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An Investigation oif the Levels of Mathematics Anxiety n BA ISAGO Foundation Students

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Abstract

This research attempts to investigate the levels of mathematics fear, popularly known as mathematics anxiety in BA ISAGO University College (BIUC) students. The students are registered for various modules that include financial mathematics and quantitative methods as well as other mathematics related subjects such as Economics and Accounting. In their first sitting in November 2013, the majority of the students, constituting about 95%, failed the financial mathematics module, some scoring as low as 5%. This trend repeated itself in 2014 with indications that the same would manifest again in 2015 and beyond. This has prompted the current research to be urgently undertaken in order to try and investigate the causes of this high failure rate. Preliminary and informal discussions with the affected students have revealed that they generally have a phobia for mathematics. They also indicate that their phobia for the subject developed way back in high school and even in primary and pre-schools. This research therefore asks the question "What makes these students fear mathematics?"
The methodology for this study involves soliciting information/data from students pertaining to mathematics anxiety inherent in them. 255, three-section questionnaires were administered during class time. The analysis of the results have shown that (1) the majority of students (79%) scored grades C and D at high school, a not too desirable result for students embarking on a Bachelor's degree in Commerce; (2) most students (81%) attended Government High Schools and (3) there were mixed feelings on how mathematics was "*hard"* (48%) or "*easy"* (14%) as well as those who "*cannot tell*" (38%). The implications for further study are also discussed.

Keywords: BA ISAGO University College; Math Anxiety; Mathematics.

Introduction

Many studies have shown that students have a general fear for mathematics as evidenced by the low marks they score in tests and examinations and at BA ISAGO University College (BIUC) this problem in not uncommon. Students have declared openly that they fear mathematics or any subject that deals with numbers. The most disturbing element of this grim situation is that students do not show signs of having gone through a high school course in Mathematics. In Botswana, high school means Form 5. At the University of Botswana (UB) for instance, experience has shown that some students do not perform quite well in quantitative methods, statistics and mathematics (Nyakudya, 2011).

From the past several semesters, there is ample evidence stemming from students' performance in mathematics and mathematics related modules that there is great apathy when it comes to solving problems in these subjects. Students have performed very poorly even in mathematical problems involving the simple number line, addition, subtraction,

multiplication and division which are supposed to be lower grade topics. These students, as lamented by, among others, Luo et al. (2009), experience mathematics disorder (MD) as well as suffering from mathematics anxiety (MA) due to concept difficulty. According to Fiore (1999), mathematics anxiety is noticed in students in the form of "panic, helplessness, paralysis and mental disorganization" as soon as they get into a mathematics class. In the same vein, McKee (2002:2) notes that the brain literally "fails" to process manipulations in mathematical problems due to this problem. Perhaps the study that pre-empts what BIUC students go through is that carried out by Durrani et al. (2009) when they described mathematics anxiety as a "feeling of tension" adding that it incapacitates the ability to perform mathematical calculations. They were carrying out a study to investigate undergraduates' mathematics anxiety and the ability of these students to develop numerical skills. In this vein, a question arises "Do students at BIUC take time or put an effort to develop their numeracy skills". Rossnan (2006) made a good observation that "mathematics anxiety greatly affects a child's success" through to adulthood. Although far from the realm of childhood, the questionnaire for this current research attempts to emulate this thought by seeking for the immediate past high school grades of the current BIUC students undertaking some mathematical subjects in their study.

On account of the fact that mathematics anxiety remains a concern for students, for the school, for parents and for education in particular, this study makes an attempt to investigate (1) what mathematics anxiety really is, (2) its signs of occurrence, (3) its causes and effects and, most important, (4) how to eradicate it.

Objectives

The principal objective of this study is to investigate the levels of mathematics anxiety in BA ISAGO foundation students.

In order to achieve this main goal, the following specific objectives have been suggested:

1. **To scientifically define mathematics anxiety.**
2. **To investigate the main causes of mathematics anxiety.**
3. **To discuss the occurrence of mathematics anxiety.**
4. **To explore the strategies that can be employed in order to eradicate the problem on mathematics anxiety.**

Research Questions

To address these objectives, research questions are as follows:

1. **What is mathematics anxiety and what are its features?**
2. **What are the common causes of mathematics anxiety?**
3. **Where is mathematics anxiety found?**
4. **What strategies can be employed in order to reduce mathematics anxiety or to eradicate it completely?**

Limitations

The results of this study are intended to be utilized in generalizing for the entire population of Botswana but the sample is only 255 and may be inadequate to accomplish this intention. Other major hindrances at the moment are limited time, lack of funding and lack of human resources that could be deployed to collect data from a larger population. There is the need to make this study a full-scale one covering the whole country as the problem remains a major concern which needs redress.

Review of Literature

This literature review is meant to put this study into proper perspective; it helps researchers to address the research objectives, to answer the research questions and to aid in the creation of the research instrument whose contents are solely obtained from previous works. The literature search map traverses topical areas: definition of mathematics anxiety, prevalence of mathematics anxiety, causes of mathematics anxiety and strategies to curb mathematics anxiety. Old and new literature alike has been found to be quite relevant in this study.

Definition of Mathematics Anxiety

In defining mathematics anxiety, a relevant question arises: What is mathematics anxiety and what are its features? This question is answered by traversing the gamut of literature that has been recorded concerning the phenomenon.

In their definitions of mathematics anxiety (MA), several authors (for example Luo et al., 2009; Zackaria et al., 2007; Wigfield et al., 1988; Khartoon et al., 2010; Newstead, 1988; Noser et al., 2008; Chewning, 2002; Evans, 2007; Frillier, 2005; Wilson et al., 2006) have tended to strike a common vein that is premised on fear for and dislike of mathematics by many people whether in school or not. A snapshot survey involving a few students at BA ISAGO University College (BIUC) has seen students passing comments such as, among others:

"**I am not a mathematics person", "I fear mathematics" and "I hate numbers**".

These statements are consistent with several definitions of mathematics anxiety by many authors. For instance, Khatoon et al. (2010) defines the phenomenon as "a feeling of tension and anxiety associated with the manipulation of mathematical problems". In the same line of argument, Wigfield et al. (1988) defines mathematics anxiety associating it with worry and emotionality as well as nervousness and tension. Shalev et al. (2008), on the other hand, defines the phenomenon in terms of what they term dysfunctional dyscalculia where students experience a number processing and calculation disorder. Many students panic whenever they engage in mathematics calculations. As such, Luo et al. (2009) associates mathematics anxiety with panic, losing one's head, depression and helplessness. Chewning (2002) retorted "math anxiety is not an intellectual problem but an emotional problem, which can be overcome".

Defining children's fear for mathematics, Rossnan (2006) associates mathematics anxiety with difficulties in manipulation of numbers. Further, Gresham (2007), reiterating Khatoon et al.'s (2010) observations, describes the phenomenon by suggesting that students affected by it develop feelings of, among others, helplessness, tension, avoidance, boredom, fear and panic in students when asked to perform mathematics operations or problems. Durran et al. (2009) also agree with other writers when they include the feeling of tension or fear in their definition. Gleason (2009) reiterates what has been mentioned by many other authors and states that "mathematics anxiety involves feelings of tension and anxiety which interfere with the manipulation of numbers and the solving of mathematical problems". On their part, Cavanagh et al. (no date) report on MA using constructs such as tension, fear, low self-confidence, a negative mind-set towards mathematics learning and sweaty palms. This is also corroborated by Yuksel-Sahin (2008) who dwells extensively on "fear and apprehension to specific math-related situations" as well as students developing a sense of discomfort.

In the context of the current study, it is clearly evident that students who are taking some math and math-related modules are not able to cope with the rigors of numbers and hence perform very badly in simple calculations such as 7-9x3 or -23+4(5-1). They fail to follow simple brackets of division, multiplication, addition and subtraction (BODMAS) rules which they study even in primary schools and prefer to use a scientific calculator even for such simple operations. It is in this context that mathematics anxiety could be defined as a phenomenon in which students' brain processing capacity is at its all-time low.

Prevalence of Mathematics Anxiety

The prevalence of mathematics anxiety (MA) has been studied by many researchers (Outhred et al., 2000; Ridlon, 2004; Darla, 2005) and since a long time ago (Betz, 1978; Crawford, 1980; Fiore, 1999). From the experience in the classroom, the current study posits that MA is found everywhere from early learning centres, primary and high schools as well as colleges and universities. Perhaps the most logical way is to have a feel of what other authors say. In analysing literature therefore, a pertinent question is thus: Where is mathematics anxiety found?

While Shalev et al. (2008) reveals that mathematics anxiety (MA) is hereditary and manifests itself from early childhood, Sherman et al. (2003), on the other hand, found out that mathematics anxiety exists in a wide variety of ordinary life and academic situations. In the same vein, Khatoon et al. (2010) posit that MA can be found in elementary schools, high schools and college. Durrani et al. (2009) put it that the problem occurs in everyday life and academic environments. Zakaria et al. (2008), quoting others, noted that mathematics anxiety is prevalent among college students. Yuksel-Sahin (2008) observes that mathematics anxiety prevalent in elementary schools and early years of learning.

For the current study, it is noted that, the arguments put forward by various authors in the field of mathematics anxiety are highly applicable in the settings of BA ISAGO University College where students display negative effects of the phenomenon.

Causes of Mathematics Anxiety

The majority of students in many colleges in Botswana has scored a Grade C or lower in mathematics. Others have scored as low as D, E, F or even G and all these are regarded as pass grades. Many more students have resat for mathematics on many occasions in order to be able to finally obtain an acceptable grade that allows them to enter universities and colleges. Very few have scored grade B and better. It can be postulated that the poor results are due to many causes such as, among others, poor teaching methods at high school and the fear mathematics. Many authors

(mark-Zigdon, 2008; Nathan at al., 2000; Spencer et al., 1999), therefore, have carried out research to establish the causes of this mathematics fear.

For instance, Khatoon et al. (2010) categorize the causes of mathematics anxiety (MA) into environmental, intellectual and personality factors. The environmental factors deal with, for instance, the attitudes of teachers or parents. Parents also contribute to this problem by viewing their children as above all else or top in their classes and the fear and anxiety levels may increase especially if the children do not perform to the expectations of their parents. Learning styles and low self-esteem also cause MA.

Newstead (1998) blames mathematics anxiety on the teaching approach. The traditional approach where the teacher and peers are all gathered together in a classroom, with only the teacher talking, can have a negative effect on those students who are weak at solving mathematical problems. The new approach usually involves free discussions and encouragement with statements like "These questions are for YOU. You are not being tested" being used as motivators that boost morale towards mathematics. In a similar argument, Noser et al. (2008) cite deficiency in basic skill areas for students coming into the university for the first time from high school coupled with a weak mathematics background.

In the daily class settings in colleges and universities, it is quite evident that students have generally displayed a tendency consistent with negative attitudes which stem from some previous experiences whether at home or from the previous schools. To this effect, Rossnan (2006) supports this by noting the following factors causing the anxiety: "prior negative experience when learning math in the classroom or at home, teachers' and parents' attitudes and public exposure". The effect of such factors is that students can resort to memorizing concepts in mathematics rather than following the methods by applying the daily experiences they come across. Public exposure, timed deadlines and homework as punishment will also contribute to more mathematics anxiety. In this regard, Durrani et al. (2009) discuss the effects of negative versus positive attitudes calling for the need to motivate more for the development of numeracy skills. Yuksel-Sahin (2008) blames mathematics anxiety on several causes including negative attitude in mathematics learning environments, learning styles, parental attitudes, negative attitudes towards mathematics, avoidance and ineffective teaching styles ". University students who have a belief that they cannot be good in mathematics have a tendency of delaying sitting for mathematics related subjects after failing them for the first and subsequent times. In their ever-increasing terminology, they argue that they are "parking" (as in parking a car in a garage) the modules and would attempt them when they are next offered. It is likely, as with the University of South Africa (UNISA) that curricula can change. Lecturers or teachers also change and this causes the students to panic even more. In this vein of discussion, Ashcraft et al. (2007) have found that students avoid elective coursework in mathematics both in high school and college. This pushes them further away from attempting to manage mathematical problems. Ashcraft et al. then note that, even at college level, students avoid college majors taking them later in their school life and even delaying graduating. They have also observed that these students actually avoid career paths that involve mathematics.

Strategies to Curb Mathematics Anxiety

Mathematics anxiety has been observed to be a very big worry for many learning environments as it affects everyone: teachers, students and parents. It is because of this that researchers should work more on discovering and exposing the causes of the problem with a view to institute the relevant strategies to completely eradicate mathematics anxiety or at least to just reduce it.

Mathematics classes, according to the current students, are designed to be hard. Experience has shown that even simple number line subtraction operations such as 7-10 are very difficult for them. The current study proposes a question "What strategies can be employed to reduce mathematics anxiety or to eradicate it completely?"

To answer this question, some literature (Harding et al., 2006; Harper et al., 1998; Koedinger et al., 1994; Ridlon, 2004; Steele, 2004Trigo, 2004; Wei, 2010) is reviewed with the aim to discover what has been suggested. In this line of argument, Rossnan (2006) suggests many strategies to eliminate or at least reduce the problem of mathematics anxiety. Rossnan proposes a re-examination of the teaching methods in which the teaching should be reduced so that classes are more student-directed with a larger portion of learning time dedicated to discussion. Other strategies are, among others, to ensure that mathematics is enjoyable, to show the importance of mathematics in career and everyday life, to employ meaningful methods in teaching and to devise alternatives to written tests. Chewning (2002) states that "many students avoid mathematics and decide on their program of study based on the math courses needed to complete the degree requirement".

Some lecturers have shown negative attitudes by placing mathematics as the high-end and all-important asset of colleges and universities, in the process scaring students. They have done this against the backdrop that, other subjects, such as, among others, Business Communication, Business Management and Court Administration are just there to fill places in order to have a complete transcript. Yet mathematics can and must be made simple by converting everyday life experiences into simple mathematical functions and equations. For example, the gradient or slope concept, normally

stated as "dy/dx", could easily be explained in the context of a hill-climb up the Hills of Otse or a run down the Shashe river banks until no pressure to balance is felt at which "dy/dx" becomes zero. These figurative illustrations already reside in the minds of the learners as some of them hail from the places that have the Otse Hills and the Shashe River banks and can aid in simplifying mathematical concepts. In the same context, Durrani et al. (2009) encourage positive thinking and not discourage students. And Yuksel-Sahin (2008) urges "parents and teachers to set positive role models, to have democratic attitudes and to be supportive of children in order to foster competence in mathematics". They also suggest counselling and guidance as effective strategies. These strategies are designed to correct the deficiencies and negatives attitudes of students and teachers alike towards mathematics.

Methodology

This study uses a questionnaire to carry out an investigation of the levels of mathematics anxiety in BA ISAGO foundation students. The population consists of all students who are enrolled in the Bachelor of Commerce Degree in which mathematics is a compulsory module. The sample for this study was drawn from the classes that underwent extra lessons for the previously failed mathematics modules. The data collection exercise resulted in a sample comprising 255 Bachelor's degree students being able to complete the questionnaire. The questionnaire, administered to students during their classes, is anonymous and contains the following sections:

Section A: In this section, demographic details are recorded. This is an important section as has been observed by writers such as Khatoon et al. (2010) who have reported that school type, gender, age and others have a major effect on math anxiety noting that students, particularly from private schools, show lower levels of math anxiety than those from Government schools. In line with this reasoning, the questions in this section therefore solicit for gender, age, degree enrolled in, high school attended, high school type and a deliberate question probing them on awareness of some problem called math anxiety.

Section B: Following the trends, the general effects of math on students are captured in this section because the effects recorded in literature are likely to be seen in any group of respondents. Respondents are subjected to statements like, "I suffer when I do math" and "I lose confidence when studying math" to which respondents are expected to express their feelings towards the subject using a 5-point scale (1=Too much negative effect, 2=Much negative effect, 3=Moderate effect, 4=Little effect and 5=Very little effect).

Section C: This section probes respondents on how much effort they put towards developing numerical confidence. The question is: "How much effort do you put towards acquiring confidence in math?" to which respondents are expected to choose an option on a 5-point scale (1=No effort, 2=Very little effort, 3=Little effort, 4=Much effort and 5=Very much effort).

The sections B and C use a Likert scale also called a summative scale, which is a type of psychometric response scale often used and appropriate for questionnaires.

The distribution of students (255) differentiated by gender is shown in Table 1. Female respondents constituted 66.3% while their male counterparts made up 33.7%.

Table 1: Gender Distribution

Gender	Frequency	Percent	Cumulative Percent
Female	169	66.3	66.3
Male	86	33.7	100.0
Total	255	100.0	

The gender bias is due to the fact that the class had far much more female students as compared to the males.

Results

Section A of the questionnaire produced five tables of analyses which mainly included demographics information such as gender, mathematics grade and school type.

First, respondents were probed on their high school grades on a scale A*, A, B, C, D, E, F and G. Table 2 was used to summarize the findings.

Table2: High School Grades

			Grade							Total
			A*	B	C	D	E	F	G	
Gender	Female	Count	0	2	99	37	19	10	2	169
		% within Gender	0%	1%	59%	22%	11%	6%	1%	100%
	Male	Count	1	7	54	11	5	6	2	86
		% within Gender	1%	8%	63%	13%	6%	7%	2%	100%
Total		Count	1	9	153	48	24	16	4	255
		% within Gender	**0.4%**	**3.5%**	**60.0%**	**18.8%**	**9.4%**	**6.3%**	**1.6%**	**100.0%**

Table 2 shows that majority of students obtained a grade of C and D from high school in mathematics constituting 59% and 22% respectively for females and 63% and 13% respectively for males. Furthermore only 10 students obtained grades better than the C grade.

Further, the participants were asked to state the types of schools they attended among mission, Government and private and Table 3 presents the findings.

Table 3: School Type

			Type			Total
			Mission	Government	Private	
Gender	Female	Count	18	145	6	169
		% within Gender	11%	86%	4%	100%
	Male	Count	6	75	5	86
		% within Gender	7%	87%	6%	100%
Total		Count	24	220	11	255
		% within Gender	9%	86%	4%	100%

Table 3 reveals that the majority of students came from Government schools (86%) followed by mission schools at 9% and lastly private schools at 4%. This huge distortion can however be explained by the fact that the majority of high schools in Botswana are Government owned.

Asked to rate whether mathematics was easy, hard or if they could not tell, the analysis is depicted in Table 4

. Table 4: Rating Mathematics

			Rate Maths			Total
			EASY	HARD	CANNOT TELL	
Gender	Female	Count	16	87	64	167
		% within Gender	10%	52%	38%	100%
	Male	Count	18	34	33	85
		% within Gender	21%	40%	39%	100%
Total		Count	34	121	97	252
		% within Gender	14%	48%	39%	100%

Table 4 shows that 52% of females rate mathematics as being "*hard*" while males at 40% rate the subject the same. Comparison by gender may not reflect the true picture, as earlier observed, since the sample size was skewed towards females. Therefore it can be seen that 48% of the sampled students indicated that maths is hard while 14% said it is easy and 39% were indifferent.

A test for independence was performed between some variables of interest and results are shown Table 5.

Table 5: Gender and Mathematics Ratings

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.334[a]	2	.026
Likelihood Ratio	7.047	2	.029
Linear-by-Linear Association	1.510	1	.219
N of Valid Cases	252		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.47.

Table 5 shows the chi-square test which was performed between two categorical variables being gender and rate maths. These results indicate that there is statistical relationship between gender and different levels of math rates (chi-square with two degrees of freedom= 7.334, p= 0.026).

Students' performance was measured and results listed in Table 6.

Table 6: Student Performance

			Very Good	Good	Dont Know	Poor	Very Poor	Total
Gender	**Female**	Count	5	78	16	54	16	169
		% within Gender	3%	46%	10%	32%	10%	100%
	Male	Count	4	43	11	18	10	86
		% within Gender	5%	50%	13%	21%	12%	100%
Total		Count	9	121	27	72	26	255
		% within Gender	**4%**	**48%**	**11%**	**28%**	**10%**	100%

Table 6 shows that 48% of students had good performance followed by 28% students with poor performance and the least is very good performance with only 4% of the students.

Data was collected using Section B of the questionnaire and four tables resulted from the subsequent analyses. These addressed the statement "state the effects of mathematics anxiety on you".

Opinions on the effects of mathematics anxiety on students were sought. Specifically, the direct statement put to them (students) was: "state the effects of mathematics anxiety on you". The responses were "*no effect*", "*little effect*", "*moderate effect*", "*much effect*" and "very much effect" on the constructs *confidence, panic, boredom and fear.*

On confidence, the analysis is as displayed in Table 7.

Table 7: Confidence

		High School			
		URBAN		RURAL	
		Count	Row %	Count	Row %
Confidence	No Effect	32	68%	14	30%
	Little Effect	53	65%	28	34%
	Moderately	30	63%	18	38%
	Much	31	72%	11	26%
	Very Much	24	69%	10	29%

From Table 7, it can be seen that students who attended urban schools (69%) indicated that, they very much lose confidence when it comes to mathematics which is an effect of mathematics upon their lives as compared to 29% of students who attended schools from rural location. Now in each different category of the study variable "*I lose confidence*", it can be see that, with regards to comparison between urban schools and rural schools, higher percentages towards urban schools are obtained, which is a result of the sample consisting of many students who attended high schools in an urban location. Furthermore, 72% of students who attended urban schools and 26% who attended rural schools indicated that they lose confidence "much" as a result of the effects of mathematics.

Participants were asked about their level of panic the results (categorized under *urban* and *rural*) of which are presented in Table 8.

Table 8: Panic by School Location

		High School			
		URBAN		RURAL	
		Count	Row %	Count	Row %
Panic	No Effect	22	61%	14	39%
	Little Effect	43	71%	17	28%
	Moderately	25	63%	15	38%
	Much	37	67%	18	33%
	Very Much	43	68%	17	27%

From Table 8, it can be seen that students who attended urban schools (68%), revealed that they panic "*very much*" panic when it comes to mathematics which is an effect of mathematics upon their lives as compared to 27% of students who attended schools from rural location. Now in each different category of the study variable "I Panic", it can be seen that with regards to comparison between urban schools and rural schools, there are higher percentages towards urban schools, which is a result of the sample consisting of many students who attended high schools in an urban location. Furthermore, 67% of students who attended urban schools and 33% who attended rural schools indicated that they panic much as a result of effects of mathematics. Also, 71% of students who attended urban schools and 28% who attended rural schools indicated that panic has little effect upon them.

Respondents were then probed on about how bored they felt when studying mathematics and results are depicted in Table 9.

Table 9: Bored by School Location

		High School			
		Urban		Rural	
		Count	Row %	Count	Row %
Bored	No Effect	61	66%	30	32%
	Little Effect	53	76%	17	24%
	Moderately	27	59%	18	39%
	Much	12	52%	10	44%
	Very Much	17	74%	6	26%

From Table 9, it can be deduced that students who attended urban schools (74%), become bored very much when it comes to mathematics which is an effect of mathematics upon their lives as compared to 26% of students who attended schools from rural location. In each different category of the study variable "I become bored", it can be noticed that with regards to comparison between urban schools and rural schools, higher percentages are for urban schools, which is a result of the sample consisting of many students who attended high schools in an urban location. Furthermore, 52% of students who attended urban schools and 44% who attended rural schools indicated that they become much bored as a result of effects of mathematics. Also, 76% of students who attended urban schools and 24% who attended rural schools indicated that boredom for mathematics has little impact upon them to be considered as an effect.

Fear for mathematics was another construct in the research instrument. Results are presented in Table 10.

Table 10: Fear by School Location

		High School			
		Urban		Rural	
		Count	Row %	Count	Row %
Fear	No Effect	44	67%	21	32%
	Little Effect	41	70%	16	27%
	Moderately	28	61%	18	39%
	Much	24	77%	7	23%
	Very Much	33	62%	19	36%

Table 10 shows that students who attended urban schools (62%) fear very much when it comes to mathematics which is an effect of mathematics upon their lives as compared to 36% of students who attended schools from rural settings. In each different category of the study variable "I fear", it can be seen that, with regards to comparison between urban schools and rural schools, there are higher percentages towards urban schools, which, again, is a result of the sample consisting of many students who attended high schools in an urban location. Furthermore, 77% of students who attended urban schools and 23% who attended rural schools indicated that they fear "*much*" mathematics. Also, 70% of students who attended urban schools and 27% who attended rural schools indicated that fearing mathematics has little impact upon them to be considered as an effect.

***SECTION C:* How much effort do you put towards improving your Math's performance?**

This section produced three tables based on effort to improve mathematics performance. In order to be able to suggest any strategies to solve the mathematics anxiety problem, respondents were asked to state their effort levels towards liking mathematics. The first construct in this section addressed suffering. Results obtained are as presented in Table 11.

Table 11: Effort to Address Suffering

		Programme					
		Risk Management		Banking & Finance		Diploma In Insurance	
		Count	Row %	Count	Row %	Count	Row %
Addressing Suffering	No Effort	8	38%	12	57%	1	5%
	Very Little Effort	12	31%	25	64%	2	5%
	Little Effort	21	27%	50	64%	7	9%
	Much Effort	30	42%	38	53%	4	6%
	Very Much Effort	14	31%	30	67%	1	2%
Total		**85**		**155**		**15**	

Table 11 shows that Banking & Finance programme has students who put very much effort with regards to addressing their suffering regarding mathematics (67%) while Risk Management students constitute 31%. Again Banking & Finance programme constitutes a higher percentage of students who do not put any effort to address the suffering (57%). This is much affected by high numbers of Banking & Finance students in the selected sample.

To address fear reduction efforts, data was collected and analysed and then presented in Table 12.

Table 12: Efforts to Address Fear Reduction

		Programme					
		Risk Management		Banking & Finance		Diploma In Insurance	
		Count	Row %	Count	Row %	Count	Row %
Reduce Fear	No Effort	6	7%	9	6%	2	13%
	Very Little Effort	12	14%	15	10%	1	7%
	Little Effort	17	20%	32	21%	2	13%
	Much Effort	27	32%	41	26%	4	27%
	Very Much Effort	23	27%	58	37%	6	40%
		85		**155**		**15**	

The analysis in Table 12 shows higher percentages, in all the three programmes, of those who put a lot of effort in reducing fear for mathematics. Low percentages are reported in those who put no effort to reduce the fear for the subject.

Effort to address the reduction of anxiety was the last construct tested and the analysis produced Table XIII.

Table 13: Efforts to Address Reduction of Anxiety

		Programme					
		Risk Management		Banking & Finance		Diploma In Insurance	
		Count	Row %	Count	Row %	Count	Row %
Reduce Anxiety	No Effort	5	6%	11	7%	1	7%
	Very Little Effort	11	13%	21	14%	1	7%
	Little Effort	31	36%	42	27%	7	47%
	Much Effort	21	25%	40	26%	3	20%
	Very Much Effort	17	20%	41	26%	3	20%
		85		**155**		**15**	

The highest percentages are depicted in those who said that they put little effort to reduce their anxiety towards mathematics. Risk Management had 36%, 27% for Banking and Finance and Diploma in Insurance contributed 47%. Relatively lower percentages were recorded in the "*very much effort"* category with 20% for Risk Management, 26% for Banking and Finance with 20% for Diploma in Insurance.

Discussion

This study has shown that mathematics anxiety exists in the BA ISAGO community and most probably as well as anywhere else as the literature has suggested. Through analysis of data, many findings emerged.

These are:

1. High school grades are very low as shown by the results obtained. It is upon the Government of Botswana to ensure that mathematics education is strengthened at all levels: infant, primary, junior and senior secondary, colleges and universities by employing teachers and lecturers with ability to tackle mathematics.
2. Students fitted into categories: those who think that mathematics is difficult, others who say it is easy and those who are indifferent.
3. Confidence, panic, boredom and fear were some constructs researched on to gauge students' perceptions of mathematics. Overall, urban schools produced more confident students than rural. They also panicked, feared and got bored more. However, this distortion can be explained by the sample composition which tended to have more students from urban schools than rural ones.
4. Students indicated that they are putting effort to address suffering, fear for mathematics and reduce anxiety.

It is in this vein that this study proceeds to suggest strategies that can be put in place to address all the issues identified. The strategies are solely based on literature and inputs from the respondents.

These, among others, are:

1. Re-examine the mathematics teaching methods as suggested also by Rossman (2006) that student centred learning should be instituted where more time is dedicated to discussions, quizzes and other aids.
2. Raise an awareness to show the importance of mathematics in all careers.
3. Encourage positive thinking as also suggested by Durrani et al. (2009).
4. Foster competence in mathematics from an early age. Teachers and parents are expected to take a leading role in this matter as also expounded by Yuksel-Sahin (2008).

These and many more other strategies continue to evolve from generation to generation and hence there is need to introduce situational strategic approaches so as to completely eliminate this problem of mathematics anxiety.

Conclusion and Future Research

Mathematics anxiety is a phenomenon that has taken root at many levels in academic and ordinary life: infancy, primary and secondary schools students, colleges and universities and people in general. It is therefore imperative upon researchers to carry out nation-wide studies which cover all the levels to discover, among others, what mathematics anxiety is, where it starts from and how it can be minimized or eradicated. The research instrument should be such that it can be able to capture data on how strategies to curb mathematics anxiety can be crafted.

In this regard, the research policy of the country must contain a separate section which specifically addresses mathematics anxiety holistically so that the population of Botswana can appreciate and enjoy mathematics from an early life.

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