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Secondary School Students' Mathematics Anxiety: A Zimbabwean Perspective

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Abstract

This study employed a mixed-methods technique to examine the spectrum of mathematics anxiety levels felt and expressed by Zimbabwean students studying Ordinary level mathematics. Ninety-one pupils from forms 3 and 4 (N = 91) made up the convenient sample; of them, 41 were male and 50 were female. The instrument used was the Hopko-adapted amalgamated mathematics anxiety scale (aMAS) (2003). While focus group conversations were audio recorded and transcribed to explore in-depth, social settings and learning environments that cause anxiety, the quantitative data was analysed using SPSS, version 23.0. The key categories were then thematically classified and analysed with quantitative information. To test a hypothesis based on the data, an independent samples t-test was run to see whether males and females' anxiety levels differed by mean. The results showed that the participants experienced significant mathematics anxiety, and many situations—including parental and social pressure, instructional methods, and learning environments—reinforce math fear. Findings also show that, society exerts significant pressure on learners due to high expectations of success in mathematics. Additionally, some teachers were viewed as fuelling the anxiety through their repertoire and that classroom environments may unintentionally cause discomfort to mathematically challenge peers. Interesting suggestions were made by respondents regarding how to help people with math anxiety. The study offers a compelling case for its relevance to teacher education, research, and instructional practice. The study also recommends conducting comparative studies as one method of comprehending the issue.

Keywords*: Cognitive achievement, Mathematics-anxiety, Teaching-learning, Gender issues, Social phenomena.*

Introduction

The general problem of interest is the issue of Mathematics Anxiety (MA) in the secondary school context in Zimbabwe. Math is a necessary skill not only for academic success but also for effective everyday living. Hembree and Ashcraft, posited in [1, 2] that when confronted with numerical challenges, however, a considerable section of the population feels anxiety and trepidation. This negative emotional reaction to math is formally called "Mathematics anxiety" (MA), and it has also been shown by Carey et al in [3] to interfere with mathematics performance as well as lead to people avoiding it altogether. Mathematics anxiety is defined by Cemen in [4] as a feeling of unease experienced by students when asked to execute mathematical tasks. Further, Suinn and Winston, in [5] added that when dealing with mathematical assignments, the salient manifestations are a feeling of discomfort, which includes hate of the subject, worry, and fear, as well as specific behavioural manifestations such as tension, impatience, despair, helplessness, and mental disorganisation.

Also, Ashcraft, Dew et al and Zakaria in [2, 6, 7] confirm that when confronted with mathematics stimuli, individuals experience

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elevated physiological sensitivity, negative cognitions and anxiety in Mathematics is a psychological aspect of learning that educators must recognise.

Literature Review

Mathematics anxiety has long been thought of and assessed as a multidimensional construct by researchers such as Liebert and Morris and Wigfield and Meece in [8 & 9]. Emotionality, which is the physiological aspect of anxiety (e.g., palms sweating, heart racing), and worry, which is the cognitive aspect of anxiety (e.g., worried thoughts, racing heart), are two ways to think about it.

On the other hand, Alzahrani in [10] opines that students' social circumstances, cognitive functioning, and academic ability vary, all of which can be linked to varied degrees of Mathematics anxiety. Further, they assert that social variables, such as parental and familial support, could be an important factor influencing one's perception of mathematics and, as a result, associated anxiety when studying the subject, particularly in households with low socioeconomic status and that students with low self-esteem and a lack of drive to learn mathematics may be more concerned about their grades. In [11] Mutodi and Ngirande, also postulated that many pupils who experience MA never previously built strong foundations in basic mathematics. Because mathematics is an accumulative subject, complex concepts are built on a base of simpler concepts, and a student who lacks a sound arithmetic foundation will struggle to acquire higher-level math.

Another important consideration by Ruff and Boes in [12], is that learning and retention of learned mathematics concepts, cognitive functioning ability, combined with a lack of understanding of some concepts when first taught, as a result of personal learning difficulties or a lack of ability to focus, particularly for younger students, can contribute to one's anxiety when it comes to the learning of mathematics.

Elsewhere, Hembree, Rollinson in [1, 13] have established that highly math-anxious students tend to participate less in lessons and perceive their mathematical skills as sub-standard and are less likely to pursue math-related courses and that MA results in reduced cognitive reflection.

Moreover, Arem in [14] confirms that MA stems from unpleasant past experiences with mathematics, which agrees partly with Denhere in [15] in as far as past experiences are concerned. Arem, further asserts in [14] that pupils who have a high level of mathematics anxiety have negative thoughts about their abilities and will have a difficult time working with numbers and mathematical concepts in problem-solving situations. This is in agreement with Zakaria in [7], who concluded that pupils who perform well in mathematics have a favourable attitude toward the subject.

Other factors include cognitive predisposition as posited by Lyons and Beilock in [16], Young and Wun in [17], sociocultural gender stereotypes and negative self-talk, social pressure, and the expectation to attain great achievements, the drive to excel, myths about math study, and negative self-perception.

One of the most difficult aspects of gauging Mathematics anxiety is the impact that society has on pupils' perceptions of Mathematics. In a study in [18] which examined the association between Mathematics anxiety and social desirability, Zettle and Houghton, discovered that college-age males are less likely than females to report emotions of anxiety regarding mathematics because men believe it is socially unacceptable for men to have such feelings.

Others have found that Mathematics anxiety is a strong predictor of mathematics performance in both male and female pupils e.g., Kytala and Bjorn in [19] while females exhibit more Mathematics anxiety than males, according to Khatoon and Mahmoud in [20] and have proffered suggestions to motivate and encourage female pupils to learn mathematics by focusing on changing the classroom environment and

ecology. Further, female students are frequently characterised as shy, which can hinder their capacity to learn. Khatoon and Mahmoud in [20] ascertain that male students are more active in a wider range of social activities than female students. The data on gender disparities in MA varies with culture, age group, and study. Females (including adults and children) have greater MA than males, according to the majority of studies. For example, in the United States, Hembree in [1], Dove, Montague and Hunt, [21] in the United Kingdom, Spain, Núñez-Peña et al, in [22], and Poland, Cipora et al in [23].

In contrast, in [11], Mutodi and Ngirande, explored students' Mathematics anxiety levels at a selected tertiary institution in South Africa, female students were found to have a higher incidence of Mathematics anxiety somehow which confirmed previous findings by Cipora et al in [23], such differences (i.e., women revealing higher levels than men) have been reported. In another study in Qatar, (a culturally different environment) Zahrani in [7] found that there were no statistically significant differences between male and female students' Mathematics anxiety in contradiction with the findings of [20] in Khatoon and Mahmood.

Moreover, according to Furny and Duffy in [24] poor test scores, inability (or desire) to finish tough assignments, negative parental attitudes, and even the mathematics teacher can all contribute to math anxiety. Teachers and parents who are terrified of mathematics pass this fear on to their children and students.

Parental influence, according to Dove et al, Maloney and Haimowvitz and Dweck in [21, 25, 26], may mediate the development of arithmetic anxiety and have a major impact on children's performance. These include parental worries or insecurity about Mathematics, which can lead to unfavourable bias in children and the formation of preconceived notions about math as a difficult learning area. Also, high or unrealistic parental expectations of their children's mathematics talents or achievements might impact feelings of Mathematics anxiety and dread of failure.

Meanwhile, a student's impression of mathematics may be influenced by the teaching methods utilised and the teacher's personality. Academic elements such as the usage of traditional teaching approaches, as well as teachers who have inherent fears with teaching and/or the associated presentation of a particular topic, may influence students' anxiety when learning mathematics concepts.

In addition, teachers may be perceived as unwilling to provide extra support to students who require it and may be viewed as uncaring. When his/her students do not grasp the issues, the teacher may become enraged or upset as well as having unrealistic expectations for his/her students or an inflexible repertoire.

It is also a strongly held view, e.g., Furny and Duffy in [24], that students may become discouraged from learning mathematics if they are forced to go through the textbook question by question. Giving pupils written work every day, emphasising that there is only one correct way to solve a problem, and assigning mathematical problems as a punishment for misconduct can all make children detest math.

However, it is also widely expected that teachers can play a significant role in recognising mathematics anxiety in their students early in their education and adopt strategies to help them overcome their fears as suggested in [7] by Zakaria. Some experts also believe that bad classroom experiences are enablers in the development of an arithmetic phobia. Dove et al in [21] suggest that this can involve Mathematics being taught in a rigorous, non-interactive, or rote manner without a complete unpacking of the concepts and procedural knowledge, or an over-reliance on exams to assess math learning and as well as teacher attitudes. Meanwhile, Maloney and Haimowvitz and Clack, in [25, 27] indicate that a person's ability to use working memory is significantly reduced when they are under stress when performing math, which inhibits them

from coming up with the answers to questions they could normally think of.

There have been some suggestions on how to help pupils overcome mathematics anxiety. These include amongst others, pupils assessing their learning without their friends knowing their score, of which anonymous online tests and exercises can be assigned on appropriate online learning management systems (LMS) if such conditions are existent. Further, Marshall et al in [28] stated that pupils can have access to core learning materials ahead of time and use contact time to focus on processing and applying what they've learned i.e., the flipped learning model. These suggestions may not be a one size fits all remedy given the variety of circumstances and contexts of learning environments in Zimbabwe.

In Zimbabwe there are currently not many significant studies on mathematical anxiety and of these, the salient one was that carried out by Mutodi and Ngirande in [11]. The study, which focused on examination or assessment anxiety, was conducted in four secondary schools.

The results indicated that the majority of students (90 percent) suffered from mild to severe anxiety, sadness, and stress. Females were found to be more stressed during examination periods than males.

In a related study, Denhere in [15], explored the possible causes of mathematics anxiety in Zimbabwe, albeit on a small scale, as identified by form three students. The general conclusions included:

'Mathematisation of the curriculum; negative traditional beliefs/philosophies; defective genetic make-up; embarrassing mathematical experiences; eclecticism and hostile learning environments among others.

Interestingly, Mandinda and Mashingaidze in [29] studied the approaches to enhancing female involvement in Mathematics at advanced level (A level) in Zimbabwe schools in terms of the constraints to female participation in mathematics. Mathematics anxiety was found to be a crucial factor in determining their pursuance of Science, Technology, Engineering and Mathematics (STEM), courses post-secondary. This confirms, amongst other assertions that MA has crucial implications for the posterior development of students' attitudes, as apparently, it is fairly stable over longer periods, as stated by Primi et al in [30].

Students throughout the world experience Mathematics anxiety regularly. According to Alzahrani in [10], students are unable to pursue their studies in mathematics and associated science disciplines at the postsecondary level because of the high levels of anxiety they encounter in classrooms.

Although these studies may well have had good intentions, they did not report students' perspectives on the triggers of MA and how in their words, these triggers could be ameliorated. Another aspect is that most of the research has been done in European contexts and has largely been quantitative without the inclusion of participants' perspectives to give more context to this issue. This study hoped to add to the body of knowledge in the Zimbabwean context, hence it is important to recognise, debunk, and lessen the anxieties associated with the teaching and learning of Mathematics in Zimbabwean classrooms if we want to increase the number of students pursuing STEM fields at the secondary and tertiary levels. The results could also be used to identify and minimise the practices that reinforce Mathematics anxiety and involve all stakeholders in an ongoing conversation that should have a positive effect on the teaching and learning of mathematics. This may help create sensitive and approachable learning activities and materials for curriculum materials developers and teacher educators.

Research Questions

The study was guided by the following research questions:

1. What are the levels of prevalence of Mathematics anxiety in adolescent students in selected Zimbabwean schools?

2. What situations trigger anxiety in Mathematics teaching and learning environments in adolescents?
3. How can students be assisted in mitigating the effects of Mathematics anxiety?
4. Is there a statistically significant relationship between Mathematics anxiety and gender in adolescent students?

Participants

The participants were a convenient sample of ninety-one students, from three urban schools in Zimbabwe. The first year of the two-year Ordinary level program is Form 3, whereas Form 4 is the second and final year. After receiving grades of C to A in their external exams, students would then continue to study A-level subjects of their choosing. To access mathematics, the participants use English as a second language.

Methods

A mixed techniques approach was used and according to Taylor and Fraser in [31], this approach enables data triangulation, which is essential for assuring research validity. A modified informed consent form World Health Organisation (WHO) in [32], was given to pupils for parental permission, and the researcher obtained approval from the relevant authorities, including the Ministry of Education. To maintain their anonymity, the students who took the survey did not indicate their names or form classes. The research employed an adapted mathematical anxiety scale (aMAS), developed by Hopko and in [20, 33]. The aMAS contains 13 statements that describe scenarios when high school pupils are exposed to mathematics. Students were asked to rate their level of anxiety in several scenarios on a 5-point Likert scale, with "strongly disagree" is the least worried and "strongly agree" being the most nervous. Three major constructs—general anxiety, cognitive/learning anxiety, and assessment anxiety—have been separated out for the purposes of this study's consideration of mathematics anxiety.

To determine the range of mathematical anxiety levels among students and the association between mathematics anxiety levels and their gender, an independent samples t-test was conducted. Using SPSS software, descriptive and inferential analyses were carried out. The last step involved a focus group interview in which willing participants were asked about their experiences with MA in classroom settings.

The preliminary scale was readability tested with a different set of students, construct validity was verified by knowledgeable colleagues in the mathematics department, and tweaks were made to make the questions more succinct and straightforward. The degree to which all test items assess the same attribute is shown by Cronbach's alpha coefficient, which according to Huysamen in [34], measures internal consistency. The scale's Cronbach coefficient, which was 0.783, was deemed appropriate.

Findings and Discussion

The research participants responded to the survey with a good response rate. A total of 91 completed questionnaires were in hand after the data-gathering period. An 83 percent response rate was achieved given that the study's sample size was 110.

Table 1. Demographic Variables of Participants

Variable	Frequency	%
Gender	Male 41	45.1
	Female 50	54.9
Form	Form 3 53	58.2
	Form 4 38	41.8
Home Language	Isindebele 71	78.0
	Shona 19	20.9
	Other 1	1.1

The Table 1 that the sample comprised more females than males. The participants spoke a variety of native tongues. These form part of the 16 official languages spoken in Zimbabwe. Only one pupil had a distinct native tongue. It is important to stress that from a linguistic standpoint, all participants approach mathematics from the same position as English as a second language learners.

The first research question's aim was to examine the range of mathematics anxiety levels felt and reported by students in Zimbabwe who were studying high school Mathematics. The fact that students displayed a range of worries at various levels suggested that there was a broad sense of unease or general anxiety among the participants.

Table 2. Use of Mathematics in Higher Education

I believe I will handle Maths in my career					
Response		**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**SA**	28	30.8	31.5	31.5
	A	40	44.0	44.9	76.4
	DA	6	6.6	6.7	83.1
	SD	3	3.3	3.4	86.5
	Neutral	12	13.2	13.5	100.0

Table 2 shows that most participants believed they might succeed in math in higher education, although a minority (10.0 %) voiced grave concerns about continuing with the subject.

Table 3. Mathematics Preference in Higher Education

I prefer Maths in Higher Studies					
Response		**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**SA**	32	35.2	35.2	35.2
	AG	34	37.4	37.4	72.5
	DA	12	13.2	13.2	85.7
	SD	4	4.4	4.4	90.1
	N	9	9.9	9.9	100.0

Table 3 interestingly shows that, more participants claimed they intended to use math in their future schooling, while just 17.8% expressed scepticism about their intentions.

This shows that failure is a primary threat in Mathematics Anxiety and suggests that expectations of failure are immediately and automatically activated in highly mathematics-anxious individuals. This may also be a sign of the enormous societal pressure placed on math achievement as a prerequisite for admission to STEM courses and individuals who did not envision a future with Mathematics felt gloomy.

Table 4. Future Prospects of Engaging with Mathematics

I would like my future career to involve maths					
Response		**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**SA**	11	12.1	12.1	12.1
	AG	26	28.6	28.6	40.7
	DA	27	29.7	29.7	70.3
	SD	9	9.9	9.9	80.2
	N	18	19.8	19.8	100.0
	Total	91	100.0	100.0	

Additionally, more students indicated that they would be open to employing Mathematics in their careers, whereas 17.6% strongly opposed it. This suggests that there is a critical mass of participants who might be affected by greater levels of worry. Further analyses showed that, 42 students (46.20%) indicated that they were afraid to ask questions during mathematics lessons, which is an indicator of cognitive/learning anxiety in other participants additionally, 17 students (19, 30%) indicated they did not like their mathematics classes at all. Many reasons can be attributed to such an attitude, for example, bad classroom experiences amongst many others as posited by Dove et al in [21].

Table 5. Feelings about Mathematics Homework and Support

Working on Math's homework stresses me out					
Response		**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**SA**	18	19.8	19.8	19.8
	AG	17	18.7	18.7	38.5
	DA	22	24.2	24.2	62.6
	SD	18	19.8	19.8	82.4
	N	16	17.6	17.6	100.0

Table 5 shows that a good proportion of students reported feeling upset and unassisted in extension work i.e., homework while a critical mass of 16 (17, 6%) were unconcerned. This suggests that teachers must come up with creative ways to help students outside of the classroom when they need it.

The flipped classroom is an ideal solution to enhance interaction if technology allows it. In the flipped classroom model, learners are assigned tasks that they perform outside school time, usually online and then revision is done during lessons mainly focussing on challenges faced while working on the concepts embedded in the task.

Table 6. Assessment Anxiety

I get tense when preparing for a mathematics test					
Response		**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**SA**	17	18.7	18.9	18.9
	AG	32	35.2	35.6	54.4
	DA	22	24.2	24.4	78.9
	SD	10	11.0	11.1	90.0
	N	9	9.9	10.0	100.0

Furthermore, as shown in Table 2.5, there was a significant amount of assessment anxiety, with as many as 40% of the students worrying about their exam outcomes and only 20% not caring. 49 people (54, 40%) expressed concern about their academic performance as they said they were nervous before a mathematics test. This supports the common experiences of worry among participants over their ability to succeed in Mathematics.

In contrast to the 38 participants (42%) who found it challenging to complete the mathematics exercises, only 37.7% of participants felt at ease and 47.80% lacked the confidence to ask questions in class. On the other hand, 62 individuals (68%) expressed fear of giving a false response in front of the class. This is further buttressed by the fact that when the teacher explained, 29 (29, 7%) pupils indicated

they felt under pressure, whereas 50 (55, 00%) disagreed.

Teachers were accused of exhibiting unintentional eclectism which invariably leads to more confusion with students. This agrees with the findings by Denhere in [15] and Mutodi and Ngirande in [10]. Moreover, these results are in line in principle with the findings of Hembree, Zakaria and Arem in [1, 7, 14], who all agreed that students who experience high levels of Mathematics anxiety have low opinions of their talents.

These findings highlight the value of creating a respectful, pain-free, and tolerant learning environment. Students must be encouraged by their teachers to support one another and refrain from passing unsolicited judgment on one another throughout the lessons.

To make sense of the quantitative results, focus groups interviews were held as part of the study, and willing participants gave their opinions about the prevalence of MA, anxiety-provoking scenarios in the classroom, and ways that, in their opinion, may be used to lessen the detrimental impact of Mathematics anxiety.

On a scale of 1 to 10, with 10 representing the most uneasy, students were asked to rate their feelings of anxiety. The findings indicated that 40% of the individuals had different types of anxiety on varying measures that inclined toward uneasiness. This points to an observation by Dowker and Sheridan in [35] that the incidence of Mathematics anxiety will vary on the sample's makeup and the definition used, but even the lower figures indicate that it is a substantial issue for many.

The second research question sought to ascertain what situations trigger anxiety in mathematics teaching and learning environments in adolescents? Students who were asked to describe the nature of their fears expressed anxiety before tests which appeared in feelings of dissatisfaction, "we do not know what will be on the test," shivering, sweaty palms, feeling terrified, forgetfulness, and worry about passing the test, afterward.

Participants who were asked to name anxiety triggers mentioned a variety of situations, including pressure from parents (27, 0%), teacher practices and expectations, as well as peer pressure in learning environments- being laughed at when one makes mistakes, being mocked, and feeling isolated to the point where they used "keeping up the appearances even if one does not understand", as a coping mechanism.

Some teachers reportedly began lessons without outlining the lesson's goals repeatedly, sometimes failed to simplify the material, yet held pupils to a high standard, and covered the material rapidly (this point was applauded by many).

Teachers have occasionally been seen to be unhelpful when asked for assistance, prompting the question, "how can you not understand when others do?' This expression was mentioned frequently by the participants. Students believed that math instructors overlooked student differences in their instruction as they seemed to be preoccupied with syllabus completion.

The settings in the classroom can be created to support a growth mind-set and lessen the stress felt by mathematics students. Students' overall mind-sets can be altered by implementing techniques that encourage them to focus on mastery rather than getting all the answers correct and to view failure as a chance to learn.

Further, teachers must also consider using a variety of techniques that accommodate the individual peculiarities of each student and take their time when covering material. Simply put, teaching should be differentiated, i.e., address individual differences and this involves careful planning by the teacher as the facilitator.

The use of active learning activities that bring 'fun' to the subject is imperative. This could be in the form of graphic organisers, think-pair-share, traffic lights, exit passes, hot chair strategies, and group work among many within the Assessment for Learning (AFL) paradigm. Assessment of learning, (AOL), which is

essentially summative assessment, should then be viewed as an opportunity to assess progress by both teacher and student in view of previously set targets and addressing the limitations identified in the assessment.

One strategy could be promoting discussion and allowing for the exchange of ideas as Clark in [27], adds to this idea by confirming that a crucial step in ensuring that student groups offer each other no misconceptions is debriefing, i.e., teacher interrogation, to assess the smaller group's thinking. Additionally, students stated, educators need to create a safe learning environment where respect is valued. When teachers make fun of students, when they don't understand the material, when they attain poor test grades and the results are made public or when they demonstrate that they don't understand the concept and are still asked to go to the board, when they don't know the answer when asked, and in other similar situations, peer pressure causes anxiety (afraid of saying wrong answer- peers laughing).

This also confirms the assertion by Clark in [27] that individuals may already know the answers to problems but worry prevents them from accessing that portion of the brain (working memory), making it impossible for them to find a solution at that time. An individual may begin to experience Mathematics anxiety if bad performance leads to more anxiety, which in turn leads to poor performance. This vicious cycle might lead to the conclusion that one is simply not good at arithmetic, and trigger Mathematics anxiety.

In addition, parental influence as discussed in Haimowvitz and Dweck in [26] was singled out as a significant source of pressure where parents desire excellent performance yet is unwilling to provide support, emotionally, physiologically, and financially for their children. The parent's impression of failure is more closely related to the child's thinking than it is to that of the parent. Parents who saw failure as a crippling event in their child's academic career led to their children believing intellect was fixed.

The third research question sought to identify how students felt they could be assisted to overcome MA. Participants said they would value it if parents helped them become more self-assured and encouraged them to persevere. Schools would need to assess how parents may be assisted in that regard.

Students knew what they needed to do in order to be proactive when asked what they could do to minimise MA. They stated that they had to efficiently manage their time, pay attention, practice frequently, evaluate themselves, and actively participate in lessons. Subject teachers could help students set smart targets in their journals as well as constantly sharing the success criteria for most if not all learning and assessment activities. Student must know what the content and skills of their assessment(s) will be:

Students added that they needed to follow up on lessons, "keep their eyes on the ball," and ask for help early, before significant exams. This is a positive growth mind-set, as there aren't any individuals who are better suited to learn mathematics; rather, only those who are more open-minded, receptive, and confident in their ability to do so.

Another point mentioned by the students was that, on occasion, it was impractical to ask for help from siblings and parents who might have forgotten the material due to the passage of time. According to Clark as discussed in [25], there is some truth to the claim that, if parents with MA frequently help their children with their homework, the amount of math a student learns over a school year may decrease.

Nonetheless, the participants had valuable counsel for teachers. They implored teachers to design stimulating, contextualised classes, filled with concepts and examples from real life and at the same time, be diagnostic, patient, and encouraging. This supports the research by Mutodi and Ngirande in [11], who posited that traditional methods of teaching mathematics were a major cause of worry for many students.

The fourth research question attempted to determine whether there were significant differences in mean scores between math anxiety levels and gender. An independent-samples t-test was conducted to compare the anxiety level differences in scores for males (M= 16.15, SD = 2.21) and females (M=15.75, SD = 2.19; t (85) = -849, p=0,389, two-tailed). It was concluded that there were no significant differences between gender and the levels of anxiety, p>0.05.

This result contrasts with those of the majority of studies conducted in some European societies, where female students are frequently perceived as shy, hence suffered more from MA, Hembree, Núñez-Peña et al, Cipora et al a Hunt et al in [1 ,22,23, 36]. However, in [11], Mutodi and Ngirande observed that females were more nervous than males in that Zimbabwean context.

Conclusion

To ascertain whether gender and the students' degree of mathematics anxiety were related, the research looked into the range of mathematics anxiety levels experienced and expressed by Zimbabwean pupils studying ordinary-level mathematics. The findings suggest that MA is a learned behaviour that transcends age, culture, and language.

The study concludes that a significant number of Zimbabwean adolescent students experience mathematics anxiety as a result of several circumstances. Students also claim that a range of variables contributes to mathematics fear, including — parents, society, learning settings, and instructional methods. By having high expectations for mathematics performance, parents can unintentionally or intentionally contribute to anxiety reinforcement. Students are under needless pressure, which causes worry.

Additionally, students suggested that teachers could think about including a variety of active learning strategies, differentiate their instruction, and structure lessons following the social constructivism paradigm. The classroom environment can be designed to foster a growth mind-set. Techniques that encourage students to place more on mastery and view failure as an opportunity to learn can change the way they think about learning in general. Finally, the students' level of math anxiety was unrelated to their gender in this sample of students.

Implications and Recommendations for Further Study

The findings of this study have implications for different stakeholders. The control of the learning environment and ecology could be promoted among teachers. Students demand a fun and emotionally secure learning environment. When planning lessons, it's imperative to take a bird's-eye view of all the participants and consider the alignment of the following factors: classroom expectations, learning objectives, success criteria, learning activities and differentiation, materials, assessment, and feedback. For successful outcomes, these should be in alignment.

Furthermore, by having a discussion about the topic and offering school courses on learning issues before parent meetings, schools can address the parental impact on MA. This offers an opportunity for discussion about such educational obstacles as MA.

Teachers could be surveyed to determine how they approach anxiety and gauge their understanding of and awareness of their instruction in larger and comparative studies. The design of relevant pre-service and professional development opportunities would then be based on such findings. Mathematics teacher education could also explore ways of promoting awareness of Mathematics anxiety in the curriculum.

Conflict of Interest Statement

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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