Factors that Affect Primary School Teachers' Anxiety in Teaching Mathematics in Western Belize

Zenaida Romero[1]
Mathias R. Vairez Jr.[1]
Olga Manzanero[1]
Janeen Quiroz[1]

Abstract

This quantitative study investigated teachers' anxiety levels in teaching mathematics, the relationship, and prediction effect of variables such as teaching experience, educational attainment, and teacher self-efficacy. A Google survey was completed by primary school teachers in the Cayo District and data were analyzed by descriptive statistics and a multiple linear regression statistical test. Results revealed that teachers' anxiety level in teaching mathematics was at the medium level. The variables indicated a strong significant relationship to teachers' anxiety in teaching mathematics. General math anxiety and its social/evaluative subcategory resulted as positive predictors, while efficacy in instructional strategies resulted as a negative predictor of teachers' anxiety in teaching mathematics. When teachers' general math anxiety increased, their anxiety in teaching mathematics also increased; if their anxiety levels increased when being evaluated, their anxiety in teaching mathematics also increased. The findings support investments to increase teachers' efficacy in instructional strategies, therefore, decreasing teachers' anxiety in teaching mathematics.

Keywords: Math anxiety, teacher self-efficacy, teacher, mathematics, Belize

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[1] University of Belize

Corresponding Author: Zenaida Romero, Faculty of Education & Arts, University of Belize, Hummingbird Avenue, Belmopan, Cayo, Belize. email: zenaida.romero@ub.edu.bz

Introduction

The world is changing rapidly, and there is increased pressure for students to be prepared with the abilities and skills to face the challenges of the 21st century (Alkan et al., 2019). Mathematics is one of the major subjects that provide students with the opportunity to gain these 21st-century skills, allowing them to become more analytical, critical, and creative and gain problem-solving and reasoning skills (Alkan et al., 2019). These are essential skills for individuals to possess in order to analyze different problems and find solutions. Hence, the importance of learning and teaching mathematics has increased and become significantly imperative in schools today (Alkan et al., 2019). In addition, mathematics is important for careers in Science, Technology, Engineering, and Mathematics (STEM), which are essential for the advancement of society.

As mathematics is an essential subject, teachers are considered one of the most important factors in contributing to students' mathematics learning (Alkan et al., 2019). In fact, there is no doubt mathematics teachers are one of the most crucial catalysts to facilitate the mathematical content knowledge to their students and impart confidence in mathematics (Julaihi et al., 2019). Hence, mathematics teachers with higher confidence are believed to be more competent in delivering constructive and fruitful lessons (Norton, 2019). In addition, mathematics teacher self-efficacy beliefs, a characteristic closely related to teacher confidence level, are apparently a contributing factor to students' motivation and performance outcomes (Tschannen-Moran & Woolfolk Hoy, 2001; Norton, 2019).

Over the years, the Government of Belize has emphasized and seriously invested in education, with 7 percent of Gross Domestic Production (GDP) in FY 2011-2012 and a probable 6.8 percent of GDP in FY 2012-2013 (Naslund-Hadley et al., 2013). The percentage spending on education has shown a drastic increase, with an average of 4.8 percent of GDP in the OECD (Organization for Economic Co-operation and Development) countries (Naslund-Hadley et al., 2013). For 2020-2021, the Ministry of Education's recurrent expenditure by sub-sector has increased to 46.6% for pre-primary and primary, 30.1% for secondary, 10.1% for tertiary, and 13.2% for other (Ministry of Education, 2021).

Despite high levels of spending on education, the PSE and CSEC performances in mathematics remain extremely low (Naslund-Hadley et al., 2013). The PSE performance in math has slightly increased over the years, but remains remarkably low: 50.6% passed in 2016; 51.9% passed in 2017; 52.7% passed in 2018; and 53.9% passed in 2019 (Ministry of Education, 2020). Naslund-Hadley et al. (2013) reported, at the primary level, there is a strong positive connection (0.74) between the percentage of qualified teachers and students' academic performances (based on PSE results). Moreover, the low level of teacher training is reflected in low content skills (Mathematics, English, and Science) and outdated pedagogical models (Naslund-Hadley et al., 2013), which links to lower teacher confidence and self-efficacy (Umugiraneza et al., 2016). Also, learning and teaching mathematics is a crucial matter affected by both students' and teachers' anxiety and teachers' anxiety in teaching mathematics (Alkan et al., 2019). Hence, teachers play an essential part in students' performance and achievement.

There is a severe inadequacy of trained and qualified teachers at all system levels and limited enforcement of accountability (Naslund-Hadley et al., 2013). The challenges are significant, but there have not been improvements over the years to increase students' math achievement. Therefore, the study of teachers' anxiety is especially important because research indicates that teacher anxiety influences teacher performance and affects students' anxiety, achievement, and attitudes toward school (Tschannen-Moran & Woolfolk Hoy, 2001). Therefore, the purpose of this study was to identify factors that affect primary school teachers' anxiety in teaching mathematics in Western Belize. More specifically, the study sought to determine teachers' level of anxiety in teaching mathematics and whether the factors – gender, age, location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy – significantly affect teachers' anxiety in teaching mathematics. Thus, the following three research questions guided this study:
      1. What is primary school teachers' level of anxiety in teaching mathematics?
      2. Is there a statistically significant relationship between teachers' anxiety in teaching mathematics and the combination of gender, age, location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy?

3. Can primary school teachers' anxiety in teaching mathematics be predicted by gender, age, location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy?

Review of the Literature

Teacher Math Anxiety

Math anxiety is an important and common problem in learning and teaching. Boyd et al. (2014) contend there is a strong societal expectation for teachers to be competent in mathematical skills and teach effectively so their students are successful in mathematics. The most often-used definition of mathematics anxiety is "the feelings of tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations" (Richardson & Suinn, 1972, p. 551). Research on preservice teachers reveals that teachers with higher levels of anxiety might unintentionally transfer their negative feelings and fear of mathematics to students (Bursal & Paznokas, 2006; Gresham, 2007; Beilock et al., 2010; Sloan, 2010; Boyd et al., 2014; Haciomeroglu, 2014). Richland et al. (2020) concur that teachers with higher mathematics anxiety may strongly impact students' math anxiety, reflected in students' poor math achievement. Additionally, Gresham (2007) revealed that preservice teachers do not possess high anxiety levels when teaching other subjects.

Anxiety in teaching mathematics is "defined as teachers' feelings of tension and anxiety that occur during mathematical teaching concepts, theories, and formulas or problem-solving" (Peker, 2009). Research has revealed that preservice teachers with higher levels of mathematics anxiety are less confident when teaching mathematics (Gresham, 2008). In addition, teachers who lack confidence in teaching mathematics avoid teaching certain aspects of mathematics, frequently using the same pedagogies, delivering only the simple concepts, or emphasizing procedural skills over conceptual knowledge and problem-solving in a mathematics lesson (Bobis et al., 2016; Alkan et al., 2019; Julaihi et al., 2019). Moreover, research has shown that teachers' math anxiety can affect students' learning outcomes (Beilock et al., 2010; Ramirez et al., 2013).

Mathematics teaching anxiety has a significant role when introducing abstract concepts in a more concrete or understandable way for students (Haciomeroglu, 2014). Peker (2009) reported that preservice teachers felt extremely nervous and incapable of concentrating on their teaching because of their high level of mathematics teaching anxiety; they were easily distracted by noises in the classroom and had difficulty understanding students. Ramirez et al. (2018) concur that math-anxious teachers may not have adequate mathematical knowledge to teach mathematics. Moreover, Ramirez et al. (2018) suggest that math-anxious teachers' actions and behaviors are centered on memorization and innate ability, which corresponds with a fixed mindset rather than a growth mindset; teachers lack varying teaching methods. Similarly, Finlayson (2014) associated teachers' high math anxiety with inappropriate and inadequate teaching methods. Teachers with high math anxiety use monotonous teaching strategies like exercising, practicing, and memorizing formulas, affecting students' motivation, participation, and anxiety (Boyd et al., 2014).

Teacher Self-Efficacy

Teachers with high self-efficacy show perseverance in their quest for success, are resilient in finding solutions to obstacles, and find the time to motivate their students for success (Nurlu, 2015). Nurlu (2015) compared teachers with high self-efficacy to those with lower self-efficacy to be more open to innovative ideas and use different strategies to meet the student's needs. Teachers with high teaching self-efficacy demonstrate greater interest and commitment to education and are more likely to remain in the profession (Tschannen-Moran & Woolfolk Hoy, 2001; Patkin & Greenstein, 2020). In addition, Zuya et al. (2016) pointed out that a high sense of teaching self-efficacy is related to positive teaching behavior, where teachers use effective methods in their teaching. In turn, the students learn more. Fives (2003) agrees that the teachers' teaching efficacy level affects their everyday instruction decisions and their preparedness to appropriately choose specific strategies and techniques.

In contrast, teachers with low self-efficacy in teaching mathematics may drastically impact students' mathematics anxiety (Beilock & Willingham, 2014: Finlayson, 2014). Teachers with low self-efficacy tend to devalue the subject and exhibit passive or sarcastic behavior (Pacinello, 2018). In addition, mathematics teachers with low self-efficacy avoid teaching certain mathematical concepts or do not apply adequate time to teach these essential topics (Alkan et al., 2019). For instance, Peker (2009) posits that teachers' self-efficacy plays a role in determining the methods and strategies the teacher uses in the classroom, which plays a significant part in student engagement and learning. Thus, teachers with low self-efficacy lack varying teaching strategies, so they are inclined to teach in traditional ways, relying more on textbooks and memorization (Hayes, 2016).

Teacher efficacy is a successful characteristic of a mathematics teacher, which, if possessed at higher levels, will allow the teacher to be more competent in delivering constructive lessons and positively relates to the student's confidence in mathematics, student's higher performance, and liking of mathematics (Kleinsasser, 2014; Umugiraneza et al., 2016; Sandoval-Hernández & Białowolski, 2016; Norton, 2019; Julaihi et al., 2019). Peker (2009) agrees that teachers who have high self-efficacy may create a secure classroom environment, directly affecting student achievement. In addition, teachers with high self-efficacy dedicate more classroom time to academic learning, assist students with difficulty, and reward them for their accomplishments (Tschannen-Moran & Barr, 2004).

Machado et al. (2009) accentuated the requirement for skilled instruction in schools, with a positive atmosphere and dynamic leadership to ensure students' success, with a solid relationship to high academic achievement. Tucker et al. (2005) agree with the need for the best and most efficacious teachers to ensure students' success. Hence, productive teachers with high confidence demonstrate more commitment to remain in the profession and develop a learning setting appropriate for student success (Tucker et al., 2005).

Teachers' high self-efficacy is related to many meaningful educational outcomes, such as persistence, enthusiasm, commitment, instructional behavior, and perseverance at challenging tasks (Tschannen-Moran & Woolfolk Hoy, 2001). Blazevski (2006) pointed out:

> She would be more likely to engage in instructional behavior designed to support student motivation, be more resilient when faced with difficult students, and ultimately be more successful in supporting student's motivation than a teacher who feels less efficacious in this regard. (p. 11)

Effects of Gender on Teacher's Anxiety and Self-Efficacy

Blazevski's (2006) study suggested a teacher's characteristics such as gender, may predict a teacher's sense of efficacy. Stoehr (2017) revealed that more female teachers experience higher levels of mathematics anxiety when compared to male teachers.

A study by Beilock et al. (2010) found that first and second-grade female teachers' math anxiety predicted lower math achievements for female students. A study by Mizala et al. (2015) conducted with preservice primary school female teachers illustrated that teachers who experienced math anxiety expected their future students (especially females) to demonstrate a lower level of success in math. However, Richland et al. (2020) found that teachers' math anxiety does not depend on gender or content knowledge. Other studies have shown that the confidence level and self-efficacy beliefs in teaching mathematics are generally similar between genders (Levin, 2013; Mamon, 2015).

Effects of Teaching Experience on Teacher's Anxiety and Self-Efficacy

Patkin and Greenstein (2020) revealed that preservice teachers (students) experienced higher math anxiety and math teaching anxiety than in-service teachers, reflecting the lack of teaching experience. In the same study, preservice teachers without specialized mathematics education showed a high level of math anxiety, which decreased as their mathematics teaching experience increased. In addition, the in-service teachers without specialized mathematics education demonstrated a higher level of math anxiety than those who specialized in the subject (Patkin & Greenstein, 2020).

Blazevski (2006) suggested that teacher characteristics such as years of teaching experience and educational attainment may predict a teacher's sense of efficacy. Also, Umugiraneza et al. (2016) found that confidence grows with teaching experience and professionalism. In addition, trained teachers and pedagogical content knowledge may be critical to the student's success (Blazevski, 2006). In contrast, other studies have shown that confidence levels and self-efficacy beliefs in teaching mathematics are generally similar among teachers with different years of teaching experience (Alrefaei, 2015; Sutton, 2018) and closely related to the highest degree or knowledge of a teacher (Alrefaei, 2015). Julaihi et al. (2019) reported from a study done in Malaysia that the categories of less-experienced mathematics teachers (with less than five years of teaching experience) and more-experienced mathematics teachers (with more than ten years of teaching experience) contributed equally to the improving performance of the students in TIMSS 2015 (Trend in International Mathematics and Science Study).

Conceptual Framework

Teachers are a crucial factor in forming students' mathematical attitudes and achievements. Nurlu (2015) agrees that teachers' anxiety about mathematics and their self-efficacy to organize and prepare their instructional strategies affect students' future engagement and achievement. More so, teachers' general self-efficacy and math anxiety are significant factors that influence their anxiety levels in teaching mathematics (Hayes, 2016). In addition, other factors were explored to understand their relationship to teacher anxiety in teaching mathematics. This framework allowed the researcher to understand the variables and test if they could predict teacher anxiety in teaching mathematics.

The Conceptual Framework (Figure 1) designed for this study shows that students' math achievement depends on the teachers' anxiety in teaching mathematics. However, many factors affect teachers' anxiety in teaching mathematics. The conceptual framework examines two significant factors: teacher math anxiety and self-efficacy. In addition, the framework explores aspects such as gender, location, teaching experience, age, and leadership support, that affect teacher anxiety and self-efficacy, which in turn affect anxiety in teaching mathematics.
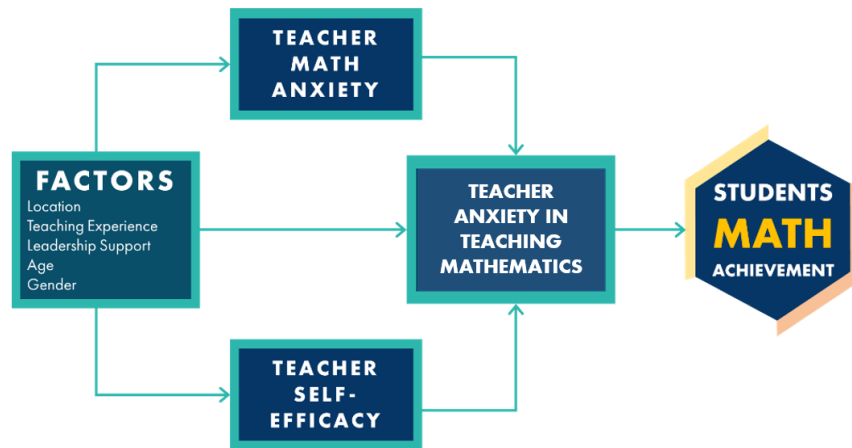

Figure 1. Conceptual Framework

Methodology

A quantitative method with a correlation/prediction design was used for this study. The correlational analysis is used to measure the degree of association between independent variables (predictors) and the dependent variable (Outcome variable). A correlation coefficient indicates whether the variables are related or whether they can predict the other (Creswell, 2015).

Population and Sample

The population for this study was all primary school teachers in Western Belize. Based on the Ministry of Education (2021) Abstract of Educational Statistics, there were 860 teachers in Western Belize (Males = 218, Females = 642). This research used random sampling by voluntary/self-selection, which included participants who were "willing and able to be studied" (Creswell, 2015, p. 144). The sample was 265 primary school teachers from Western Belize, which yielded a 5.01% margin of error with a 95% confidence level (Raosoft, 2004).

Of the 265 teachers who participated in the study, 14.7% were males and 85.3% were females. For location, 55.8% of the teachers taught in rural schools while 44.2% taught in urban schools. The majority of the teachers' highest level of educational attainment was an associate's (57%) or bachelor's degree (35.8%). Only a few teachers had a master's (4.9%) or a doctorate degree (0.8%). The average age of the teachers was 38 years (SD = 8.49) and their average years of teaching experience was 14 years (SD = 8.54).

Instrumentation

To collect the data for this study, two instruments were used – the Mathematics Anxiety Scale for Teachers (MAST) and the Ohio State Teacher Efficacy Scale (OSTES). Ganley et al. (2019) reported on the construct validation of the MAST, which resulted in efficient administration for large-scale studies. This scale consists of 19 items: eleven corresponds to General Math Anxiety (GMA), and eight corresponds to Anxiety about Teaching Mathematics (ATM) using a Likert-type 5-point scale (1 = not true of me at all, 2 = generally not true of me, 3 = somewhat true of me, 4 = generally true of me, 5 = very true of me). The MAST is reported to have excellent reliability with Cronbach's alpha coefficients of .96, .97, and .91 for the overall scale and the two subscales, respectively (Ganley et al., 2019). The OSTES has 12 items using a Likert-type 9-point scale with 1 = nothing, 3 = very little, 5 = some influence, 7 = quite a bit, and 9 = a great deal with three dimensions of teaching (a) efficacy in student engagement, (b) efficacy in instructional strategies, and (c) efficacy in classroom management. The OSTES has good reliability with Cronbach's alphas of .939, .864, .888, and .886 for the overall scale and three subscales, respectively (Tschannen-Moran & Woolfolk Hoy, 2001). The overall instrument for this study was divided into four sections: approval and confidentiality; demographic data, including gender, age, location, teaching experience, educational attainment, and leadership support using a low, medium, and high scale; the MAST - 19 items on General Math Anxiety (GMA) and Anxiety about Teaching Mathematics (ATM); and the OSTES to measure the self-efficacy construct.

Data Analysis

The data were analyzed using IBM SPSS 23 statistical software. Descriptive statistics were computed to determine teachers' level of anxiety in teaching mathematics. Further, multiple linear regression was conducted to test for statistically significant relationships between the eight independent variables (age, gender, age, location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy) and the dependent variable (anxiety in teaching mathematics) and to determine which independent variables can predict teachers' anxiety in teaching mathematics.

Results

To answer the first research question, descriptive statistics were used to determine teachers' level of anxiety in teaching mathematics which was measured using a Likert-type 5-point scale. The results from Table 1 revealed that the teachers' average level of anxiety in teaching mathematics was at the medium level ($\bar{x}$ = 2.5, SD = 1.1). On average, female teachers ($\bar{x}$ = 2.6, SD = 1.1) reported a higher level of anxiety in teaching mathematics than male teachers ($\bar{x}$ = 2.1, SD = .9). Further, teachers with an associate's degree ($\bar{x}$ = 2.6, SD = 1.1) reported the highest average level of anxiety in teaching mathematics. Teachers with a bachelor's degree ($\bar{x}$ = 2.4, SD = 1.0) reported slightly below the average level of anxiety in teaching mathematics but higher than teachers with more advanced degrees. Teachers with a master's degree ($\bar{x}$ = 2.2, SD = .9) and doctorate Degree ($\bar{x}$ = 2.3, SD = 1.0) reported lower average anxiety levels in teaching mathematics. Finally,

teachers with only a high school diploma ($\bar{x}$ = 1.9, *SD* = .9) reported the lowest average anxiety level in teaching mathematics.

Table 1. Teachers' Anxiety Level in Teaching Mathematics			
Characteristics		Mean	SD
Gender	Female	2.6	1.1
	Male	2.1	.9
Educational Attainment	High School Diploma	1.9	.9
	Associate's Degree	2.6	1.1
	Bachelor's Degree	2.4	1.0
	Master's Degree	2.2	.9
	Doctorate Degree	2.3	1.0
	Overall Average	2.5	1.1

To answer the second research question, a multiple linear regression was conducted using a stepwise design to determine if there was a statistically significant relationship between teachers' anxiety in teaching mathematics and the combination of gender, age, location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy. The results revealed that *R* = .806, which indicated a strong relationship between the dependent variable and the combination of the independent variables. Thus, the combined relationship of the independent variables had an 80.6% chance of influencing teachers' anxiety in teaching mathematics. Further, R^2 = .650, which indicated that about 65% of the variation in teachers' anxiety in teaching mathematics was explained by the resulting regression model, which included General Math Anxiety, Social/Evaluative, and Efficacy in Instructional Strategies. Therefore, the null hypothesis (H_0: *R* = 0, R^2 = 0): There is no statistically significant relationship between a teacher's anxiety in teaching mathematics and the combination of gender, age, location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy was rejected.

To answer the final research question, the results from the ANOVA and Coefficients Tables from the multiple linear regression from research question two were used to determine if primary school teachers' anxiety in teaching mathematics can be predicted from the independent variables. The results indicated a significant proportion of the total variation in teachers' anxiety about teaching mathematics can be predicted from the predictors in the resulting model: General Math Anxiety, Social/Evaluative, and Efficacy in Instructional Strategies, $F(3, 261)$ = 161.503, *p* < .01. Therefore, the null hypothesis (H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$): Primary school teachers' anxiety in teaching mathematics cannot be predicted by gender, age, location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy was rejected. The multiple regression model tested was:

$$\hat{Y} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + error$$

Where: X_1 = Gender $\hat{Y}$ = Anxiety in teaching mathematics
X_2 = Age
X_3 = Location
X_4 = Teaching Experience
X_5 = Education Attainment
X_6 = Leadership Math Support
X_7 = Math Anxiety
X_8 = Teacher Self-efficacy

The overall model was significant. However, of the eight predictors tested, only three were significant predictors of teachers' anxiety in teaching mathematics: General Math Anxiety, Social/Evaluative, and Efficacy in Instructional Strategies, as shown in Table 2. Gender, age, teaching experience, educational attainment, and leadership support were not significant predictors of teachers' anxiety in teaching mathematics. For general math anxiety, the unstandardized partial slope (.486) is statistically significantly different from 0 ($t = 6.213$, $df = 3$, $p < .01$). Thus, with every one-point increase in general math anxiety, teachers' anxiety in teaching mathematics increased by .486. For social/evaluative, the unstandardized partial slope (.278) is statistically significantly different from 0 ($t = 4.002$, $df = 3$, $p < .01$). Thus, with every one-point increase in social/evaluative, teachers' anxiety in teaching mathematics increased by .278. For efficacy in instructional strategies, the unstandardized partial slope (-.139) is statistically significantly different from 0 ($t = -3.731$, $df = 3$, $p < .05$). Thus, with every one-point increase in efficacy in instructional strategies, the teachers' anxiety in teaching mathematics decreased by .139. Therefore, the resulting regression model was:

$$\hat{Y} = 1.529 + .486X_1 + .278X_2 - .139X_3 + error$$

Where: X_1 = General Math Anxiety $\hat{Y}$ = Anxiety in teaching mathematics
X_2 = Social/Evaluative
X_3 = Efficacy in Instructional Strategies

Table 2. Multiple Linear Regression Coefficients				
Model	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	1.529	.305	5.008	.000
General Math Anxiety	.486	.078	6.213	.000
Social/Evaluative	.278	.069	4.002	.000
Efficacy in Instructional Strategies	-.139	.037	-3.731	.000
Dependent Variable: Anxiety about teaching Math				

Conclusions

Teachers' average level of anxiety in teaching mathematics was at the medium level, and female teachers had a higher level of anxiety in teaching mathematics than male teachers. This finding is supported by other research that suggests that female teachers have higher math anxiety than male teachers (Blazevski, 2006; Beilock et al., 2010; Stoehr, 2017; Schmitz et al., 2019). Teachers with an associate degree reported the highest average level of anxiety in teaching mathematics, and the higher degrees, master's, and doctorate degrees, reported slightly below average anxiety. Teachers with a High School Diploma reported the lowest anxiety level in teaching mathematics. The study's results confirmed that the teachers' level of anxiety in teaching mathematics was at the medium level. Richland et al. (2020) pointed out that the teachers' level of mathematics anxiety significantly influences students' math anxiety, which may lead to poor math engagement and performance.

There was a highly significant relationship between teachers' anxiety in teaching mathematics and the variables tested: gender, age, school location, teaching experience, educational attainment, leadership support, math anxiety, and teacher self-efficacy. The results indicated that the combined relationship of the independent variables had an 80.6% chance of influencing teachers' anxiety in teaching mathematics. The model tested explains about 65% of the variation in teachers' anxiety in teaching mathematics. The combination of the independent variables had a significant relationship with teachers' anxiety in teaching mathematics.

Although a significant relationship was noted, only three variables were significant predictors of teachers' anxiety in teaching mathematics: general math anxiety, social/evaluative, and efficacy in instructional strategies. The relationship between teachers' anxiety in teaching mathematics and math anxiety revealed a positive correlation, indicating as teachers' math anxiety increased, their anxiety in teaching mathematics increased. A study by Gresham (2008) revealed preservice teachers with higher mathematics anxiety appear less confident when challenged to teach mathematics. Furthermore, Ramirez et al. (2018) posit that math-anxious teachers may not have adequate mathematical knowledge to teach mathematics, lacking varying teaching strategies and emphasizing mainly memorization. The relationship between teachers' anxiety in teaching mathematics and the social/evaluative variable revealed a positive correlation, indicating as teachers' anxiety in being evaluated increased, their anxiety in teaching mathematics increased. Thus, the positive correlation between teachers' anxiety in teaching mathematics and anxiety in being evaluated is a critical factor. The relationship between teachers' anxiety in teaching mathematics and efficacy in instructional strategies indicated a negative correlation, suggesting that their anxiety in teaching mathematics decreased as teachers' efficacy in instructional strategies increased. A study by Peker (2009) revealed that teachers' self-efficacy plays a vital role in identifying the various teaching methods and strategies to apply in the classroom. Teacher efficacy is a successful characteristic of a mathematics teacher, which, if possessed at higher levels, will give the teacher more confidence in delivering constructive lessons (Kleinsasser, 2014; Umugiraneza et al., 2016; Sandoval-Hernández & Białowolski, 2016; Norton, 2019; Julaihi et al., 2019). Therefore, the literature corresponds with the study's results, indicating that teachers' anxiety in teaching mathematics decreases as teachers use effective instructional strategies.

Recommendations

There are many factors affecting teachers' anxiety in teaching Mathematics. Administrators, educators, and researchers can explore or test the conceptual model presented in this study as a framework for investigating teachers' math anxiety in teaching mathematics.

Policies to ensure the redesign of educational courses and programs to focus on developing pedagogy and instructional skills to reduce teachers' anxiety in teaching mathematics can be developed by the Ministry of Education personnel after consultation with other stakeholders. Professional development and teacher training must focus on teachers' cognitive and non-cognitive skills, such as reducing math anxiety, increasing teacher efficacy, and increasing growth mindset. Principals or administrators must be well prepared to conduct fair evaluations of teachers and implement clinical supervision before evaluation to help reduce anxiety from evaluation. Teachers and administrators must embrace math anxiety in teaching mathematics by understanding the factors affecting it and understanding how anxiety around mathematics is not an individual matter or responsibility.

This research has provided an essential background into teachers' anxiety in teaching mathematics, highlighting the correlated factors that can predict teachers' anxiety in teaching mathematics. Thus, future collaborative research could include replicating and expanding this study through a national investigation, expanding the scope of areas such as leadership math support, teacher evaluation as a component of math anxiety, and effective instructional strategies for teachers who experience anxiety with math, and investigating students' math anxiety in Belizean primary schools. Research to examine the effect of the factors explored in this study on students' math achievement can be conducted as well as implementing intervention programs to increase teachers' efficacy in math instructional strategies. Also, conduct a study to explore variations in teachers' anxiety levels based on educational attainment, gender, age, location, and other variables and to examine why variations exist.

Competing Interests

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