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Impact of Mathematics Anxiety on Secondary School Students' Learning Achievement

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Abstract

Mathematics anxiety is widely recognized as an emotional, rather than a psychological, problem affecting factor influencing students' performance in mathematics It has established significance attention in literature, yet there remains remarkable uncertainty regarding variables involved. This study examines the level of mathematics anxiety and its impact on secondary school students' learning achievement. Using a correlation survey design, data was collected through mathematics achievement test and mathematics anxiety scale with grade 10 students in community schools of surkhet District. The collected data was analyzed using Pearson correlation. The findings reveal that the status of mathematical anxiety to be found moderate level (83.7%). Moreover, there is significant relationship between students' mathematics anxiety and their learning achievement indicating that mathematics anxiety is affecting factor of students' learning achievement. The study offers that school level remedial math anxiety intervention for enhancing learning achievement of secondary school students.

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Introduction

Mathematics takes a central part in the school curriculum. Mathematics is taught in Nepal from the school to university level. The subject is taken as a prerequisite for other courses hence it has been included to the school level curriculum as a compulsory subject. However, the performance of students in mathematics is low and the nationwide standard of education is falling (Education Review Office, 2022). Furthermore, secondary-level mathematics is available for interested students (CDC, 2005). Mathematical skills are essential for success in various job markets. Since mathematics underpins various subject areas

and content, mathematical knowledge is crucial for learning in other disciplines. So, we can say that mathematical skills are the fundamentals for everyday life (Puteh et al., 2018).

Globally, mathematics anxiety is emerging issues in education and educational psychology field, it has clearly demonstrated that the phenomenon commonly referred to as maths anxiety is primarily a consequence of the pedagogical approaches employed in the teaching of mathematics to students, rather than being essentially linked to the inherent difficulty of the subject itself (Samuel & Warner, 2021). Consequently, it becomes imperative to recognize that educators occupy a crucial position in the effort to mitigate the manifestations of maths anxiety within the classroom environment. The onset of maths anxiety can often be traced back to the early childhood developmental stage, where several contributing factors, such as difficulties in numerical and spatial processing abilities play a critical role in mathematic learning (Ramirez et al., 2013). These early signs of anxiety may eventually lead to reduce academic performance, thereby reinforcing and perpetuating the cycle of mathematics anxiety (Maloney, 2016). Furthermore, it is important to recognize that the roots of mathematics anxiety are closely linked to the instructional methodologies employed by mathematics educators, particularly those that adhere to traditional teaching paradigms characterized by direct instruction and an authoritative teacher-student dynamic. This particular approach tends to foster a learning environment in which students passively absorb mathematical techniques and concepts without engaging in critical questioning or active cognitive processing of the material being presented (Cates & Rhymer, 2003; Finlayson, 2014). Additionally, empirical investigations have established a compelling correlation between the presence of maths anxiety and its detrimental impact on students' mathematical achievement (Karimi & Venkatesan, 2009; Maree et al., 2013), which in turn has the potential to diminish students' interest and enthusiasm toward the subject of mathematics itself (Asanjarani & Zarebahramabadi, 2021). This disinterest may further contribute to adverse longitudinal educational product, such as persistently low mathematical success and a conscious avoidance of career trajectories that necessitate substantial engagement with mathematical concepts and skills (Ashcraft & Moore, 2009; Ma, 1999). Moreover, neglecting to report the issue of maths anxiety within the academic context can lead to its spread into the professional sphere, as well as into everyday situations requiring mathematical application. For instance, research has indicated that maths anxiety can significantly hinder nurses' abilities to perform accurate drug calculations (McMullan et al., 2012) and can also complicate individuals' financial planning processes (McKenna & Nickols, 1988). Furthermore, it is important to acknowledge that both mathematics educators and parents may inadvertently transmit their own experiences of maths anxiety to their students and children, thereby underscoring the necessity for the early identification and intervention of maths anxiety as a critical component of a person's academic journey (Asanjarani & Zarebahramabadi, 2021).

Over the course of the preceding two decades that have passed since the completion of the final statistical assessments in this area of inquiry, the academic investigation into the complex association that exists between mathematical anxiety also academic achievement in mathematics has persistently succeeded and expanded in scope. An in-depth examination of these prior meta-analyses, in conjunction with the scholarly articles that have emerged following their publication, elucidates the necessity for clarification regarding specific inquiries that pertain to the fundamental nature of the connection among mathematics anxiety and the attainment of students in mathematics. For example it is unclear whether the aforementioned relationship is consistently observe within student population younger then fourth grade u (Ganley & McGraw, 2016; Harari, Vukovic, & Bailey, 2013) or within mature student that do not

participate in formal educational settings (Hart & Ganley, 2018), even though recent research has been conducted across various age demographic. The scope and complexity of current research have grown more complex, especially when it comes to the demographic of the sample that have(Ed5.1) been examined and the methods used to measure mathematical achievement and anxiety . Consequently, a comprehensive synthesis of this body of work holds the potential to furnish a more lucid understanding of the extent of the relationship, especially regarding the complexities that remain inadequately articulated.

During the span of the past five decades, a considerable number of researchers have dedicated their efforts to the extensive examination of the phenomenon known as mathematics anxiety. This extensive body of research indicates that a multitude of factors, including previous experiences with educators, the prevailing classroom atmosphere, and parental influences, significantly contribute to emergence of mathematics anxiety in student (Cemen, 1987; Fitzgerald, 1997). The initial identification of mathematics anxiety can be drawn back to the early 1950s, at which point scholars acknowledged that, although the emotional responses associated with mathematics anxiety bore semblance to those linked to general test anxiety, they discovered that in the context of mathematics, this particular emotional response constituted a distinct construct and subsequently labeled it as number anxiety.

The presence of anxiety can effectively disable the working memory that is requisite for the acquisition of knowledge and the resolution of mathematical problems. Mathematics anxiety is often a byproduct of diminished self-esteem coupled with a pervasive fear of failure. This psychological barrier manifests as difficulties in processing both incoming information and previously acquired knowledge that are essential for problem-solving endeavors. Students who experience heigh levels of mathematics anxiety frequently exhibit a propensity toward avoid engaging with mathematical tasks altogether (Deanne and Tina, 1986). In an struggle to mitigate the adverse effects connected by mathematics anxiety and to enhance academic performance in this subject area, Miller and Michal (1994) advocate for the creation of an educational environment characterized by positivity, devoid of stressors and potential sources of embarrassment or humiliation. This conceptual paper has effectively illustrated that significant disparities exist in the mathematical achievements of students that correlate with their respective levels of mathematics anxiety. Specifically, students who demonstrate good academic achievement tend to exhibit minor levels of anxiety, while those who struggle academically in mathematics are more likely to experience elevated levels of anxiety. Which results remain consistent with earlier research conducted by Woodard (2004) and Karimi and Venkatesan (2009), which concluded that students exhibiting high levels of anxiety typically achieve lower scores in mathematics. The students who maintain lower level of anxiety remain more inclined to attain higher scores in mathematics assessments.

Although there are different opinions on what causes mathematics anxiety, students who experience it more strongly tend to avoid learning it, have negative feelings about it, they often lack confidence in their ability to succeed do well in mathematics, and ultimately get lower grades in math classes (Ashcraft, 2002; Hembree, 1990; Ma & Xu, 2004). Martinez (1987) posited that anxiety could pose a more significant obstacle to math learning than any inherent deficiencies in school curricula or faculty development programs. Likewise, Paudel (2009) viewed mathematics anxiety among students as being largely acquired due to their absence of foundational knowledge as well as the convolution of mathematical content. Paudel's remark further revealed that mathematics anxiety among the mainstream of the students is due to other factors, such as their classroom associations, craving for mathematics, asymmetrical content, and test preparation.

The primary aim of this paper was to explore the phenomenon of math anxiety between students. Math is a highly useful, behavioral, and essential subject in human life. However, students often experience difficulty and anxiety when learning mathematics in school. Scholars have conducted extensive research on the various facets of mathematics learning and its theories. Children's lack of enjoyment in mathematics presents a challenge to all students, teachers, and parents. However, the majority of Nepalese secondary-level students face numerous challenges in mathematics.

Research Questions

1. What is the level of math anxiety of secondary school students?
2. What is the relationship among student's level of math anxiety and learning performance in mathematics?

Research Hypothesis

H_0: There is no significance difference between math anxiety of students and their learning achievement.

H_1: There is significance difference between mathematics anxiety of students and their learning achievement .

Literature Review

Causes of Mathematics Anxiety

Trezise et al. (2016) theorize with considerable belief that learners frequently support mathematical anxiety as a direct consequence of the behaviors exhibited by their educators, who themselves often exhibit a physical sense of anxiousness regarding their own mathematical competencies in several critical domains. These critical domains encompass not only the methodologies employed in teaching but also the educators' willingness and capability to provide other support to those students who are in dire essential of such support, alongside the sometimes exceedingly unrealistic expectations that teachers impose on their students regarding their mathematical performance. In contrast, Beilock and Willingham (2014) assert that in certain nations, it is a prevailing expectation for pre-service instructor to achieve a least threshold of 51% in their mathematics investigation. The inability of these pre-service teachers to surpass the 51% benchmark serves to illuminate their inadequate grasp of mathematical concepts, a deficiency which is, in a natural progression, conveyed to the learners they subsequently instruct. In this context, it becomes evident that a subset of teachers may lack the requisite knowledge and skills necessary to effectively teach certain mathematical topics that they themselves grappled by through their own educational training. Jansen (2013) says with clarity that educators who possess such experiences tend to foster negative educational experiences for the students they instruct, which, in turn, may significantly pay to the progress of mathematics anxiety among those learners.

. Suárez Pellicioni et al. (2016) explain that students negative belief and expectations about their mathematical abilities often lead to poor performance and contribute to the development of mathematics anxiety. When learners view their mathematics achievement as a reflection of their overall self-worth, low scores such as consistently scoring 50% can create felling of inadequacy. They may express this through statement like I can’t do mathematics or I hate mathematics revealing their internal struggle. Over time, these self- defeating beliefs generate stress, discomfort and a sense of inferiority in the subject, which further intensifies mathematics anxiety (Mammarella et al, 2019).

Cowan (2014) contends that anxiety constitutes a multifaceted emotional state characterized by elements of fear, worry, trepidation, and tension. In the context of engaging with mathematical tasks, fifth-grade students may experience profound trepidation when confronted with the requirement to compute complex multi-digit problems. Moreover, they may find themselves consumed by worries regarding their potential failure to successfully solve such mathematical challenges. At times, they may experience a sense of dread specifically related to the multiplication of fractions, which typically results in a heightened state of tension towards the entire multiplication topic, leading them to exhibit a marked preference for addition, subtraction, or division instead. In which regard, Suren and Kandemir (2020) further assert that anxiety is often expected through learners' own apprehensions regarding mathematics, which manifests in a manner that renders them particularly sensitive towards the subject, thereby exacerbating their overall anxiety levels in relation to mathematics. For example, it is typical for youngsters to occasionally make mistakes when performing mathematical operations, and no one is able to solve every mathematical problem. In this context, Buchsbaum (2013) highlights how students' negative responses to mistakes or failures lead them to feel that they are incapable of performing mathematics or to despise it. In this sense, mathematics anxiety is linked to a mental state that includes apprehension, concern, dread, and tension about the topic. Thus, it is true that a psychological state toward mathematics that results in apprehension, worry, dread, and tension is the root cause of mathematics anxiety.

Theoretical review

Theory of anxiety

There are many theories of anxiety in psychology, and different theories offer different explanations for the causes and mechanisms of anxiety. The psychoanalytic theory of anxiety posits that anxiety is a result of the unconscious conflict between id, the ego, too the superego. The id denotes our primitive and intuitive desires and drives; the superego signifies our internalized moral and ethical values, and the ego performance as the moderator between the two. According to this theory, anxiety arises when the ego is unable to effectively manage the conflicts between the id and superego, i.e., anxiety is a result of a conflict between unconscious impulses and the defense mechanisms that the ego uses to keep them in check. Fred (1926) believed that anxiety can arise when the ego is threatened by the desires of the id or by the demands of the superego. The ego responds to this threat by using defense mechanisms, such as repression, denial, or displacement, to keep the impulses in check. However, if the defense mechanisms fail, or if the anxiety becomes overwhelming, it can lead to psychological distress and even mental illness. This can result in a feeling of fear or dread that is often accompanied by physical symptoms such as sweating, rapid heartbeat, and muscle tension.

Psychoanalytic theory suggests that anxiety can manifest in different forms, such as specific phobias or generalized anxiety disorders (Gabbard, 2007). In the case of 45 specific phobias, anxiety arises when a person is confronted with a specific object or situation that triggers their unconscious conflicts. In the case of generalized anxiety disorder, anxiety is more diffused and not necessarily tied to a specific object or condition.

Treatment of anxiety in the psychoanalytic framework involves exploring the unconscious conflicts that are driving the anxiety and resolving these conflicts through therapy. The goal is to help the individual gain insight into the underlying sources of their anxiety and develop more adaptive coping strategies. Overall, the psychoanalytic theory of anxiety emphasizes the role of unconscious conflicts in

the progress of anxiety and suggests that effective treatment involves addressing these underlying conflicts through therapy.

Horney's theory of anxiety, also known as the "psychodynamic theory of neurosis", emphasizes the effect of social and cultural issue on the development of anxiety. Horney believed that anxiety arises from a sense of helplessness and insecurity that stems from early childhood experiences, particularly from inadequate or inconsistent parenting (Horney, 1950). According to Horney's theory, children who are raised in an environment that is emotionally unresponsive or neglectful may develop a basic level of anxiety. This anxiety arises from a feeling of helplessness and vulnerability that results from the child's inability to meet their basic needs for safety, security, and love. This sense of helplessness can lead to a sense of worthlessness and self-doubt and can manifest in a variety of anxiety symptoms.

Deficit Theory;

The 'deficit theory' first surfaced in the 1960s as an effort to explain why children from underprivileged backgrounds sometimes face high rates of academic failure. According to this notion, children from lower socioeconomic backgrounds suffer from language deprivation as a result of their financial hardship (Valencia, 1997). Students lack the language skills to succeed in school because they don't get enough verbal stimulation at home. According to the deficit theory, children from underprivileged backgrounds have lower verbal development, which results in intellectual disadvantage. Valencia (1997) defines deficit thinking as the belief that kids, especially those from low-income backgrounds and racial/ethnic minorities, do poorly in school because they or their families have inherent flaws or deficiencies that make learning difficult, for instance, low educability, lack of motivation, insufficient familial support, etc.

According to Bernstein (as cited in Muvindi & Zuvalinyenga, 2013), the deficit theory is a collection of ideas that seek to explain educational failure by attributing its causes only to outward manifestations in the child's family and neighborhood. According to Bernstein's theory, a youngster from a poor background is inherently incapable of receiving an education and is unaware of various cognitive factors at work. This theory furthermore states that a below-average performance might result in elevated worry, and those who perform less fine in mathematics at first are additional likely to have arithmetic anxiety. Research has shown that students who fight with mathematics learning difficulties have disproportionately high levels of math anxiety. Early failure in mathematics can occasionally trigger math anxiety (Park et al., 2014).

Empirical Review

Early scholarly inquiries into the emotional responses characterized by fear in relation to mathematical stimuli initially articulated this phenomenon as "number anxiety," a term that was notably introduced by Dreger and Aiken in their 1957 publication on page 344 of their work. Subsequently, this initial construct evolved into what is now widely recognized as math anxiety, a psychological condition that is comprehensively defined as a negative emotional or physiological reaction caused by mathematical stimuli, which then hinders a persons capacity carry out numerical acivities efficiently, as demonstrated by the result of Ramirez et al. (2018), and the previous work of Richardson and Suinn (1972). As noted by Ashcraft in 2002, the symptoms of this anxiety can include a wide range of emotional states, including but not limited to tension, elevated stress levels, confusion about mathematical concepts, and an overall sense of dread that permeates the individual's approach to mathematics; it can also present with a variety of physiological responses, such as an enlarged heart rate, nausea, elevated cortisol levels, or observable

changes in galvanic skin response, as highlighted in the works of Faust in 1992 and further supported by Mattarella-Micke et al. in 2011. Additionally, behavioral aspects of this anxiety may include a significant impairment in mathematical tasks.

by Korem et al. in 2022 and Richardson and Suinn in 1972. Certain scholars have advanced the argument that math anxiety should be classified within the spectrum of phobias, particularly due to its profound effects on emotional states, behavioral patterns, and cognitive processes, which strikingly parallel the criteria for phobia as delineated by the American Psychiatric Association, as posited by Faust in 1992. Furthermore, this phobia-like reaction to mathematical tasks is closely intertwined with an individual's beliefs regarding their competencies in math-related areas, which in turn significantly impacts their academic pursuits and career trajectories, a relationship that was empirically substantiated by a cross-sectional study involving 231 majors in STEM and Social Sciences conducted by Rozgonjuk et al. in 2020. This connection underscores the observation that anxiety-related responses toward mathematics are frequently associated with diminished self-esteem and a lack of perceived efficacy, alongside individual difficulties in emotional regulation, as detailed in the research by Moustafa et al. (2021) and Rozgonjuk et al. (2020). Such insights imply that an individual's experience of math anxiety is intrinsically linked to their self-perceptions and beliefs regarding their potential for success within this domain, as articulated by Finlayson in 2014. Some researchers contend that the background of math anxiety can be drawn back to learned behaviors, often acquired through the observational learning of parents and educators, as suggested by Faust in 1992 and Moustafa et al. in 2021. Additionally, the levels of math anxiety exhibited by peers, as well as the confidence levels demonstrated by instructors, further exacerbate the occurrence of math anxiety and its consequential effects on academic performance as highlighted by Finlayson in 2014 and Lau et al. in 2022. However, it is vital to note that the development of math anxiety may also be influenced by genetic factors and predispositions that render individuals more susceptible to anxiety responses, as discussed by Luttenberger et al. in 2018. Therefore, elucidating the multifaceted nature and the far-reaching implications of math anxiety is of paramount importance for both educators and students in order to devise effective strategies to moderate the effects of math anxiety, as emphasized by Finlayson in 2014.

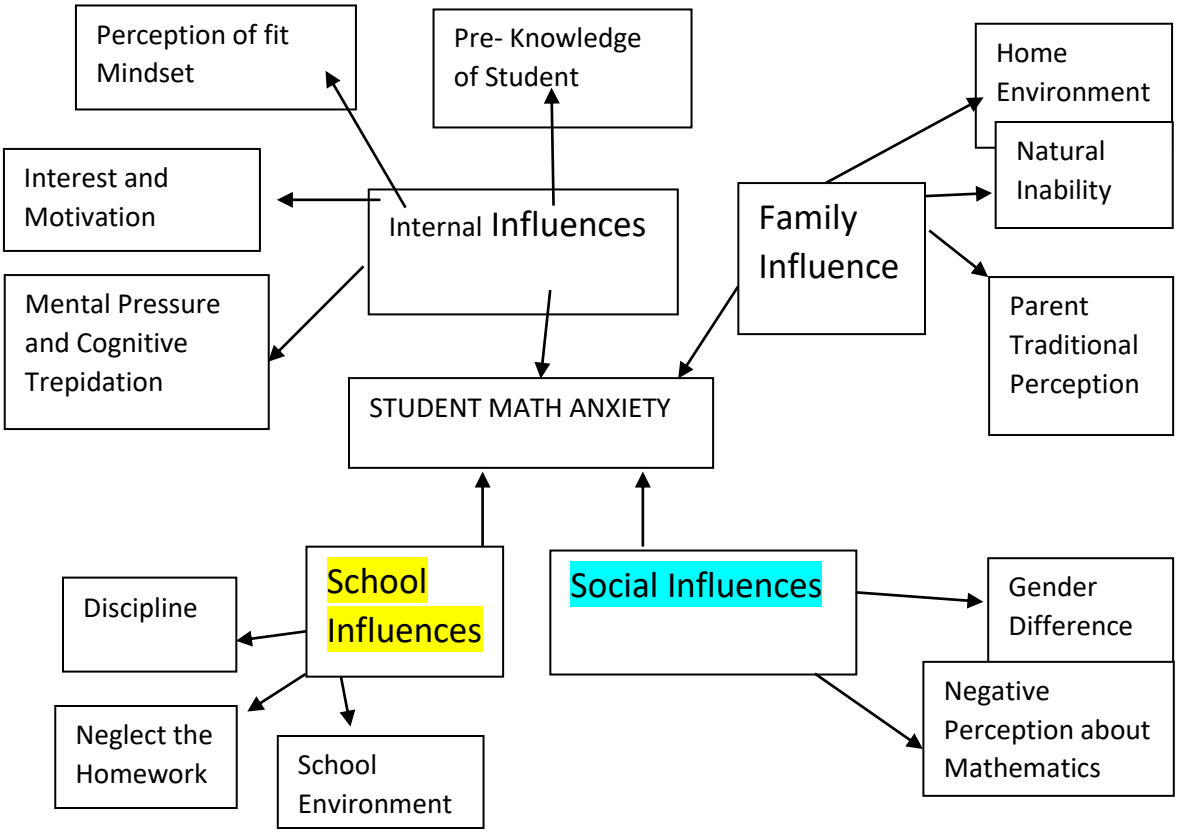
Zakaria and Nordin (2007) undertook an empirical investigation titled The Effects of Mathematics Anxiety on Enrolment Students as Associated to Inspiration and Performance which aimed to thoroughly examine the extent to which a statistically significant disparity existed between the levels of motivation and achievement among matriculation students when these individuals were categorized based on varying degrees of mathematics anxiety they experienced. The research encompassed a total of 88 participants, consisting of 73 females and 15 males, all of whom were in the concluding stages of their second semester of academic study, thereby ensuring that the findings would be reflective of students who had already garnered a substantial amount of educational experience. The constructs of anxiety and motivation were quantitatively assessed through the utilization of the Fennema-Sherman Math Anxiety Scale for anxiety measurement and the Reflectance Motivation Scale for the evaluation of motivation, ensuring robust and reliable data collection. Additionally, the Mathematics Achievement Test served as the primary instrument employed to quantify the students' academic achievement, thus providing a clear operational definition of success in the context of mathematics. The analyses conducted through ANOVA indicated that the average achievement scores, as well as motivation scores, among groups classified as experiencing low, moderate, and high levels of anxiety, was identify to be meaningfully different,

highlighting the intricate relationship between these variables. Moreover, the research findings uncovered a low but statistically significant negative correlation ($r = -0.32$, $p < 0.05$) between mathematics anxiety and academic performance, in conjunction with a more pronounced strong negative correlation ($r = -0.72$, $p < 0.05$) among mathematics anxiety and motivation, suggesting that higher levels of anxiety were connected with low levels of both performance and motivation. Furthermore, the study also disclosed a weighty low positive correlation ($r = 0.31$) among motivation and performance, indicating that as motivation increased, there was a corresponding increase in achievement levels.

Olatunde (2009) conducted a comprehensive study focusing on the intricate relationship among mathematics anxiety and academic performance within a selected group of senior secondary schools located in Southern Nigeria, thereby aiming to elucidate the complex dynamics that exist between students' understanding of mathematics anxiety and their resultant academic performance in this critical subject area. The main purpose of this extensive research endeavor was to meticulously explore and ascertain the nature of the relationship that prevails between the phenomenon of mathematics anxiety and the academic performance of students, thereby contributing valuable insights to the existing body of literature on educational psychology and academic performance. The population of the study consisted of 36 schools from senatorial districts in the southwestern part of Nigeria. The sample of this study included 1750 senior students, randomly selected from two secondary schools. We used the Mathematics Achievement Test (MAT) and the Test Phobia Questionnaire for Students (TQS) to gather information on students' fear of math, which was linked to their fear of failing tests and the subject itself. The data also showed that most of the students don't understanding how to study for math examination.

Conceptual Framework

The research concerns to examines level of mathematics anxiety and its impact on secondary school students' learning achievement. Herewith mathematics anxiety is independent variable and students' learning achievement is dependent variable. The study is guided under theory of anxiety and deficit theory. The conceptual framework is presented in follows:



Research Methodology

Research design and sampling

The study is based on a correlation survey design, which examines the association among mathematics anxiety and achievement in secondary-level students. This study was based on a quantitative research design. The population of the study consisted of all student of grade 10 in Surkhet district. Many limitations, such as time, energy, and money, did not allow the researcher to widen and extend the area and scope of this study. Therefore, the researcher selected only 2 schools and selected 215 students in both schools in the Surkhet district by using the random sampling method.

Research Instruments

Mathematics anxiety scale (MAS) and mathematics achievement test (MAT) were used to main instruments for data collection. In which MAS was adopted from Fennema and Sherman (1976) and MAT was self-constructed instrument. *Mathematics Anxiety Scale (MAS)*

The Mathematics Anxiety Scale, commonly abbreviated as MAS, constitutes a rigorously designed and empirically validated instrument consisting of a total of twelve distinct items, of which six items are articulated in a positively framed manner while the remaining six items are articulated in a negatively framed manner, thereby ensuring a comprehensive assessment of the construct of mathematics anxiety. This particular scale was meticulously developed by the renowned scholars Fennema and Sherman in the year 1976, and it is specifically tailored to capture the behavioral dimensions associated

with mathematical scenarios, a feature that has resulted in its frequent application among both school and college student populations. This tool employs Likert scale, which varieties from a mark of 1, representing strong contract, to a mark of 5, representing strong disagreement for the positively worded statements, while for the negatively worded statements, the scoring is reversed, extending from 5 (strongly agree) to 1 (strongly disagree), thereby facilitating a nuanced understanding of students' attitudes towards mathematics. The overall mathematics anxiety score is computed by aggregating the different marks of all twelve items, with the potential total score lying within a range from 12 to 60, where a lower score on the MAS signifies a lesser gradation of mathematics anxiety and a higher mark shows a greater level of mathematics anxiety experienced by the individual.

Mathematics Achievement Test (MAT)

Researcher constructed mathematics achievement test which consists of a total of thirty multiple-choice questions, each of which is accompanied by four potential options labeled A, B, C, and D, and is strategically designed to evaluate students across three cognitive levels, namely knowledge, comprehension, and application. The scoring of the test items is conducted manually, wherein each correct response is awarded one mark, while any incorrect response receives a score of zero, thus yielding a straightforward grading system. The selection of these thirty objective questions was meticulously derived following a thorough item analysis process conducted on an initial pool of thirty-six objective questions, ensuring that only the most effective items were included in the final test. The researcher systematically administered this mathematics achievement test among a cohort of thirty students from Shree Anand Secondary School located in Gumi Surkhet as part of a pilot study aimed at evaluating the efficacy and reliability of the MAT. Furthermore, as part of the analytical process, we meticulously calculated both the difficulty level (p) and the power of discrimination (D) for each test item, thereby contributing to the overall psychometric evaluation of the assessment tool.

To fulfill the intended objectives, it is necessary to collect the information as data. The following procedure had adopted to collect the statistics:

Firstly, the researcher attained agreement from the faculty to administer MAS and MAT to the identified students. Then with the permission of the course teacher, the researcher entered the class and administrated both MAS and MAT. The researcher explained the purposes of the study and ensures the confidentiality of responses.

After that the researcher briefed the students on how to answer the MAS items and MAT items and assists them, they have problem to understand the items. Student was required to complete the MAS items in 20 minutes and MAT items in 60 minutes. The MAT test items in were hand scored each correct marks received one mark while, a bad answer received zero points.

The Data Analysis Procedure

Collected data was analyzed using SPSS 23 version. The level of mathematics anxiety was determined by using descriptive statistics as frequency and percentage and compared with common psychometric practice of dividing scale score into tertile-based categories for interpretation by Cohen and Swerdlik(2018). Similarly, correlation was used to examine relationship between mathematics anxiety and students learning achievement. Moreover, the results were analyzed using tables.

Correlations

			Anxiety rating scale (RMARS)	Students Mathematics Learning Achievement
Spearman's rho	Anxiety rating scale (RMARS)	Correlation Coefficient	1.000	-.136*
		Sig. (2-tailed)	.	.047
	Students Mathematics Learning Achievement	Correlation Coefficient	-.136*	1.000
		Sig. (2-tailed)	.047	.

Table 2 Shows, the Spearman's rho correlation which was computed to observe the relationship among students' mathematics anxiety (as measured by the RMARS) and their mathematics learning achievement. The investigation revealed a statistically weighty negative correlation among math anxiety and performance r=−0.136, p=0.047 r = -0.136, p = 0.047rs=−0.136, p=0.047. This suggests that higher levels of mathematics anxiety are associated with lower mathematics performance between students. Although the correlation is weak, it is statistically significant at the 0.05 level, indicating that math anxiety may be contributing factor to students' lower performance in mathematics.

Results

Table 1

Math Anxiety level of the students

Level of MA	Low Anxiety Level	Medium (Average) Anxiety Level	High Anxiety Level	Total
Frequency	14	180	21	215
Percent	6.5	83.7	9.8	100

Table 1 shows the distribution of students affording to their level of mathematics anxiety. The majority of students (83.7%) were found to have a medium (average) level of math anxiety. A smaller proportion of students (9.8%) exhibited a high level of math anxiety, while only 6.5% reported experiencing a low level of anxiety towards mathematics. These findings show that math anxiety is dominant among students, with most experiencing it at a moderate level.

Table 2

Relationship between level of math anxiety and learning achievement (N=215)

Discussion

This study found a strong correlation between students' mathematics anxiety and academic achievement. Students with high levels of math anxiety have lower achievement rates, while those with low anxiety levels are more likely to excel. The evidence suggests that students who perform well in mathematics typically possess a stronger conceptual understanding and greater confidence, which contributes to reduced anxiety. In contrast, students who struggle with mathematics may lack these foundational elements, thereby experiencing heightened anxiety that negatively affects their performance.

These findings are consistent with those of Woodard (2004) and Karimi and Venkatesan (2009), reported that students through math anxiety level is high generally earn lower scores in mathematics, while students with low anxiety tend to achieve higher scores. The persistence of math anxiety among secondary school students, as evidenced which study, underscores the need for continued attention to emotional and psychological barriers in the learning process.

Interestingly, the data also suggest that gender-related factors do not significantly influence mathematics anxiety, implying that the experience of anxiety in mathematics is broadly shared among students, regardless of gender.

The outcomes point to the importance of addressing math anxiety as part of comprehensive teaching strategies. As Yüksel-Şahin (2008) recommends, teachers should adopt supportive and positive teaching practices that encourage students to build healthy attitudes toward mathematics. Furthermore, Smith (2004) emphasizes the importance of teachers modelling enthusiasm for the subject, which can enhance student motivation and help alleviate anxiety.

This study has important implications for educators, schools, and parents. It highlights the need to identify and address math anxiety when designing teaching approaches and educational interventions. By fostering a positive learning environment and implementing strategies aimed at reducing anxiety such as differentiated instruction, confidence-building activities, and regular feedback stakeholders can support students in overcoming their fears and achieving better outcomes in mathematics.

Conclusion

This study concludes that mathematics anxiety is prevalent among secondary-level students, with the majority experiencing it at a moderate level. Importantly, the analysis reveals statistically weighty negative correlation among students' math anxiety and their performance in mathematics. As anxiety increases, achievement tends to decrease, though the effect size remains modest. These findings suggest that educators, policymakers, and curriculum designers should pay close attention to the emotional well-being of students in relation to mathematics learning. Interventions aimed at reducing anxiety, such as confidence-building activities, supportive teaching strategies, and early identification of high-anxiety students, may contribute to improved learning outcomes. Future research may further explore the underlying causes of math anxiety and examine effective approaches to mitigating its impact on academic performance.

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