improving the education system in Tanzania. Students have been encouraged to study and choose science and mathematics (STEM) for their future careers and a nation's development.

Despite its significance and application in real life but performance of mathematics worldwide has never been good. Many researchers complain about the poor performance of mathematics in almost all countries in the world (Galadima & Yusha'u, 2007; Garba et al., 2020; Mazana, Montero & Casmir, 2019). Also, mathematics performance is not encouraging in developed countries like America, Europe and Asia. A study by Jha (2012) shows the presence of poor performance in mathematics and suggests possible ways to increase performance. In Tanzania, there has been a continuous trend of poor performance, which is seen after the outcome of the national assessment done every year for both the Form Two National Assessment (FTNA) and Certificate of Secondary Education Examination (CSEE). As summarised in the table below, the CSEE results from 2016 to 2020 imply a mathematics performance problem in Tanzania.

Table 1 CSEE Mathematics Performance from 2016 to 2021

Year/Performance	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Pass Rate (%)	18.12	19.19	20.02	20.03	20.12	19.54
Failure Rate (%)	81.12	80.81	79.98	79.97	79.88	80.46

Source: NECTA Results Statistics (2016 – 2021)

The continuous trend of poor performance in mathematics in Tanzania has called the attention of different stakeholders, including the government, to research the possible causes of poor performance. Factors such as inadequate teaching and learning materials, lack of enough competent teachers, low level of language proficiency, poor teaching methods, and overcrowded classrooms were mentioned as the causes of poor performance in Mathematics in Tanzania (Ponera, Mhonyiwa, & Mrutu, 2011; Nyandwi, 2014; Maganga, 2016; Mungure, 2017). Other factors include students' and teachers' negative attitudes towards mathematics (Michael, 2015; Abdala, 2017). Since limited studies were done on Mathematics anxiety in Tanzania, this study aimed to examine the effect of mathematics anxiety on mathematics performance in Tanzania, taking Arusha City Council Secondary Schools as a Case study. The hypothesis guided the study as follows;

H0 - Mathematics anxiety does not have a significant effect on secondary school students' mathematics performance.
H1 - Mathematics anxiety has a significant effect on secondary school students' mathematics performance.

2.0 Literature Review

Mathematics anxiety is a feeling of fear and tension towards mathematics which can result in an individual's inability to do mathematics (Richardson & Suinn, 1972). It is a discomfort state created when students are required to perform a mathematical task (Cemen, 1987). In addition, it is associated with a lack of self-confidence, which causes students to perceive mathematics as a difficult subject, creating fear of failure (Ramirez et al. 2016).

Students with mathematics anxiety may show physical symptoms such as nervousness, fever, sweating, and rapid heartbeat. They can also show behavioural symptoms such as body shacking and classroom avoidance, while the cognitive symptoms include mental confusion while doing mathematics and inability to concentrate in mathematics class. They believe that alone, they cannot perform any mathematics tasks well, so they are

coping with fellow students (Chang & Beilock 2016).

Often students who are fearful or those who believe that mathematics is not important are likely to avoid the study of mathematics, resulting in failure in the subject (Furner and Berman, 2005). Mutlu (2019) reported that students show a severe negative emotional response in situations that involve numerical and mathematical activities. Students can get math anxiety in the process of learning mathematics or can be influenced by assessment. Mathematics feature such as logic, problem-solving and precision develops a fear for some students leading to a dislike of mathematics (Richardson & Suinn, 1972). Mathematics anxiety is a problem that affects students at all levels of education worldwide, starting from elementary school students to university students (Mahmood 2010).

Mathematics anxiety is characterised by both short-term and long-term effects. The short-term effects may include avoidance, decreasing self-reliance, shame, helplessness, and compulsive behaviours. Some students may also be affected by psychological disorders such as increases in heartbeat rate, rapid breathing, and tremors (Şahin, 2018). Long-term effects can be a low achievement or poor success in mathematics courses which can affect the choice of their future carrier.

The study of Magnate (2022) on the relationship between the indicator of mathematics anxiety and mathematics performance discovered that there are indicators of MA that correlates positively to the performance of students in a mathematics course, but there were other indicators of MA that contribute negatively and has no relation to the mathematics performance. Example indicators such as fear of asking a question in class, fear of not completing the assignment, and fear developed when a mathematics teacher is teaching are all related positively to mathematics performance.

Essuman, Nyarko and Frimpong (2021) explore the impact of mathematics anxiety on the academic performance of junior high school pupils in the Bongo district of Ghana, and the results come out that mathematics anxiety negatively affects the mathematics performance of students.

Again, the results of Foley et al. (2017) have revealed Mathematics anxiety as one of the factors contributing to poor performance among students. Different research shows that there is a positive correlation between mathematics anxiety and math test anxiety (Magnate, 2022). The poor mathematics performance could be attributed to the mathematics anxiety they experience during examinations (Bentil, 2020).

Hamid et al. (2013) tried to examine the role of mathematics anxiety in mathematics achievement. The results showed that mathematics anxiety correlates negatively with mathematics achievement. Students who perform poorly in mathematics were seen to score significantly higher on negative mathematics anxiety than those with good performance (Daneshamooz & Alamolhodaei 2012). This is because mathematics anxiety hinders students' positive thinking about mathematics resulting in low self-esteem, disappointment, and academic failure.

Zakaria et al.; (2012), in their study on mathematics anxiety and mathematics achievement among secondary school students in Selangor, Malaysia, found that mathematics anxiety, which is a psychological factor, exists among students and can affect students' mathematics achievement. Mathematics anxiety exists at different levels, and that mathematics achievement differs between students based on the level of anxiety. Students with a high level of Mathematics anxiety can result into poor mathematics achievement (Ramirez et al. 2018).

A study by Scarpello (2007) revealed that 75% of Americans have stopped the study of Mathematics and avoid many careers related to mathematics. Mathematics anxiety is one of the main reasons for these avoidance behaviours (Suren & Kandemir, 2020). When students avoid mathematics, they become less competent and exposed and lose the ability to perform mathematically, resulting in poor performance.

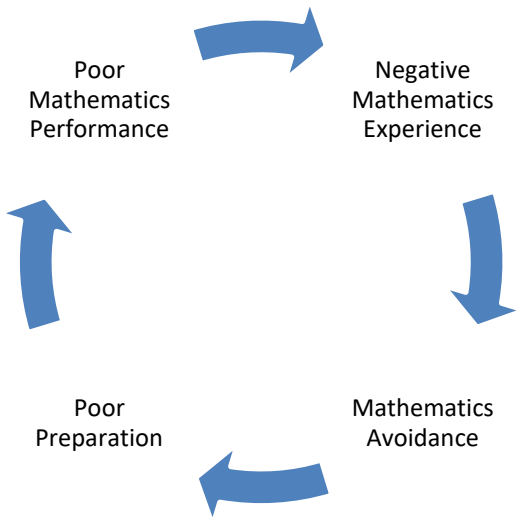
The outcomes of this research have led to investigations on the sources of students' math anxiety that result in mathematics failure. Some of the researched factors pinpointed as the causes of mathematics anxiety by various researchers include cognitive factors. These are students' inborn attributes, such as low intellectual or poor

cognitive attributes, where students become weak in numbers (Zettle & Raines, 2000). The second factor is personal factors. This refers to personal beliefs such as a negative attitude towards mathematics which develop low self-esteem and lack of confidence. Lack of confidence is the greatest challenge for learners with mathematics anxiety (Dodd, 1999). According to Tobias (1993), the belief that mathematics is gender-based can cause fear of mathematics among female students. Under environmental factors, the effects of parents, peers, and teachers are seen. Parents with mathematics anxiety can easily pass to their children, as students can miss parental support in matters related to mathematics (Wani, 2020). On the other hand, teachers experiencing math anxiety may affect students' interest towards mathematics in the process of teaching and learning (Mutodi & Ngirande, 2014**).** Namkung et al. (2019) found that the higher level of math anxiety and test anxiety is a result of poor test-taking strategies, inadequate test preparation, and psychological stress. Students can also develop Mathematics anxiety based on a previously gained experience, like when students are surrounded by relatives and other peers with the notion that mathematics is not an easy subject (Uusimaki & Nason, 2004).

2.1.Theoretical Framework

The concept of the effects of mathematics anxiety on mathematics performance is explained by the cycle of math avoidance model by Pries and Biggs' (2001). This theory focuses on explaining the cycle of mathematics avoidance. The model has four phases which repeat themselves. In the first phase, students experience negative mathematics experiences from different people, such as fellow students, parents, teachers, and society in general. The negative mathematics experience can be from past experience, including poor mathematics performance. The negative perceptions include statements such as mathematics is a tough subject, it is a subject of only bright people, and it has no application in future. After experiencing negative mathematics experiences, a student enters the second phase of mathematics avoidance. In this phase, students develop hate and fear towards mathematics, resulting in reduced effort in learning it. Students start dodging mathematics classes and not doing the assignments/homework. Avoiding mathematics classes results to phase three, which is poor preparation. It is developed due to a loss of interest towards mathematics. The last phase, which is poor performance, is the result of poor preparation. This model can be used to explain the effect of mathematics anxiety on mathematics performance. Mathematics anxiety can result in students' total avoidance of the subject and not doing mathematics tasks which, at the end of the day, results in failure.

Figure 1: Circle of Math Avoidance Model.



Source: Pries and Biggs' (2001)

3.0 Methodology

This study employed the correlation research design that draws a quantitative approach to obtain data about the Effects of Mathematics Anxiety on Mathematics Performance among Secondary School Students in Arusha City Council. This design was used because it is used to shows the relationship between two variables. The study population was counted at 35113 students from private and government secondary schools at Arusha City Council. The study randomly chose six (6) secondary schools in the Arusha City Council. The study employed simple random sampling to get 396 respondents for data collection by using Yamane formula. The study collected data through structured questionnaires with closed-ended questions that were distributed to respondents. The researcher used a questionnaire because it is appropriate for generating quantitative data that can be used in the statistical analysis. Each respondent was required to choose one answer by indicating their level of agreement or disagreement on the given ten statements about the effect of mathematics anxiety based on the five-point Likert scale, which shows 1= Strongly disagree, 2 = disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree. To get the mathematics performance of each respondent, a checklist was used to get their mathematics end-of-term examination scores. The collected data were analysed by using descriptive and inferential statistics with the aid of SPSS 26. The effects of mathematics anxiety were summarised descriptively by using frequency, percentage and mean. In inferential statistics, the researcher runs both correlation and multiple regression analyses. The correlation coefficient was used to find the relationship between the effects of mathematics anxiety and mathematics performance among secondary school students in the Arusha City Council. To measure the effects of mathematics anxiety on mathematics performance, a multiple regression analysis was applied. A significance level of 0.05 was used to test the hypothesis formulated. To test the validity of the research instrument, a researcher consulted several research experts in the formulation of questionnaires to check and give comments on how to improve it. The researcher was very careful while incorporating the given advice. Cronbach's alpha coefficients were used to test the reliability of each item in a questionnaire. Ten respondents were piloted and asked to fill out the questionnaires. Then, Cronbach's alpha coefficient was computed, and the result showed a coefficient of 0.82, which is found to be reliable (Bryman and Bell 2012).

4.0.Results and Discussion

The study aimed to assess the effect of mathematics anxiety on mathematics performance among secondary school students in Tanzania. A case of Arusha. In the first place, the study tried to find the effects of mathematics anxiety by generating ten statements where each respondent chose one answer based on the five-point Likert scale. Based on the mean values, the five-point scale ranges are as follows: mean scores of less than 1.5 represents Strongly Disagreed; mean scores of 1.5 but less than 2.5 represents Disagreed; mean scores of 2.5 but less than 3.5 represents Neutral; mean scores of 3.5 but less than 4.5 represents Agreed; mean scores of 4.5 to 5 represents Strongly agreed. The findings are explained below.

The Effects of Mathematics Anxiety on Mathematics Performance Among Secondary School Students in Tanzania

Table 2: Effects of Mathematics Anxiety

S/N	Effect of Mathematics Anxiety	SD %	D %	N %	A %	SA %	Mean
1	My fear of math contributes to my poor Performance	16.7	10.4	2.8	29.8	40.7	3.68
2	My friends bully me due to my fear of Mathematics	38.7	25.2	7.4	16	12.7	2.39
3	I always get sleep during math class	38.7	20.1	4.3	19.6	17.3	2.57
4	I prefer reading other subjects during math Class	36.9	22.9	5.9	19.6	14.8	2.63
5	I opt an art combination due to my	25.	12	5.6	24.	32.	3.26

	poor	7			4	3	
6	I must attend a remedial mathematics class to reinforce my understanding	18.6	14.5	5.3	27.7	33.8	3.44
7	I hate and avoid my math teacher	26.3	22.4	3.8	17.6	29.8	3.02
8	I can't choose a science combination because of my poor grades in mathematics	26.2	10.9	3.8	27.2	31.8	3.27
9	My school attendance is poor because of my fear of mathematics	55.2	17.8	3.1	10.7	13.2	2.09
10	I lose confidence in front of other students due to my fear of mathematics.	30	16.8	3.8	17.8	31.6	3.04
11	**Composite Mean**	**2.93**					

Source: Researcher (2022)

4.1. Effects of Mathematics Anxiety

In summary, the study found that respondents were generally undecided; that is, neither agreed nor disagreed that anxiety has effects on mathematics performance among secondary school students in Tanzania, as revealed by the composite mean of 2.93, which stands for neutral. Specifically, the results revealed that 'fear of mathematics contributes to poor performance was the only statement that respondents agreed upon, with a mean average of 3.68. Respondents were neutral in statements such as 'attending remedial class to reinforce understanding' had a 3.44 mean, and 'can't choose science combination because of poor grades in mathematics' had a 3.27 mean average. Also, 'I opt for art combination due to my poor mathematics performance' and 'I lose confidence in front of my fellow students due to fear of mathematics' had a mean average of 3.26 and 3.04, respectively. Other statements that respondents were neutral about are 'I hate and avoid my mathematics teacher' had a mean of 3.02, 'I prefer reading other subjects during mathematics class' had a mean of 2.63 and 'I always get sleep during mathematics class' had a mean of 2.57. The study also had respondents who disagreed on the effects of mathematics anxiety on performance with the following statements: 'my friends bully me due to my fear of mathematics and 'my school attendance is poor because of my fear of mathematics' had 2.39 and 2.09 mean respectively.

4.1.1 Fear of Mathematics Contributes to Poor Performance

The study inquired on whether fear of mathematics as a subject contributes to poor performance of the same. In this aspect, 16.3% of respondents strongly disagreed with the statement that fear of mathematics contributes to poor performance; 10.4% disagreed with the statement, while 2.8% of respondents were neutral. On the other side, 29.8% of respondents agreed with the statement that fear of mathematics contributes to poor performance, while 40.7% strongly agreed with the statement. The above findings were complimented by the mean of 3.68, which implies respondents agreed that fear of mathematics contributes to poor performance. According to Nathan and Jackob (2020), mathematics anxiety hinders students' positive thinking about mathematics resulting in low self-esteem, disappointment, and academic failure. Researchers have found a correlation between mathematics anxiety and test anxiety, meaning that poor mathematics performance is also contributed by mathematics anxiety experienced by students during an examination. This happens when students fail to prepare well for the examination, resulting in developing fear and end up failing the exam or test (Bentil, 2020).

4.1.2 Bullying Due to Fear of Mathematics

The study examined whether respondents are bullied by their peers because of their fear of mathematics. In this aspect, the study found that 38.7% of respondents strongly disagreed, 25.2% of respondents disagreed, and 7.4% of respondents were neutral. Furthermore, 16% of respondents agreed with the statement that they are bullied due to their fear of mathematics, and 12.7% of respondents strongly agreed with the above statement. The study noted a mean of 2.39, which imply that respondents generally disagreed with the statement that they are bullied by their fellows because of their fear of mathematics. In this study, students are not bullied by their fellow students in classes, hence have the potential for success. However, if bullying takes place in the classroom, student failure is possible, as noted by Butnaru (2021), who conducted a study on bullying in schools. It was found that bullying leads to victimisation, and victimisation leads to poor performance in mathematics. Another study conducted by Saher et al. (2017) in Turkey revealed that bullying students, whether at home or school, eliminate their confidence in mathematics hence leading to poor performance.

4.1.3 Sleeping in Mathematics Class

The study probed if respondents were sleeping during math class as a subject contributes to poor performance of the same. In this aspect, 38.7% of respondents strongly disagreed with the statement that they always get sleep during math class; 20.1% disagreed with the statement, while 4.3% of respondents were neutral. On the other side, 19.6% of respondents agreed with the statement they always get sleep during math class, while 17.3% strongly agreed with the statement. The above findings were complimented by the mean of 2.57, which imply respondents were neutral about the statement that they always get sleep during math class. The concept of sleeping during class sessions has been noted to have an impact on students' performance. A study conducted in the Philippines by Sygaco (2020) asserted that when the level of resting among students is interrupted leads to fatigue and tiresome sessions hence sleeping in classes as students need an average of 8 to 10 hours for resting. In this study, it was noted that sleeping happened to STEM subjects which are Science, Technology, Engineering and Mathematics hence poor performance among students in these subjects. When this meets with a lack of interest in mathematics subject, sleeping in classes is a thing to possibly happens. Also, Hershner (2020) supports the need for enough sleep among students as it helps the stable mental well-being of students and hence can lead to performance.

4.1.4 Reading other Subjects during Mathematics Class.

The study inquired whether respondents preferred reading other subjects during math class. In this aspect, the study found that 36.9% of respondents strongly disagreed, 22.9% of respondents disagreed, and 5.9% of respondents were neutral. Furthermore, 19.6% of respondents agreed with the statement that they prefer reading other subjects during math class and 14.8% of respondents strongly agreed with the above statement. The study noted a mean of 2.63, which imply that respondents generally were neutral with the statement that they prefer reading another subject during math class. Although respondents were neutral on this matter, however, this suggests a possibility for the existence of students' lack of interest in mathematics. A lack of interest in mathematics subject may propel a student to engage in other activities hence losing concentration in the subject. This assertion is supported by Irfan Agus (2021), who found that a lack of concentration and interest in learning mathematics contribute to students' poor performance. In another study by Lalu Puji (2021), the same issue of lack of interest and concentration among students has been highlighted as causative of mathematics failure among students. In this study, students opinioned that mathematics is a difficult subject and that it has complex formulas and logic, which make comprehension very challenging.

4.15. Opting for Art Combination due to Poor Performance in Mathematics

The study probe whether respondents opt for an art combination due to poor performance in mathematics. In this aspect, 25.7% of respondents strongly disagreed with the statement that they opt the art combination due to poor performance in mathematics; 12% disagreed with the statement, while 5.6% of respondents were neutral. On the other side, 24.4% of respondents agreed with the statement that they opt for art combination due to poor performance in mathematics, while 32.3% strongly agreed with the statement. The above findings were complimented by the mean of 3.26, which imply respondents were neutral about the statement that they

opt art combination due to poor performance in mathematics. Despite the composite mean, respondents who agreed and strongly agreed that they opted for the art combination due to poor performance in mathematics were above 50%, which implies failure in mathematics is a hindrance to science combinations. One of the effects of mathematics anxiety is avoidance of mathematics-related activities, including mathematics courses such as STEM. According to the study by Mason & McFeetors (2007), students tend to opt for science and mathematics courses based on prior achievement and socioeconomic status. Students also prefer art combinations to avoid struggling to study science courses; this is due to a perception that mathematics and science subject are difficult subjects. Bittman (2008) found that fear of failure may sometimes force students to choose art combinations. Students need mentors' guidance in case of carrier selection.

4.1.6 Attending Mathematics Remedial Classes to Reinforce Understanding

The study examined whether respondents must attend remedial mathematics classes to reinforce their understanding. The study found that 18.6% of respondents strongly disagreed, 14.5% of respondents disagreed, and 5.3% of respondents were neutral. Furthermore, 27.7% of respondents agreed with the statement that they must attend remedial mathematics classes to reinforce their understanding, and 33.8% of respondents strongly agreed with the above statement. The study noted a mean of 3.44, which imply that respondents were generally neutral with the statement that they must attend remedial mathematics class to reinforce their understanding. Due to the nature of the subject and the different levels of understanding of students, there is a need for extra time for teaching and learning mathematics after normal class hours. This is supported by the study of Liu (2018) that, to improve students understanding towards a certain subject, then strategies like increasing instructional time should be employed in schools. It is further believed that remedial programs are there to provide additional instructions on subjects like mathematics to improve their performance. According to Bessho (2019), who evaluated remedial education in elementary school for students with low performance in mathematics, found that there is a need to improve students' performance by giving them extra learning and practising hours.

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4.1.7 Hate and Avoidance of Mathematics Teacher

The study probe whether respondents hate and avoid their mathematics teacher. The study found that 22.4% of respondents strongly disagreed, 26.3% of respondents disagreed, and 3.8% of respondents were neutral. Furthermore, 17.6% of respondents agreed with the statement that they hate and avoid their mathematics teacher, and 29.8% of respondents strongly agreed with the above statement. The study noted a mean of 3.02, which imply that respondents were generally neutral with the statement that they hate and avoid their mathematics teacher. According to Magnate (2022), students with a high level of mathematics anxiety tend to avoid their mathematics teacher while in mathematics class as they are afraid to be asked a question and give a wrong answer and be scolded. They mostly sit at the back of the class. From the researcher's experiences in the field of teaching mathematics, it had been noticed that there are students who are afraid to enter the class because of fear of their teacher in mathematics or hesitant to participate because they are afraid to give the wrong answer and get scolded by their teacher or are afraid to enter the class because they are not prepared for the lesson, or they have no assignment or any activity assigned by the teacher.

4.1.8 Failure to Choose Science Combination due to Poor Grades in Mathematics

The study inquired whether respondents couldn't choose the science combination because of poor grades in mathematics. In this aspect, the study found that 26.2% of respondents strongly disagreed, 10.9% of respondents disagreed, and 3.8% of respondents were neutral. Furthermore, 27.2% of respondents agreed with the statement that they couldn't choose a science combination because of poor grades in mathematics, and 31.8% of respondents strongly agreed with the above statement. The study noted a mean of 3.27, which imply that respondents generally were neutral with the statement that they couldn't choose a science combination because of poor grades in mathematics. According to Gafoor & Kurukkan (2015), mathematics anxiety has forced many students to avoid carrier related to mathematics. For example, the study by Scarpello (2007) revealed that 75% of Americans have stopped the study of Mathematics and avoid many careers related to mathematics. Students with mathematics anxiety develop fear and hate towards mathematics resulting in failure. In Tanzania, students who scored F in mathematics in the form four national examination cannot be selected to study careers like engineering, clinical medicine, pharmacy, accountant, and finance, to mention a few.

4.1.8 Poor School Attendance due to Fear of Mathematics.

The study probe whether respondents' school attendance is poor because of fear of mathematics. In this aspect, 55.2% of respondents strongly disagreed with the statement that their school attendance is poor due to fear of mathematics; 17.8% disagreed with the statement, while 3.1% of respondents were neutral. On the other side, 10.7% of respondents agreed with the statement that their school attendance is poor due to fear of mathematics, while 13.2% strongly agreed with the statement. The above findings were complimented by the mean of 2.09, which imply respondents strongly disagree about the statement that their school attendance is poor due to fear of mathematics. The findings of this study have shown that fear towards mathematics does not affect students' school attendance. However, studies by other researchers have shown that students are afraid to enter the classroom due to different factors, such as fear of mathematics teachers and fear be to asked questions in class (Magnate, 2022).

4.1.10 Loose Confidence in front of other Students due to Fear of Mathematics

The study examined whether respondents lose confidence in front of other students due to fear of mathematics. The study found that 30% of respondents strongly disagreed, 16.8% of respondents disagreed, and 3.8% of respondents were neutral. Furthermore, 17.8% of respondents agreed with the statement that they lose confidence in front of other students due to fear of mathematics, and 31.6% of respondents strongly agreed with the above statement. The study noted a mean of 3.04, which imply that respondents were generally neutral with the statement that they lose confidence in front of other students due to fear of mathematics. It can be concluded that there are some elements of loss of confidence among respondents since almost half of them have agreed to have a loss of confidence in front of others due to fear of mathematics. The study of Arem (2009) has revealed that mathematics anxiety can be caused by a psychological factor such as a negative attitude towards mathematics, resulting in a lack of confidence and low self -esteems among students. Lack of confidence is a big challenge among students with mathematics anxiety (Dodd, 1999)

4.2 Correlation and Multiple Regression Analysis

The effects of mathematics anxiety on secondary school performance were tested by using regression analysis. The 0.05 level of significance was used with the following hypothesis.

H0 - Mathematics anxiety does not have a significant effect on secondary school students' mathematics performance.

H1 - Mathematics anxiety has a significant effect on secondary school students' mathematics performance.

Model Summary:

Model	R	r^2	Adjusted r^2	Standard error of estimate
1	.304	.093	.090	1.181

The model summary above shows the correlation coefficient (r) =0.304. The correlation coefficient (r) range is -1$\leq r \leq$ 1. The relationship between variables may be positive if the correlation coefficient is $0 < r \leq$ 1 and negative if $-1 \leq r < 0$. When $r = 1$, there is a perfect positive correlation, and when $r = -1$ indicates a perfect negative correlation, but when $r = 0$, it means there is no relationship between variables. The study result, as shown in the above table, reveals a moderate positive correlation between the effects of mathematics anxiety and students' performance (Kothari 2004).

Regression Coefficient on the Effects of Mathematics Anxiety and Students Performance

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig
	B	Std. error	Beta		
Constant	2.698	.225		11.994	0.000

Math Anxiety	.468	.074	.304*	6.320	0.000

Correlation is significant at p< 0.05 (2-tailed)

Source (Field Data, 2022)

The significance of the effects of mathematics anxiety on mathematics performance among secondary school students is explained in the above table. The null hypothesis may be rejected if the level of significance is less than 0.05, and it can be accepted if the level of significance is above 0.05. The above table shows that the effects of mathematics anxiety on mathematics performance are statistically significant at (P-Value = 0.000, 2- tailed), meaning that the null hypothesis is rejected, and the alternative hypothesis is accepted. By accepting the alternative hypothesis, the study confirms that there is a significant effect of mathematics anxiety on mathematics performance among secondary school students. The regression equation is used to show the effect of an independent variable on the dependent variable. In the above table, a regression equation which shows the effects of mathematics anxiety on mathematics performance is $y = 2.698 + 0.468x$. This equation means that when other factors remain constant, then mathematics anxiety affects mathematics performance by 46.6%.

5. Conclusion

According to the findings of this study, it is concluded that mathematics anxiety has a significant effect towards students' mathematics performance among selected secondary schools in Arusha City Council. Therefore, there is a need to find the causes of mathematics anxiety among students, and ways of reducing it should be an area for further study.

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