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## EFFECTIVENESS OF COGNITIVE RESTRUCTURING IN THE MANAGEMENT OF MATHOPHOBIA IN LUTAY INTEGRATED SCHOOL, PHILIPPINES

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### Abstract

This study investigated the effectiveness of cognitive restructuring in the management of mathophobia among Grade 8 learners enrolled in Lutay Integrated School during SY 2019-2020. One group was randomly assigned as the experimental group which was taught with cognitive restructuring techniques- counseling and positive reinforcement, while the other is the control group which was taught using the traditional method of teaching. Frequency, mean, percentage and t-test were used to analyze the data. Based on the results, students who were taught using cognitive restructuring decreased their mathophobia level than those students who were taught using the traditional lecture method. The students' views about the causes of mathophobia are hesitation, helplessness, bullying/inhibitions, teachers' teaching style, and difficulty of the subject. With these findings, the school administrators may encourage Mathematics teachers to utilize cognitive restructuring during their teaching to better enhance students' participation, and reduce the risk of mathophobia.

**Keywords:** Cognitive restructuring; Counseling; Lutay Integrated School; Mathophobia; Positive reinforcement

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### Introduction

Many of the learners in Lutay Integrated School declare that they found Mathematics as a difficult subject. In fact, this is one of the major dilemmas of their Mathematics teacher. Learners tend to think negatively when it comes to this subject. Even if the lesson has yet to start, the learners already feel uneasiness on their seats. With this, it becomes natural to every learner in Lutay Integrated School that the most difficult among the subjects in school is Mathematics. Mathophobia is a feeling of nervousness and pressure that interferes with the operation of numbers and problem-solving skills in a broader sense of life and academic situations (Perry, 2004). Now and even before, learning Mathematics is important and it is an inescapable aspect of life. Mathematics manages everything around us, and without a good understanding of it, a person can encounter significant problems in life.

Studies showed that Mathematics achievement in learners is influenced by psychological factors such as mathophobia. According to Arem (2009), mathophobia is an emotional, mental, and physical act related to the mathematical thinking and problem-solving processes which resulted from uncomfortable past experiences related to Mathematics especially in school. Learners who have bad experiences in the subject keep hold on those incidents which lead them to feel anxious during their Mathematics classes. Teachers, peers and parents are responsible for triggering phobia of Mathematics among students. If learners recognize that "Mathematics is difficult" during their early stage, Mathophobia will be triggered (Puteh, 2002). Research has shown that learners who are mathophobic do not perform well in their Mathematics class (Shores, 2005). Teachers want their learners to excel in class and that would give them assurance that they are effective as teachers. Thus, teachers seek for ways on how to improve the performance of their learners in class. It is one of the great challenges among teachers on how to motivate their learners and help them overcome their feeling of fear in the subject.

Cognitive restructuring has been used to treat a wide variety of conditions, including depression, Post-Traumatic Stress Disorder (PTSD), anxiety, social phobias, and stress. Cognitive restructuring is a behavioral technique associated with Cognitive Behavioral Therapy (CBT). CBT is based on the idea that how we think (cognition), how we feel (emotion) and how we act (behavior) all interact together. Specifically, our thoughts determine our feelings and our behavior (McLeod, 2015). CBT aims to help people become aware of when they make negative interpretations, and of

behavioral patterns which reinforce the distorted thinking. Cognitive therapy helps people to develop alternative ways of thinking and behaving which aims to reduce their psychological distress.

As a Mathematics teacher, the researcher observed that learners are suffering from mathophobia which certainly affects their academic performance. Students perceive that Mathematics is boring and very difficult to understand, making them hate the subject and achieve low academic performance. And so, finding ways to reduce this mentality is considered necessary. Thus, this study would like to test the effectiveness of cognitive restructuring in the management of mathophobia in Lutay Integrated School. Mathophobia is a psychological dimension of learning that is vital for educators to recognize. It can greatly affect an individual's success throughout his education and in reaching his full potential. Since Mathematics is associated to so many professional practices, it is important that educators help learners to prevail over this crisis so they can learn Mathematics skills that they need to achieve something. Research has shown that Mathematics achievement in learners is influenced by psychological factors like mathophobia. Internationally, much research has been done to investigate the extent of mathophobia in schools (Mohamed & Tarmizi, 2010; Khatoun & Mahmood, 2010). Locally, researches were also made to determine the relationship between Mathematics anxiety and academic performance of students (Amigos, 2017; Hidalgo, 2016). However, in the researcher's locality, in the Division of Sarangani, specifically in East Malungon District, mathophobia is not yet investigated. Moreover, the researcher thought of the necessity to address this issue that is why this study has been made. The researcher investigated the mathophobia level of Grade 8 learners in Lutay Integrated School and proposed a possible solution to solve this incessant predicament through counseling and positive reinforcement.

## Materials and Methods

This study used the quasi-experimental design wherein it involved selecting groups by incorporating both quantitative and qualitative approaches. Before the start of the experiment, the researcher asked permission from the Schools Division Superintendent of Department of Education, Sarangani Division and the School Principal of Lutay Integrated School, Malungon, Sarangani Province. It involved the Grade 8 learners officially enrolled at Lutay Integrated School during the school year 2019-2020. Two intact groups were taken as samples in the study. One group consisting of 25 Grade 8 learners was randomly assigned as the control group and another group of 25 learners of the same year level was the experimental group. Both groups were composed of learners enrolled under a homogeneous class for the fair assessment of the study. Shown in table 1 is the distribution of the subjects.

**Table 1.** Distribution of the Subjects

<b>Subjects</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Control Group	<i>12</i>	<i>13</i>	<b>25</b>
Experimental Group	<i>14</i>	<i>11</i>	<b>25</b>
<b>Total</b>	<b>26</b>	<b>24</b>	<b>50</b>

### A. The Experimental Group

The experimental group consisted of 25 learners who have undergone cognitive restructuring, using individual counseling and positive reinforcement as treatment. To solicit advice and support, the learners underwent a focus group discussion (FGD) together with the researcher as method for counseling. The researcher re-interpreted the negative thoughts of students about Mathematics. After which, session meetings with the Mathematics teacher were done an hour daily from 2:00 p.m. to 3:00 p.m., Mondays to Fridays entailing positive reinforcement to motivate learners and ultimately boost their self-esteem. A 20-item pre-mathophobia level test was conducted before the experiment. The mathophobia level questionnaire used in this experiment was validated by professionals. The duration of the test was thirty (30) minutes. After 20 days of session meetings, a post-mathophobia level test was conducted to measure the effect of cognitive restructuring on the management of mathophobia of learners.

## B. The Control Group

The control group consisting of 25 learners was taught daily by the Mathematics teacher using the lecture method of teaching. No counseling was done. The same with the experimental group, pre-mathophobia level test was administered for thirty (30) minutes, followed by a post-mathophobia level test after the 20 meetings. The study was conducted from October 2019 to December 2019.

### Research Instrument

On the conduct of the study, the researcher used two instruments- the counseling form guide questions, and the pre/post-mathophobia level test questionnaire.

**Pre/Post-Mathophobia Level Questionnaire.** Adapted questionnaire from Suinn and Winston (2003) was used in this study. It was revised by the researcher and it underwent two validation processes, the reliability and validity test done by Master Teachers in the field of Mathematics. Based on the reliability test, the Mathophobia Level Questionnaire is Highly Reliable as shown by the Cronbach's alpha value of *0.801*. Thus, the questionnaire can be used as a reliable instrument to measure students' mathophobia level. Consequently, the validity test showed that the questionnaire is Highly Valid with the mean value of *4.77* which denotes that it can provide unbiased data, allowing 6-10% error only.

Some demographic profiles of the subjects were also included in the questionnaire. The questionnaire was composed of 20 situations. It was distributed to the experimental group and the control group upon and after the application of teaching methodologies. The subjects were asked to rate each statement using a five-point Likert scale. The Mathophobia levels of the Grade 8 learners were evaluated using the following intervals with the corresponding descriptions.

Mean Range	Description	Interpretation
4.50 – 5.00	Very High Anxiety	The Anxiety was manifested at a very high level
3.50 – 4.49	High Anxiety	The Anxiety was manifested at a high level
2.50 – 3.49	Moderately High Anxiety	The Anxiety was manifested at a moderately high level
1.50 – 2.49	Low Anxiety	The Anxiety was manifested at a low high level
1.00 – 1.49	Very Low Anxiety	The Anxiety was manifested at a very low level

**Interview Guide.** During the interview or focus group discussion, the researcher used a counseling form guide. The counseling guide consisted of five (5) open-ended questions that were asked to the learners. The learners underwent individual counseling and solicited advice and support from the researcher as method for counseling. The researcher re-interpreted the negative thoughts of the students about Mathematics. Confidentiality of the discussion was honestly ensured.

The method of data collection was done in four phases. Firstly, the pre-mathophobia levels of the two groups were established as equal or homogeneous to ensure the fairness and non-bias of the results. Secondly, the pre-mathophobia level test was administered to both the experimental and control group at the start of the experiment. The results were tallied from 25 learners of each group who were randomly selected. On the third phase, both groups underwent different teaching approaches in Mathematics class. The experimental group experienced cognitive restructuring wherein focus group discussion (FGD) method as tool for counseling took place with the assurance of privacy. Also, positive reinforcement was integrated in the lecture. The fourth phase involved the evaluation of the treatment package and the entire procedure. The researcher administered the post-mathophobia level test and scores of the students were tallied to find out if there is a significant difference in the pre-mathophobia level and post-mathophobia level of each group. After this, the researcher expressed gratitude to the subjects for their cooperation throughout the conduct of the study.

To determine the pre-mathophobia level of the control group and the experimental group at the start of the study, mean, frequency count and percentage were used. To determine if there is a significant difference between the pre-mathophobia level of the experimental and control group, t-test for the independent samples was used. To determine the post-mathophobia level of the control group and the experimental group, mean, frequency count and percentage were used. To determine if there is a significant difference between the post-mathophobia level of the experimental

and control group, t-test for independent samples was used. To determine if there is a significant difference between the pre-mathophobia level and the post-mathophobia level of the control group, t-test for dependent samples was used. To determine if there is a significant difference between the pre-mathophobia level and the post-mathophobia level of the experimental group, t-test for dependent samples was used. All tests were done at the 0.05 level of significance.

## Results and Discussion

### Pre-Mathophobia Level of the Control Group and the Experimental Group

This study determined the mathophobia level of the Grade 8 experimental group and control group at the start of the study. To describe the results, frequency distribution and percentage were used. Shown in Table 2 are the results.

**Table 2**  
Pre- Mathophobia Level of the Control Group and the Experimental Group

Mean Range	Control Group		Experimental Group		Description
	F	%	F	%	
4.50 - 5.00	0	0	0	0	Very High Anxiety
3.50 - 4.49	11	44%	12	48%	High Anxiety
2.50 - 3.49	14	56%	13	52%	Moderately High Anxiety
1.50 - 2.49	0	0	0	0	Low Anxiety
1.00 - 1.49	0	0	0	0	Very Low Anxiety
Total	25	100%	25	100%	
<b>Over-all Mean</b>	<b>3.52 (High Anxiety)</b>		<b>3.53 (High Anxiety)</b>		<b>High Anxiety</b>

Based on Table 2, 14 or 56% from the control group while 13 or 52% from the experimental group got a score range of 2.50 – 3.49, verbally described as having Moderately High Anxiety. Also, 11 or 44% in the control group and 12 or 48% in the experimental group experienced High Anxiety in the Mathematics subject. None of the subjects in both groups got a range scale of Low Anxiety, Very Low Anxiety, and Very High Anxiety.

These results inferred that before the conduct of the experiment, the control group and the experimental acquired anxieties in Mathematics subject. This indicated that Grade 8 students of Lutay Integrated School, both control and experimental group, suffered from Mathematics anxieties also known as mathophobia. Wahid, Yusof and Razak (2014) examined whether Mathematics anxiety and attitudes among students in higher education have an effect on their academic achievement. They found out that students' performances depend on their level of Mathematics anxiety, which means that higher score in Mathematics anxiety causes lower score in Mathematics performance. Indeed, Mathematics anxiety can greatly affect the students' performance in the subject matter. It is therefore important to give emphasis on this predicament suffered by the students so as to better approach in the subject.

### Difference in Pre-Mathophobia Level of the Control Group and the Experimental Group

This study further determined the pre-mathophobia level of the Grade 8 experimental group and control group. To determine whether the subjects' mathophobia level in the experimental group and control group are equivalent before the experiment, t-test for independent samples was used. Table 3 shows the results.

**Table 3**  
Difference in the Pre-Mathophobia Level of Control Group and Experimental Group

Groups	N	Mean	t-value	p-value	Remark
Control	25	3.52	0.112	0.456	No Significant Difference
Experimental	25	3.53			
Mean Difference		0.01			

Based on the t-test results, the control group got a pretest mean score of 3.52 while the experimental group got a pretest mean score of 3.53. The mean difference between the two groups is 0.01. Using t-test for independent samples, the mean difference produced and obtained a t-value of 0.112 and a p value of 0.456. Since  $p > .05$ , this shows that the mean difference is not significant. This also shows that before the experiment, statistical abilities of the two groups of subjects had no significant difference. This failed to reject the null hypothesis that there is no significant difference in the mathophobia level of the experimental group and the control group at the start of the study. The result implies that at the start of the experiment, both groups have a comparable level of Mathematics anxieties. Thus, there is no bias in the grouping of students in two groups and the experiment can be conducted with the premise that the two groups are equivalent in their initial mathophobia level. Based on the result, Mathematics anxiety in both groups is very common. Mathematics more than any other subject, stimulates anxiety and avoidance to students (Shores, 2005).

### Post-Mathophobia Level of the Control Group and the Experimental Group

This study determined the mathophobia level of the Grade 8 control group and experimental group at the end of the study. To describe the results, frequency distribution and percentage were used. Shown in Table 4 are the results.

**Table 4**  
Post-Mathophobia Level of the Control Group and the Experimental Group

Mean Range	Control Group		Experimental Group		Description
	F	%	F	%	
4.50 - 5.00	0	0	0	0	Very High Anxiety
3.50 - 4.49	12	48%	0	0	High Anxiety
2.50 - 3.49	13	52%	4	16%	Moderately High Anxiety
1.50 - 2.49	0	0	21	84%	Low Anxiety
1.00 - 1.49	0	0	0	0	Very Low Anxiety
Total	25	100%	25	100%	
<b>Over-all Mean</b>	<b>3.47</b> (Moderately High Anxiety)		<b>2.22</b> (Low Anxiety)		<b>Moderately High Anxiety</b>

Based on Table 4, 13 or 52% from the control group experienced Moderately High Anxiety while 12 or 48% experienced High Anxiety in the Mathematics subject. On the other hand, 21 or 84% of the subjects in the experimental group had Low Anxiety level and four (4) or 16% only had Moderately High Anxiety. This just showed that at the end of the experiment, the experimental group showed positive effect in the use of cognitive restructuring to reduce the anxiety level experienced by them. This is supported by Rajeev (2013) that by understanding and changing a person's belief, positive changes could be brought in and by changing thoughts and views, a change in behavior and positive responses can result.

### Difference in Post-Mathophobia Level of the Control Group and the Experimental Group

To determine whether the respondents' mathophobia level in the experimental group and control group differ at the end of the experiment, t-test for independent samples was used. Table 5 shows the results.

**Table 5**  
Difference in the Post-Mathophobia Level of Control Group and Experimental Group

Groups	N	Mean	t-value	p-value	Remark
Control	25	3.47	-12.030	0.000	With Significant Difference
Experimental	25	2.22			
Mean Difference		1.25			

Based on the t-test results, the control group got a post-test mean score of 3.47 while the experimental group got a post-test mean score of 2.22. The mean difference between the two groups is 1.25. Using t-test for independent samples, this mean difference produced and obtained a t-value of  $-12.030$  and a p-value  $< 0.000$ . Since  $p < .05$ , this shows that the mean difference is significant. These results indicated that the mathophobia level of the experimental group diminished with the use of cognitive restructuring. This resulted to the rejection of the null hypothesis that there is no significant difference between the post-mathophobia level of the experimental group and the control group. The result of this study supports the findings of Asikhia (2014) that cognitive restructuring strategy was effective in Mathematics anxiety management among students in Ogun State.

#### **Difference in the Pre-Mathophobia Level and the Post-Mathophobia Level of the Control Group**

To determine whether the respondents in the control group decrease its mathophobia level using the traditional method of teaching, t test for dependent samples was used. Table 6 shows the results.

**Table 6**  
**Difference in the Pre-Mathophobia and Post-Mathophobia Level of the Control Group**

Variables	N	Mean	t-value	p-value	Remark
Pretest	25	3.52	$-0.360$	$0.724$	<b>No Significant Difference</b>
Posttest	25	3.47			
Mean Difference		$0.05$			

Based on the results, the pretest mean score of the respondents is 3.52 and the posttest mean score is 3.47. This resulted to a mean difference of 0.05. When testing the difference using t-test for dependent samples, the resulting t value is  $-0.360$  and p-value of 0.724. Since  $p > .05$ , then the difference is not significant. This means that we fail to reject the null hypothesis that there is no significant difference between the pre-mathophobia level and the post-mathophobia level of the control group.

Without a doubt, the mathophobia felt by the students upon and after the conduct of the study did not differ with the use of traditional teaching methodology. The control group was taught using the traditional method of teaching wherein the teacher talks most of the time. Lesser motivation was applied and no counseling was directed to the students. The result showed no difference prior and after the conduct of the study in the control group. This may be because many students are less motivated to like Mathematics and perform no progress at all (Moore, 2012). This is supported by Finlayson (2014) that traditional teaching methods can cause and increase Mathematics anxiety in the classroom.

#### **Difference in the Pre-Mathophobia Level and the Post-Mathophobia Level of the Experimental Group**

This experimental study further determined the significant difference in the pre-mathophobia and post-mathophobia level of the respondents under the experimental group. To do this, t-test for dependent samples was used. Table 7 shows the results.

**Table 7**  
**Difference in the Pre-Mathophobia and Post-Mathophobia Level of the Experimental Group**

Variables	N	Mean	t-value	p-value	Remark
Pretest	25	3.53	$-11.330$	$0.000$	<b>With Significant Difference</b>
Posttest	25	2.22			
Mean Difference		$1.31$			

Based on the results, the pretest mean score of the respondents is 3.53 and the posttest mean score is 2.22. This resulted to a mean difference of 1.31. When testing the difference using t-test for dependent samples, the resulting t value is  $-11.330$  and p-value of 0.000. Since  $p < .05$ , then the difference is significant. These results indicated that the mathophobia level of the respondents decreased with the use of cognitive restructuring. This resulted to the rejection



of the null hypothesis that there is no significant difference between the pre-mathophobia level and the post-mathophobia level of the experimental group. This is supported by the study of Sunitha and Muhammedunni (2013) in academic procrastination in Mathematics that for a student to be able to confront his behavioral problem in the subject matter, there is a need for counselors to help him in examining himself. Also, Wang et al., (2015) showed that Mathematics motivation moderates the patterns of relation between Mathematics anxiety and Mathematics performance. Motivation helps students arouse their interest in the subject and this leads them to boost their self-confidence. Hence, with the use of counseling and positive reinforcement as cognitive restructuring techniques, the anxiety felt by the students in Mathematics subject may be overcome and it is important that educators help the students prevail over this crisis to solve this incessant predicament through counseling and positive reinforcement.

### Students' Views about the Causes of Mathophobia

This study also presented the results of collected data of the study through a focus group discussion (FGD) as a tool for counseling. The data were analyzed and interpreted based on the intent of the interview guide. There are issues and challenges encountered by the students that cause the development of their mathophobia. These are hesitation, helplessness, bullying/inhibitions, teachers' teaching style, and difficulty of the subject. The informants of this study were the Top Five (5) High Anxious learners during the conduct of Pre-Mathophobia Level Test under the experimental group. In order to conceal the identity of the researcher's informants, they are presented using the following code names: S1, S2, S3, S4, and S5.

The first research question inquired students if they are afraid when being called by the teacher and what do they feel about it. The responses of the five subjects were all alike. All of them were afraid when being called by the teacher to answer on the board. They are afraid as they thought they will not be able to answer the problem properly. The theme that emerged from the analyzed data is hesitation to participate in class recitation.

**Hesitation.** We are now living in an age that learners will soon be competing with young people from all parts of the globe for jobs and it is essential that our learners have developed positive outlook towards Mathematics and Science to become technologically oriented. Thus, learning to appreciate Mathematics is essential in today's generation. S1 said that she is afraid when called by the teacher. She is hesitant to stand because she knew that she will just give a wrong answer. During the interview and counseling, it was learned that learners tend to hesitate to participate in class discussion during Mathematics class especially when called by the teacher or having a class recitation because naturally it is inculcated in their minds that Mathematics is a difficult subject. Although Mathematics course has been introduced since their kindergarten time, solving basic Mathematics questions is still a problem to many learners in higher level institutions. The entire negative thinking contributed to mathematical anxiety (Wahid et al., 2014).

The informants were hesitant when being called by the teacher to answer on the board. They were hesitant as they thought they will just give an incorrect answer to the question. But even though they were hesitant to stand and answer on the board, they just followed the instruction of the teacher to go to the front and show their answers to the class. As teachers, it is a natural scheme for us to call for students to answer on board to check if they have understood the lesson and how far they have learned from our discussion. The informants clearly have negative thinking towards Mathematics as basis for their mathophobia. In order to help students cope with this crisis, teachers need to work with school counselors and to act as psychologist or counselors themselves to help lower or overcome such anxiety toward Mathematics among their students (Furner, 2017).

The second question wanted to find out if they had any trouble in solving Mathematics problem situations and what they did to answer such problem. The theme that emerged from the analyzed data is helplessness. As observed from all the responses of the informants, they seemed to experience trouble in solving Mathematics problem situations in different circumstances.

**Helplessness.** Good feeling towards Mathematics brings good perception about Mathematics, and vice versa. When students view Mathematics as a difficult subject, their emotions affect their way of thinking. They generalize every situation they get in. The informants felt that they were unable to do something when they had a quiz. S1 alleged that she was not able to answer the quiz because she became rattled. She did not know what to do, she was helpless. According to Wondimu, Alexander, Hans and Greetje (2012) in their study, the uneasy feeling such as panic, cluelessness and helplessness when working on something related to Mathematics tend to affect the mathematical performance especially for learners. Emotions play the most important part in this situation. Learners must be able to

control their emotions whenever given a Mathematics problem. In order to do this, teachers must be there to guide learners for them to feel relaxed in Mathematics class. As Rajeev (2013) cited that by understanding and changing the person's belief, positive changes could be brought in. Accordingly, by shifting feelings and outlook towards Mathematics subject, there could be change in actions, and behavior and positive responses may be produced.

The third question wanted to uncover if the informants experienced being embarrassed in their Mathematics class. The theme that materialized from the analyzed data was their inhibitions due to embarrassing experience. The informants were in consensus when asked if they experience being embarrassed in the classroom. All of them confirmed to have an embarrassing experience in Mathematics class especially when asked by the teacher or having a quiz.

**Bullying/Inhibitions.** With regard to learner-learner relationships, bullying has been viewed as a major threat in creating a safe school environment as mentioned by Luiselli, Putnam, Handler and Feinberg (2005). S2 and S5 just proved that it is a reality in Lutay Integrated School that bullying takes place. Students feel embarrassed when they experience bullying from their classmates or peers. This abuse and mistreatment to learners lead them to develop their inhibitions. Inhibitions are nervous feelings that prevent the learners to express their thoughts, emotions, or desires. S5 suffered from inhibitions because her seatmate bullied her due to her performance during their quiz. This may lead to the anxiety she felt towards the subject matter. Students recall every time about the incident that they were bullied. This made them feel afraid to participate or get a wrong answer and even get a low score in Mathematics class. According to Kibriya, Xu and Zhang (2015), it is possible that a student has a lower academic performance because he/she is a victim of bullying, or the likelihood of a student being bullied is higher due to worst academic performance itself. With the evidence that involvement in bullying affects children's mental and physical health, children who experience physical, verbal, or psychological abuse by their peers are at risk for various forms of psychological distress, including depression (Rigby, 2000), anxiety (Kaltiala-Heino, Rantanen, Rimpela & Rimpela, 2000), and loneliness (Boivin, Hymel & Hodges, 2001). It is then true that once a student suffers from bullying physically or emotionally in class or in school, he may suffer from inhibitions and may actually experience anxiety.

Students are troubled to make mistakes because they knew that these mistakes would eventually lead them to suffer inhibitions. Hersh and John-Steiner (2010) argue that people are not born hating Mathematics, but rather, learn to hate it through their experiences in school. Learners are afraid to make mistakes because they are anxious of getting bullied by their classmates preventing them to participate in Mathematics class. The National Council of Teachers of Mathematics (NCTM, 2000) believes that students should be exposed to numerous and varied interrelated experiences that encourage them to value Mathematics. To develop mathematical habits of the mind, they should be encouraged to guess, read, write, make conjectures and make errors so that they can gain confidence to solve complex problems. It is important that students should know that it is acceptable to make mistakes in Mathematics. In fact, mistakes make them learn. Educators should know that not all students are alike. But all should have equal opportunities in the classroom and that includes making mistakes.

The fourth question that the researcher wanted to know is if the informants had any conflicts or issues with their previous Mathematics teachers and how they resolved it. The theme that emerged from the analyzed data is student's misunderstanding towards the approach of teachers. Three among the five informants positively confirmed that they did not have any conflict or issues with their previous Mathematics teachers while the two of them experienced conflict or issues with their previous teachers.

**Teachers' Teaching Style.** Much influence relies in the hands of the teachers. Furner and Berman (2003) believe that educators need to take a role in encouraging students become active in class and to become excited about Mathematics and see themselves as doing well and confident mathematical problem solvers. Teachers need to remain attentive of and be insightful to the self-esteem of their frail students. S3 felt that he had conflict with his Mathematics teacher because he was scolded. But in this scenario, where he did not submit his project on time, the teacher just wanted S3 to submit the requirement for him to pass the subject. The teacher was just being considerate and S3 misunderstood his teacher for scolding him. Misunderstanding occurs when wrong tone of voice was used. It is important to note that teachers should know how to choose words carefully and deliver them in a gentle and loving manner especially to those fragile learners. The school is the second home of every learner; hence, much influence on learners are at the hands of their teachers. As a result, teachers should carefully look at the delivery methods and teaching styles and their effects on student anxiety. Shores (2005) believes that in addition to the help and support from the child's family, teachers can help chip away at this block by helping the student approach Mathematics with confidence. According



to Aarnos and Perkkila (2012), Mathematics anxiety can be caused by environmental factor. They stated that negative experience with parents or teachers in viewing mathematical concepts could lead to negative thoughts about the subject. This finding was supported by Maryam, Rohani and Sahar (2010) that students with mathematical attitudes, such as trying to avoid Mathematics course, might affect their attitudes and belief in Mathematics. This is why student-teacher relationship is important in the classroom because students who have caring and sympathetic teachers may suffer less from mathophobia and perform positive performance in class. Hattie (2008) supported this idea that positive-learner teacher relationship is associated to higher learner achievement. Furthermore, Maulana et al., (2011) claimed that teacher-learner interpersonal behaviors, influence and proximity were significant factors of existing learners' motivation. In order for a learner to be motivated to go to school, he must have a good relationship towards his teachers.

The last question was aimed to distinguish other factors the students thought that contribute in the development of their mathophobia. The theme that came out from the analyzed information was students' perception beforehand that Mathematics is a difficult subject; thus, making them hate the subject.

**Difficulty of the Subject.** Students' perception that Mathematics is difficult leads them to hate the subject. Students think naturally that Mathematics is not easy to handle. S3 and S4 said that they found Mathematics as a difficult subject. S3 felt dizzy to see large numbers and S4 felt nervous when seeing large numbers. The feeling that Mathematics is difficult is frequently developed in the classroom as a result of learners' negative experiences when learning Mathematics. Akinsola et al., (2007) found out that learners refer to Mathematics as being difficult. Shores (2005) further asserted that an anxious Mathematics learner, convinced of his inability to do Mathematics, might avoid the subject or will not put effort on it, leaving gaps in his development. The anxiousness felt by the students towards the subject is because of their feeling of difficulty and in return, their feeling of difficulty towards the subject matter resulted to the development of their Mathophobia. According to Wondimu et al., (2012), by treating Mathematics anxiety, learners are able to control their emotions since emotional factor is the most important factor related to Mathematics anxiety. The informants perceive Mathematics as a difficult subject. They find it complicated to see huge numbers. As their feeling of difficulty increases, they have a tendency to avoid Mathematics and eventually develop mathophobia. It is therefore important to elucidate to students that Mathematics is not that difficult after all.

In using counseling method as one of cognitive restructuring techniques in this study, the primary goal of the counselor is to assist the students bring beneficial changes and generate a good outcome like positive behavior change and promote decision making through refuting their irrational ideas and replace them with rational ones. In summary, the themes that emerged from the analyzed data about the issues and challenges encountered by the students that cause the development of their mathophobia are: hesitation, helplessness, bullying/inhibitions, teachers' teaching style, and difficulty of the subject.

## Conclusion

Based on the findings, the following are the conclusions:

1. The employment of cognitive restructuring is effective in the management of mathophobia.
2. There was no variation in the mathophobia level of the control group and the experimental group at the start of the study.
3. There is no significant difference in the pre-mathophobia level of the control group and the experimental group.
4. There is a significant difference in the post-mathophobia level of the control group and the experimental group.
5. There is no significant difference between the pre-mathophobia level and the post-mathophobia level of the control group.
6. There is a significant difference between the pre-mathophobia level and the post-mathophobia level of the experimental group.
7. Students' views on the causes of the development of their mathophobia are hesitation, helplessness, bullying/inhibitions, teachers' teaching styles, and difficulty of the subject.

Based on the findings of this study, it can be concluded that using cognitive restructuring techniques could decrease the mathophobia experienced by the learners. Their mathophobia level decreased after the application of counseling and positive reinforcement in the teaching and learning process. Their negative implications towards Mathematics were changed into affirmative approach. Students learn to feel at ease and cared for in a friendly classroom environment where they can rely on their teachers without their feeling of hesitation. Hence, the uses of counseling and positive reinforcement as cognitive restructuring techniques are found to be effective.

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