

## Exploring teacher effects on intensifying and minimizing mathematics anxiety among students in Sokoto State, Nigeria

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### ABSTRACT

Mathematics anxiety is the feeling of tension and fear which interferes with the manipulation of numbers in ordinary life and academic setting. This study aimed at exploring students' level of mathematics anxiety and teacher behavior and speech which intensifies and minimizes mathematics anxiety among secondary schools in Sokoto state, Nigeria. In total, 109 questionnaires regarding mathematics anxiety named the cognitive, emotion, physical-mathematics anxiety rating (CEP-MAR) were distributed to students and 102 were returned. From the responses in the questionnaire, 20 of the most mathematics anxious individuals were selected to participate in a photovoice project. These 20 students were given cameras and asked to capture classroom events, which impact on their mathematics anxiety. Afterwards, a one-to-one semi-structured interview was conducted with each student to discuss the photos. The findings disclosed that teachers' behavior and speech such as being too quick in mathematics classroom lessons, giving too many notes, exercises, punishments and embarrassing/alarming statements have a significant effect in intensifying mathematics anxiety. The findings also showcased that quiz/competitions, good learning environment, intrinsic and extrinsic motivational statements help in minimizing mathematics anxiety. This study provides further evidence that teachers have both positive and negative effect on students' mathematics anxiety.

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## 1. INTRODUCTION

Anxiety is a result of strain, stress and tension or confusion from an individual's mind and body [1]. Mathematics anxiety has various definitions [2], including the feeling or experiencing of tension and fear which interferes with the manipulation of numbers and solving of mathematical issues in a wide variety of ordinary life and academic situations causing forgetfulness and loss of self-confidence in a person [3]. It is also a negative effect and the stress of an individual when dealing with mathematical issues [4]–[6]. Escalera-Chávez *et al.* [7] defined mathematics anxiety as a state of anxiety caused by performing mathematics tasks and which is demonstrated with a feeling of apprehensions, stress, frustration, aversion, worry, and fear.

Mathematics anxiety can interfere with student performance, interest, and motivation in learning mathematics. It can hinder them from taking further mathematics courses in the future or enrolling in mathematics heavy programs such as engineering and technical programs [8]. In the long run, if mathematics anxiety is prevalent in the society, it can hamper the development of the country as the community shies

away from research and development practices that require the use of mathematics knowledge. Mathematics anxiety remains to be a fascinating area of study for many researchers and this study intends to enhance understanding about the sources of mathematics anxiety, primarily from teacher behavior and speech. The purpose is so that teachers can be more aware of what they say and do that can deter students' interest in mathematics due to the anxiety they have developed in the subject. In particular, Nigeria appears to report high mathematics anxiety among its students [9].

## 2. LITERATURE REVIEW

In general, there are three symptoms that are related to mathematics anxiety, which are physical, emotional and cognitive symptoms [10]. The physical symptoms are those that individuals demonstrate when affected by fear of mathematics, such as a nervous stomach, biting nails, difficulty breathing and sweatiness. Mathematics anxiety can be seen as the characteristics of an individual with learning problems and can be considered to be both emotional and natural [11], [12] stated that the relationship between mathematics anxiety and mathematics achievement can be understood as a psychological function of the emotional reaction. The emotional symptoms of mathematics anxiety have to do with inner feelings, like lack of confidence, feeling of helplessness, confusion, or feeling of tiredness in a mathematics lesson. Often, a student may just want to quit and go home as a result of being stressed out on the subject [13]. The cognitive symptoms of mathematics anxiety are attributed to mental ability and predisposition of mathematics, such as inability to concentrate, negative self-talk and excessive worrying [14].

In research carried out in Nigeria for pre-service teachers, mathematics anxiety is gender sensitive and the majority of the respondents (72.5%) had an excessive level of mathematics anxiety [15]. When pre-service teachers exhibit such unnecessary high levels of mathematics anxiety, one can imagine their potential students' level of mathematics anxiety. Furthermore, another critical problem explored by the researchers in the Nigerian context is concerning gender sensitivities of the mathematics anxiety. It proved that females experience more anxiety than their male counterparts. This is notwithstanding the fact that some authors of mathematics textbooks use pictures of boys when demonstrating mathematics phenomena, thereby neglecting their female counterparts, which is seriously affecting them. A female teachers' mathematics anxiety negatively relates to girl students' mathematics achievement [5].

Students with higher level of mathematics anxiety are found to have low achievement and confidence in mathematics subject [16]–[19]. The researches prove that students with a low level of mathematics anxiety have a tendency to perform higher than those with higher mathematics anxiety. They also indicated that students with a higher level of mathematics confidence performed extremely higher on mathematics examination than those with a higher level of mathematics anxiety and less confidence.

As presented in Table 1, previous research has shown that teacher behavior and speech can affect students' negatively in the classroom. In terms of behavior, poor conceptions as a pre-service teacher [20], [21], failure to expose real life applications of mathematical concepts [22], forcing memorization [23], [24], excessive level of anxiety among female teachers [25] can transfer feelings of mathematics anxiety among students [26]. In terms of speech, making derogatory remarks [27], poor explanations and embarrassing students [28], [29] and showcasing less confidence in themselves as teachers [30] can cause students to experience mathematics anxiety.

Table 1. Past findings about teacher behavior and speech that effect mathematics anxiety

Theme	Reference	Findings about teacher behavior and speech
Behavior	[20], [21]	Poor self-conceptions of a pre-service teacher
	[22]	Failure to expose the student to the real-life applications of some concept of mathematics such as vector, matrices partial and fraction
	[23], [24]	Forcing students to memorize mathematical concept without applications
	[25]	An excessive level of mathematics anxiety of female teacher affects girl students in the subject
Speech	[26]	Teachers can transfer their feelings of mathematics to their students
	[27]	Some teachers make derogatory comments to the student such as "how many times have I told you"
	[28], [29]	Poor explanations and embarrassing students when giving wrong answers
	[30]	Showcasing less confidence by saying a discouraging statement such as "I don't have deep knowledge of mathematics"

## 3. PROBLEM STATEMENT AND RESEARCH OBJECTIVES

Zalmon and Wonu [31] stated that mathematics is a pre-requisite for admission into science-related subjects and technology-based courses in Nigeria. However, it is a regulation in Nigeria education system that for one to be given admission into a university one, must have five credits passes in a related course of

study, with mathematics and English language inclusive. Emmanuel *et al.* [32] reported the disturbing evidence of poor performance of students in mathematics examinations at each level of education in Nigeria. This is in accordance with the annual report of the West African Examination Council (WEAC) of Sokoto State for 2013, 2014, 2015, and 2016 which saw the percentage of students with five credits, including mathematics with respective pass credit 7.12%, 7.18%, 16.84%, 29.37% and 31.85% out of total enrolment for these years. Feeling distressed with a higher level of mathematics anxiety is one of the contributing factors to the poor performance of mathematics examinations in both WEAC and the National Examination Council (NECO) in Nigeria [9]. NECO and WAEC are among the well-recognized examination bodies in Nigeria at the secondary level.

Mathematics is an important subject that has many applications in engineering, medicine technology and mathematics-related subjects [33]. Mathematics anxiety is a crucial issue in the area of mathematics education and is seriously affecting students' performance in Nigeria. Previous researchers have used primarily a quantitative approach to explore mathematics anxiety [28], [34]–[37]. More current researches [38]–[40] have sought the relationships between mathematics anxiety and other variables such as gender, mathematics self-efficacy and mathematical literacy. However, these researches still gathered data through a quantitative approach and have viewed them in terms of the manifestation of mathematics anxiety as opposed to sources of mathematics anxiety. This current study takes a different angle where it looks at one possible source of mathematics anxiety or teacher effects on mathematics anxiety, not only in how they intensify the anxiety among students, but also, what teachers do to minimize mathematics anxiety. This study will help the teachers and stakeholders to find the necessary solution to the disturbing and alarming situation of mathematics anxiety, especially in secondary schools in Sokoto State, Nigeria.

This study is aimed at: i) Identifying the level of mathematics anxiety among senior secondary school students in Sokoto state, Nigeria; ii) Identifying teacher effects in intensifying and minimizing mathematics anxiety from the students' perspectives in Sokoto state, Nigeria.

#### 4. RESEARCH METHOD

The study is mixed sequential explanatory research method. The quantitative part was carried out in the initial stage followed by the qualitative study. In the initial stage a survey called cognitive, emotions, physical-mathematics anxiety rating (CEP-MAR) was developed by the researchers. This survey consisted of twenty items that measured students' mathematics anxiety on a five-point Likert scale. The instrument developed was checked for content validity by two experts and changes to the wording of the questions as suggested by the experts. A pilot study was also conducted beforehand where the survey was distributed to 30 students. The reliability score from the pilot study is 810.

In the actual study, the questionnaire was distributed to 109 secondary school students in a school in Sokoto State, Nigeria and 102 were returned. CEP-MAR survey had several some positive items. The positive items were reversed before analyzing the data. The level of mathematics anxiety of each participant was analyzed by summing up the score of each of the 20 items and their percentages were calculated. Zakaria and Nordin [18] categorized mathematics anxiety score into three groups, namely: low, moderate, and high respectively using percentile. Mathematics anxiety means-score range between 33% and 67% are considered to be a moderate group. The low and high anxiety groups are 33% above and below the moderate group. This categorization was used in order to determine the level of mathematics anxiety of the respondents.

The intention of the survey was to sift through the sample and filter those who have low, high and moderate mathematics anxiety. The respondents with high mathematics anxiety were selected for a photovoice project because it is assumed that they will capture more incidents that caused them mathematics anxiety as compared to those with moderate or low mathematics anxiety. The selection of the 20 participants were of those with high mathematics anxiety and were willing to partake in the photovoice project.

Photovoice is a participatory action research approach that enables the individual to take photos to identify and address the problem in their society with help of interview from the images captured [41]. It is a qualitative research approach of collecting data through the use of photographs and in-depth interview to identify, represent and analyze some particular issue in a certain community. Photovoice permits researchers from different research area to visualize individual perception of everyday life reality [42], [43] also stated that photovoice helps participants to express their perception and facilitates crucial issues around their area of interest-which in this case is mathematics anxiety. Photovoice is a way of exploring information, behavior and authentic participant expression and a unique method that uses photographs as a research strategy [44].

The participants and the teacher who would be the focus of the students in the project gave verbal informed consent to participate in the project. They were assured that their identities would remain anonymous and the photos taken will also be edited to not reveal the true identities of the people involved. They were also told they could opt out from the study at any time. The teacher was also willing to participate in the project because he felt it would help him improve his teaching practice. Before the commencement of

the photovoice project, a session was held with the students to explain to them what is meant by mathematics anxiety, how to handle cameras, and what to do if they felt the mathematics anxiety materialized in them. They were also given the opportunity to ask questions. The students were given the freedom to capture the photos on their own and no clues or guideline given to them on the expected output.

In the photovoice project, the students were asked to capture photos in the classroom of events that heightened or reduced their mathematics anxiety. In this case, the teachers' behavior and speech. Right after each class session, one on one semi-structured interview was conducted with the participants to discuss the photos gathered. Table 2 and Table 3 show the questions and their intention during the interview session to determine students' anxiety symptoms and the causes from the teacher that intensify or minimize mathematics anxiety.

The photovoice project took about four weeks to complete. The interview data was arranged according to teacher speech and teacher actions and identified symptoms with NVivo software packages. They were then coded according to similar words used. For example, the students reported the teacher saying they were 'lazy', 'unserious', 'not wise and not intelligent' and this was coded under 'embarrassing students' which appeared six times throughout the interview transcript. All the interview transcript was analyzed in the same way and several codes from the themes of teacher actions and speech and mathematics anxiety.

Table 2. Photovoice interview questions regarding teacher intensifying mathematics anxiety

Interview question	Intention
What can you see here?	To begin talking about the photo selected by the student
How did you feel when you took the photo?	To elicit students emotional, cognitive and physical symptoms of mathematics anxiety.
What did the teacher say or do to make you feel that way?	To elicit teacher behavior or speech that intensify mathematics anxiety.

Table 3. Photovoice interview questions regarding teacher minimizing mathematics anxiety

Interview question	Intention
What can you see here?	To begin talking about the photo selected by the student
How did you feel when you took the photo?	To elicit students emotional, cognitive and physical symptoms that reduced mathematics anxiety.
What did the teacher say or do to make you feel that way?	To elicit teacher behavior or speech that minimizes mathematics anxiety.

## 5. RESULTS AND DISCUSSION

### 5.1. Respondent demography

Table 4 shows the gender and age distribution of the respondents 55.9% of the respondents are male and 44.1% respondents are female. Meanwhile, 12.7% of the respondents were aged between 15-16, 29.4% respondents were aged between 16-17, while the majority (57.8%) of respondents were aged between 17-18. It should be informed that in Nigeria, in one school year, there may be a variation of ages as students start and resume school when they have the financial resources and means for their education.

Table 4. Gender and age distribution of survey participants

Variable	Frequency	Percentage (%)
Gender	Male	57
	Female	45
	Total	102
Age	15-16	13
	16-17	30
	17-18	59
	Total	102

### 5.2. Level of mathematics anxiety

As shown in Table 5, only one (1.0%) respondent had low mathematics anxiety, while 42 (41.2%) respondents had moderate mathematics anxiety. The majority, 59 (57.8%) had high mathematics anxiety. Nigerian students perceive that mathematics is a difficult subject and this negative attitude contributes to the unnecessary mathematics anxiety [35]. It is very common for Nigerian students to declare his or her lack in mathematics. Nigerian students experience strain and stress due to their mathematics anxiety and these generally impacts on their cognitive and intellectual ability [32].

Table 5. Level of mathematics anxiety of the respondents

Level of mathematics anxiety	Number of participants	Percentage (%)
Low	1	1.0%
Moderate	42	41.2%
High	59	57.8%
Total	102	100%

### 5.3. Teacher speech and behavior that intensify mathematics anxiety

Figure 1 shows the photo exhibit and Table 6 shows the interview excerpt and the associated coding conducted in relation to the photo exhibit. Meanwhile, Table 7 shows the overall the findings of the teacher factor in intensifying mathematics anxiety in terms of behavior, speech and identified symptoms. Subcategories emerged in terms of behavior with their respective percentage of responses, these include: going too quickly in the mathematics lesson (6.90%), giving too many notes (13.80%), giving too many exercises (10.34%), moody behavior of the teacher (10.34%), giving too much punishment (31.04%), using poor teaching aids (10.34%), putting too many students in mathematics class (6.90%), and ignoring the slow learners (10.34%). These are the major factors that intensify mathematics anxiety in secondary schools in Sokoto state. This is similar to the previous findings [13] that students' anxiety in mathematics is as a result of teachers' negative behavior and the learning environment.

Whyte and Anthony [10] highlighted that mathematics anxiety comes from teaching and mathematics teachers. Therefore, teaching style and teacher behavior have a significant role in creating fear in the subject. In addition, there are other factors that emerged in the Nigerian context, which include too much punishment in mathematics classroom whereby the learners were terrorized with different types of punishment, such as beating them with a cane, and forcing them to kneel down in front of their peers. The second factor as stated by the respondents are giving too many mathematics notes in the mathematics classroom whereby the teacher would give notes before explanations which go a long way to make the lesson uninteresting and teacher-centered.



Figure 1. Photo exhibit 1

Table 6. Photovoice interview excerpt and analysis

Speaker	Transcript	Coding
Interviewer	What can you see here?	
Student	Our teacher	
Interviewer	How do you feel when you took the photo?	
Student	<u>Frustrated and not happy because our teacher is so harsh</u>	Physical symptom: frustrated Emotional symptom: not happy Moody behavior of teacher: our teacher is so harsh
Interviewer	What did the teacher say to make you feel that way?	
Students	<u>Our teacher is saying we are not serious, some of us are not good in simple mathematics and he is going to punish us because of our poor performance in math.</u>	Discouraging or terrifying statement: saying we are not serious, not good in simple mathematics. Giving too much punishment: he is going to punish us.

Table 7. Analysis of emerged subcategory on teacher intensifying mathematics anxiety

Themes/categories	Codes	Examples of excerpts	Percentage of responses
Teacher intensifying mathematics anxiety in terms of behavior	Over speeding in a mathematics lesson	The teacher is going very fast	2 (6.90%)
		The teacher is going too fast	
	Giving too many notes in a mathematics lesson	The teacher, the way he gives us notes is much, I am not understanding	4 (13.80%)
		Giving us too much notes	
		Giving us note after note thinking we understand	
		Giving us many notes before the explanation	
	Giving too many much exercises	Giving us a lot of exercises to do at home	3 (10.34%)
		Too many exercises	
	The moody behavior of the teacher	Sometimes he can easily be unhappy	3 (10.34%)
		Our teacher is so harsh	
	Giving too much punishment	Punish us because of our poor performance in math.	
		Biting us with a cane if we didn't answer the mathematics activity correct.	9 (31.04%)
		My teacher us always coming with a cane and make me scared and unhappy.	
		Our teacher is giving us punishment.	
		Beating us with that stick if we make noise.	
		Beating. If we don't answer his question correctly.	
Punishment if we are wrong.			
Too much punishment.			
Using poor teaching aids	The blackboard our teacher is using is not very clear	3 (10.34%)	
	The blackboard our teacher is using is not clear.		
Putting too many students in a mathematics class	We are many in the class.	2 (6.90%)	
	The classroom he is using there is no good breath and is not good for me to learn math.		
Ignoring the slow learner	Not asking me in class.	3 (10.34%)	
	Always consider me as a dull.		
	Only asking the good ones in mathematics		
Total			29 (100%)
Teacher intensifying mathematics anxiety in terms of speech	Embarrassing	Anyone that is performing not well in mathematics is not wise and intelligent.	6 (30%)
		Saying I am very lazy and unable to solve the even small exercise.	
		My teacher is always saying I am not correct and mathematics is not subject for lazy students	
		Saying I am dull in mathematics.	
	Discouraging statement/terrifying statement	Saying I am not performing well in mathematics.	14 (70%)
		My teacher is saying I am not good in math.	
	Saying I am not good in mathematics.		
Total			20 (100%)
Identified symptoms	Cognitive symptoms	No need to concentrate, I am totally out of my mind, not interested in mathematics lesson	9 (16.07%)
	Emotional symptoms	Hate the lesson, hate mathematics, not comfortable, nervous, sad, angry	31 (55.35%)
	Physical symptoms	I am not in good condition, I feel disturbed, sweating, totally in fear.	16 (28.58%)
Total			56 (100%)

In terms of speech with their respective responses, the findings revealed that the majority of the respondents stressed the fact of discouraging/alarming statements such as: “only intelligent students can understand mathematics”, “mathematics is not a subject for lazy students”, “you are going to face punishment if you fail mathematics activities”, and “mathematics requires deep thinking skills”. These are deeply frightening statements that causes mathematics learners to dread mathematics. These types of statements, according to the respondents, are one of the factors contributing to their fear of mathematics. The finding can be supported by Jackson and Leffingwell [27] who stated some mathematics teachers make derogatory comments and some exhibit anger when a student needs more clarification. Also consistent with previous study [45], a low expectation of students can lead to the poor performance of students in mathematics, thereby increasing the level of mathematics anxiety.

The findings furthermore revealed that embarrassing statements such as “I am dull”, “I am lazy”, “I am very unserious and lazy” are some of the factors that contribute to intensifying mathematics anxiety by the teacher. When a learner requires additional information in the course of providing an appropriate solution to a mathematics problem, it will become an obstacle if unwanted comments are made such as “are you dull?”, “how many times do I tell you?” [29]. These issues may lead to intensifying mathematics anxiety, which can easily cause a student to hate mathematics and develop less interest to be active in the classroom.

The symptoms identified from the teachers' intensifying mathematics anxiety with their respective percentage of responses include cognitive symptoms (16.07%), such as 'always worried', 'thinking no need to concentrate', 'totally out of my mind'. Emotional symptoms (55.35%) include 'not interested in a mathematics lesson', 'uneasy', 'not happy', 'feel bored', and 'nervous'. Physical symptoms (28.58%) are such as being 'totally confused', 'very scared', 'sweating' and 'very frustrated', among others. These are supported by the three symptoms related to mathematics anxiety which include physical, emotional and cognitive symptoms [10]. The most common reported mathematics anxiety symptom is emotional symptoms.

Mathematics anxiety is an emotional act related to the problem solving and mathematical thinking related to past negative experience of mathematics [13]. Generally, students tend to lose confidence and forget mathematics equations when having mathematics anxiety [34]. Likewise, some students become anxious when given pressure to solve particular mathematics tasks within a short period of time and some were afraid to ask during questions during lessons thinking that they are not intelligent questions [13]. The symptoms appear to cripple students' ability in mathematics and hinder the learning process.

#### 5.4. Teacher speech behavior that minimizes mathematics anxiety

Figure 2 shows the photo exhibit and Table 8 shows the related photovoice interview excerpt as well as the coding conducted in teacher minimizing mathematics anxiety. Meanwhile, Table 9 shows the emerged subcategories on teachers minimizing mathematics anxiety through behavior and speech. Various subcategories emerged in terms of behavior with respective percentages, including: giving competition/quiz (35.00%), using good learning facilities (10.00%), teacher consideration of slow learners (10.00%), and teachers' motivational support (45.00%). These were identified from the students' perspective to be the key factors that help in reducing the level of mathematics anxiety. This can be supported by Blazer [46] who stated that encouraging positive attitude, active learning and strong teaching skills can positively help the students to develop interest in the area of mathematics and minimize some level of mathematics anxiety. Kaufman [47] stated that teachers can help students to decrease the level of fear of mathematics by employing student-centered learning, constructivist teaching, concrete representation model and interactive class lesson. To reduce the level of mathematics anxiety, mathematics teachers should be motivated with positive attitude and teachers should avoid traditional way of teaching [35].



Figure 2. Photo exhibit

Table 8. Photovoice interview excerpt and analysis

Speaker	Transcript	Coding
Interviewer	What can you see here?	
Student	It's my teacher.	
Interviewer	How do you feel when you took the photo?	
Student	I feel interested in the lesson.	Cognitive symptom: Interested
Interviewer	What did the teacher say to make you feel that way?	
Student	He is encouraging us saying if we should work hard, we are going to understand math gradually if we are concentrating in the lesson.	Intrinsic motivational statement: work hard, we are going to understand math gradually if we are concentrating in the lesson.

Table 9 highlights the respondents' perception of the factors that minimize the level of mathematics anxiety in terms of teachers' speech. The responses were categorized into intrinsic and extrinsic motivational statement with their respective percentage responses. The intrinsic motivational statements (58.82%) include:

“you have started to understand mathematics”, “work hard, mathematics is simple”, and “you are going to understand”, while extrinsic (41.18%) includes saying “if you want to become an engineer, technologist or medical doctor you must have knowledge of mathematics”, and “anybody that scores a very good mark in the math activity will be given a gift”. This can lead to the reduction of mathematics anxiety in the secondary school mathematics classroom.

Taylor [14] argued that teachers should encourage intrinsic and extrinsic motivation in order to reduce the level of anxiety in mathematics. Motivation is the arousal of a tendency to act and produce one or more effect. Motivation is classified into two constructs, intrinsic and extrinsic. Intrinsic motivation is a motivation within the student; it involves the development of an internal drive in the learner. Extrinsic motivation is derived externally from the learner and it consists of motivational forces outside the learner and influences the learner to develop interest in mathematics in order to achieve a particular objective externally, as earlier highlighted in some previous examples. Blazer [46] also states that getting to know students, moral support and creating good atmospheric condition from the side of instructors can help in reducing mathematics anxiety.

The symptoms identified from the teachers’ minimizing mathematics anxiety and their percentage of responses include: cognitive symptoms (24.14%), such as ‘feeling interested’ and ‘motivated’ in the mathematics lesson; emotional symptoms (68.97%) such as ‘excited’ and ‘happy’, and physical symptoms (6.89%) such as ‘looking comfortable’ and ‘being in a good condition’. This is consistent with the categorization of mathematics anxiety symptoms into cognitive, emotional and physical [10] and can be seen as minimizing symptoms.

Table 9. Analysis of emerged subcategory on teacher minimizing mathematics anxiety

Themes/categories	Codes	Examples of excerpts	Percentage of responses
Teacher minimizing mathematics anxiety in terms of behavior	Giving competition/quiz	Our teacher is giving us quiz in our class and any group that gets the highest score will be given a gift.	7(35.00%)
	Using good learning facilities. Teacher consideration to the slow learners.	His board is clear and I am seeing clearly	2(10.00%)
		Our teacher asks me to solve mathematics problem and I got it right, I am very happy.	2(10.00%)
	Teacher motivational support	Today our teacher is not going very fast, I like it because I can understand a little bit.	
Total		Clapping for anyone who gets the right answer.	9(45.00%)
Teacher minimizing mathematics anxiety in terms of speech	Extrinsic motivational statement	Saying I am going to become a doctor or engineer.	20(100%)
		Saying mathematics is very simple.	7(41.18%)
		Any student that understands mathematics should help and teach his friend.	
	Intrinsic motivational statement	Saying if we work hard, we can understand math gradually.	10(58.82%)
Total		Saying he will try as much as he can to make sure everyone understands mathematics.	
Identified symptoms	Cognitive symptoms Emotional symptoms Physical symptoms		17(100%)
		Motivated to learn math, interested	7(24.14%)
		Feel happy, excited, feel good	20(68.97%)
		Feel comfortable, smiling	2(6.89%)
Total			29(100%)

## 6. CONCLUSION

The current study was conducted in order to explore teacher influence on mathematics anxiety among high mathematics anxiety students. However, several limitations could be observed. For example, the data gathered was in the Nigerian context which has special circumstances such as having mixed aged students and many students (above 40) in a class. Other than that, the photos captured were only during class time in teacher-centered learning approach. Therefore, the data gathered may be unique to this setting. Nevertheless, this study provides evidence that teachers can influence mathematics anxiety in the classroom. What teachers say and do in the classroom can have an impact on intensifying mathematics anxiety. Oppositely, teachers can also reduce mathematics anxiety among students by taking a few simple steps such as being encouraging, considering slow learners and creating a positive learning environment.

Answers from this study also raises further questions on other social factors that can influence mathematics anxiety such as parents, community role and the media in intensifying and minimizing mathematics anxiety. Future research could also look at the effects of using technology in the classroom on mathematics anxiety. Another possible future research that involves mathematics anxiety and photovoice is a



comparative study between the low and high mathematics anxious students and the photos they capture. This might help to uncover specific nuances and behavior that should be avoided by teachers and peers alike in order to help reduce mathematics anxiety among all students. A final photovoice study could look into how students manage their mathematics anxiety. Overall, there are many potential studies that could be conducted in the area of mathematics anxiety with and without the use of photovoice.

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