

**Factors that influence demand of private supplementary tuition and its perceived impact on students' achievement in mathematics in Botswana**



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## APPROVAL PAGE

This research essay has been examined and approved as meeting the required standards of scholarship for partial fulfilment of the requirement for the Master of Education Degree (Mathematics Education).

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## **STATEMENT OF ORIGINALITY**

The author at the University of Botswana between August 2014 and May 2017 completed the work contained in this research essay. It is the original work, except where reference is made and neither this work be submitted for the award of any other University degree.

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## **ABSTRACT**

Private tuition also referred to as ‘Shadow education’ has emerged as an important parallel education sector due to its growing demand globally. In Botswana, the increase in demand is evidenced by increased advertisements and tuition centres especially in urban settings. The purpose of this study was to establish the factors that drive the increased demand for private tuition. Secondly it sought to establish if private tuition has any impact on performance in mathematics. The study employed a descriptive survey research design. The target population was senior secondary school students and mathematics teachers. The sample was drawn from Form Five/Four students from two private and two public schools in Gaborone and their mathematics teachers. Stratified purposeful sampling was used to select the schools. Simple random sampling was used to select the Form Five/Four classes and convenience sampling for the mathematics teachers. The instruments were questionnaires for the students and semi-structured interviews for the teachers. Validity was done by input of supervisor and pilot study. The questionnaire items were analyzed by using descriptive statistics such as frequency counts, percentages and correlations. The interviews were analyzed by identifying the patterns in the data with reference to the research questions. The findings of the study revealed that poor performance and preparation for examinations were the main factors for the increased demand for private tuition. Secondly, engaging in private tuition may not necessarily improve performance in mathematics.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

BGCSE	- Botswana General Certificate of Secondary Education
BOCODOL	- Botswana College of Distance and Open Learning
EBS	- Educational Broadcasting System
IEA	- International Association for the Evaluation of Educational Achievement
IGCSE	- International General Certificate of Secondary Education
JC	- Junior Certificate
KELS	- Korean Educational Longitudinal Study
OECD	- Organization for Economic Cooperation and Development
PISA	- Program for International Student Assessment
PSLE	- Primary School Leaving Examinations
SACMEQ	- Southern and Eastern Africa Consortium for Monitoring Education Quality
SPSS	- Statistical Package for Social Sciences
TEPS	- Taiwan Education Panel Study
TIMSS	- Trends in International Mathematics and Science Study
UNESCO	- United Nations Educational, Scientific and Cultural Organization

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Education is considered as one of the major activities that increase human capital, hence a key determinant of individual productivity and economic growth. Globally, educational policies tend to focus on public or state schools and to a lesser extent on the private school sector and hardly any mention of the private tutoring industry. Yet, in many countries, private tutoring that provides supplementary instructions to students from both public and private schools has arisen as a substantial educational sector (Dang & Rogers, 2008). Private tutoring is now a widespread educational phenomenon and is evident in countries with diverse economy such as Japan, Egypt, Mauritius, Turkey, Republic of Korea, Canada, United States and United Kingdom amongst others. Findings from studies done in some of the above countries reveal the following statistics;

In Canada, the number of formal businesses that offer private tutoring grew from 200% to 500% in major Canadian cities in the last three decades (Aurini & Davies, 2004). In Mauritius, 100% of the students received private tuition in Form 5 and 6 (Foondun, 1998). In Turkey, 35% received private tuition (Tansel & Bircan, 2006), and in United Kingdom, 27% across the grades received private tuition (Ireson & Rushforth, 2005). East Asian countries have a long tradition of private tuition and even have names for it, for example in Japan, the tutoring centres are called '*yobiko*' (Cram schools) and '*hakwon*' (Cram schools) in Korea. Such centres are mainly used for exam preparation especially for entry into universities.

In Africa, a study done using cross-national data by Southern and Eastern Africa Consortium for Monitoring Education Quality (SACMEQ) using Grade 6 learners revealed that 44.7% in Namibia, 80% or more in Kenya, Malawi and Mauritius received private tuition (Paviot, Heinsohn & Korkman, 2008). The above data indicate that private tuition exists in both developed and developing countries and there is increased demand. Despite the increased demand, private tutoring has received mixed responses from policymakers. In some countries it has been ignored while in others it is actively controlled and regulated. According to Bray (1999) private tuition has been banned at various times in Cambodia, Mauritius, Myanmar and Korea. Critics against private tuition claim that it promotes social inequalities, disrupts the mainstream education system and it does not increase academic performance.

Globally, education systems have experienced extensive growth over the decades. In Botswana since the seventies, there have been many social and economic changes. Similarly, the country's education system has expanded in size and complexity. This led to the appointment of the National Commission on Education of 1992 to have a comprehensive review on the education system with a view of identifying problems and strategies for further development in the context of Botswana's changing and complex economy. One of the goals of the Revised National Policy on Education was to prepare Botswana for the transition from the traditional agro-based economy to the industrial economy which requires Science and Technology. As a result, one of the objectives emphasized the strengthening of Science and Technology in the curriculum. To achieve this objective and in addition to the science subjects, the Curriculum in Botswana is designed such that mathematics is a core subject at Primary, Junior and Senior Secondary schools and is examined at the end of these levels (The Revised National Policy On Education, 1994). Similarly for the private schools following the

International General Certificate of Secondary Education (IGCSE) curriculum, mathematics is also listed as a core subject.

At the tertiary level a credit pass in mathematics is a requirement for admission for a number of programmes for example, Science based programmes as well as Business Administrative programmes. Students aspiring to join such programmes require a pass in mathematics in order to be considered for admission both locally and internationally. Such students may then seek for assistance in mathematics outside of school for either remedial or enrichment purposes. Therefore the high stakes examinations create competition making students engage in private tuition.

Since private tuition has risen to a global phenomenon, this study sought to establish the distinctive features of private tuition in Botswana by finding out why the students engage in private tuition and if it has any impact in their performance especially in mathematics. Secondly, being a mathematics teacher, some of the students that I teach do go for private tuition and I would like to find out why they attend, are the tutorials beneficial and are there factors that I need to incorporate to improve my teaching of mathematics.

## **1.2 Definition of private tuition**

In order to understand the nature of the phenomenon, it is important to consider the definitions from previous studies and what was adopted for this study. According to Bray (1999), private tuition may be defined based on three criteria namely, supplementation, privateness and academic. Bray also refers to private tuition as “Shadow Education”. The metaphor of shadow is appropriate because private tuition exists because the mainstream

education exists. Secondly, as the size and shape of the mainstream changes, so does shadow education. In this study this supplementary education was referred to as private tuition.

Some of the definitions researchers have come up with on private tuition include:

Fee based tutoring that provides supplementary instruction to students in academic subjects that they study in the mainstream education system (Dang & Rogers, 2008).

Education outside the formal schooling system where the tutor teaches particular subject(s) in exchange for financial gain (Tansel & Bircan, 2006).

A set of educational activities that occur outside schooling and are designed to enhance the students' formal school career (Stevenson & Baker, 1992).

The above definitions encompass the criteria Bray used. Firstly, private tuition is there for supplementation since it covers only subjects that are already covered in formal schools such as English, Science and mathematics. Secondly, being private means that the services are offered by individuals or entrepreneurs with the sole purpose of profit making and thirdly, private tuition mainly covers academic subjects that are taught in formal schools and are examinable. This study also adopted the three criteria and investigated private tuition as being supplementary, profit based and academic but only focussed on mathematics.

### **1.3 Statement of the Problem**

As the demand for private tuition increases worldwide, it would be of interest to describe distinctive features of the phenomenon in Botswana. In recent years there have been increased advertisements for private tuition in local newspapers and emergence of tuition centres especially in urban centres such as Gaborone. This study sought to explore the

reasons for increased demand for private tuition and if it has any impact on students' performance particularly in mathematics.

#### **1.4 Purpose of the study**

In Botswana, a number of studies have been done on students' attitudes towards learning of mathematics and poor performance. There is no published study that has been undertaken on private tuition. Therefore the purpose of this study was to establish the reasons why students engage in private tuition in mathematics and the impact it has on their performance.

#### **1.5 Research Questions**

The study was guided by the following research questions:

1. Increased demand for private tuition in mathematics:

*What factors drive the demand for private tuition in mathematics?*

2. Impact on students' performance:

*What is the impact of private tuition on students' achievement in mathematics?*

#### **1.6 Significance of the Study**

Previous research done focussed on private tuition in all the academic subjects and on its policy implications (Bray, 1999; Dang & Rogers, 2008). Amongst the academic subjects, mathematics had the highest demand comparatively. As there is no documentation on how private tuition impacts students performance in mathematics particularly in Botswana, information from this study forms a baseline for future studies on the phenomenon.

Secondly, findings from previous studies indicate mixed results with regards to academic achievements. Some of the studies that indicated positive impacts includes; Stevenson and

Baker (1992); Buchmann (2002) and Tansel and Bircan (2006). On the other hand, Cheo and Quah (2005) and Lee, Kim and Yoon (2004) indicated insignificant and negative impacts respectively. Therefore, this study may be of benefit to students and parents by creating awareness on academic outcomes by engaging in private tuition.

Since private tuition is not an independent educational activity but coexists with mainstream education, collaboration between the two would probably bridge gaps with a view of improving performance in mathematics nationally. Furthermore, the findings may be used by the policy makers in Education to appreciate that private tuition is expanding and to probably find ways of ensuring that it rather compliments and does not compromise the mainstream education system in the near future.

### **1.7 Scope of the Study**

Studies done so far on private tuition indicate that the demand is more prominent in urban areas and around the transitional points in education, for example, from primary school to secondary school and also from secondary school to university. Therefore, this study was limited to Senior Secondary Schools in Gaborone which is an urban location. The study sample was taken from Form Five/Four classes from two private and two public schools therefore making the study relevant to the population in Gaborone.

### **1.8 Limitations of the Study**

Data collection remains a challenge on studies in private tuition, such that even international studies like Trends in International Mathematics and Science Study (TIMSS), cross national studies like SACMEQ had shortcomings arising from the data collection. Similarly, there were challenges with data collection with some of the schools delaying the process by

postponing the data collection process. Secondly, some of the respondents were not completely genuine resulting in inconsistent and inaccurate responses. Thirdly, the sample was drawn from schools in Gaborone which is an urban setting therefore the results may not be generalizable beyond the specific population from which the sample was drawn. The analysis on the impact on improved performance was based on the students' ratings that may have not been entirely genuine.

### **1.9 Outline of the Study**

The study comprises five chapters. Chapter one includes the background to the study, definition of private tuition, statement of the problem, purpose of the study, research questions, significance of the study, scope of the study and limitations of the study. Chapter two presents literature review and theoretical framework for the study. Chapter three outlines the methodology of the study, research design, target population and sample, sampling procedure, instruments, validity and reliability, data collection procedure and data analysis. Chapter four consists of data analysis, data presentation and discussion of the findings. Chapter five presents summary, conclusions and recommendations.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Private tuition is not a new phenomenon and has been practised in both developed and developing countries (Bray, 1999). In some cases it was part of the educational environment hence existence was not questioned. In recent times private tuition has grown significantly to become a big enterprise that demands huge amount of time from both tutors and students. This chapter offers literature review on private tutoring. The chapter is organized into eight sections. Section 2.1 provides historical overview of private tuition. Section 2.2 offers the theoretical framework that guided the study. Section 2.3 presents an overview on the scale and nature of private tuition. Section 2.4 considers the providers and consumers of private tuition. Section 2.5 looks into the intensity, frequency and duration of private tutoring. Section 2.6 explores the impact of private tuition on academic performance. Section 2.7 looks at Private Tuition in Botswana. The final section 2.8 presents a summary in an effort to raise issues that led to undertaking the study.

#### **2.2 Historical Overview**

The issue of private tuition also referred to as shadow education emerged onto the international stage in the 1980's as a part of reaction to the cross-national comparisons of achievement tests organised by educational establishments such as the International Association for the Evaluation of Educational Achievement (IEA) and Organisation for Economic Cooperation and Development (OECD) (Mori & Baker, 2010). Trends in International Mathematics and Science Study (TIMSS) and Program for International Student Assessment (PISA) were tests organised by IEA and OECD respectively. In these tests the East Asian countries such as Hong Kong, Japan, Singapore, South Korea and Taiwan

performed exceptionally well. Private tuition was already in existence in these countries so it was viewed as a cultural practise limited to East Asian Countries and that it contributed to their high performance in the tests. On the other hand, the high rates of private tuition in these countries could be attributed to cultural factors, specifically the influence of the Confucian tradition that valued the role of effort in educational success (Ireson & Rushforth, 2014). On the contrary, Tweed and Lehman (2002) proposed that the United States and other culturally Western groups had been influenced by the Socratic tradition which placed emphasis on the questioning of authority, tendency to evaluate and self generated knowledge.

In order to understand the scope and impact of private tuition on an international scale, United Nations Educational, Scientific and Cultural Organization (UNESCO) funded Mark Bray (1999) a comparative sociologist, who by drawing from existing research analyzed the extent of the phenomenon, the factors explaining its existence and the impact it had at national levels (Southgate, 2009). Since then more studies have been done such as Aurini (2006), Aurini and Davies (2004), Baker, Akiba, Le Tendre and Wiseman (2001), Bray and Kwok (2003). These studies provided further empirical evidence on the phenomenon.

As private tuition grew into an enterprise, entrepreneurs who created formal establishments for tutoring commonly called them centres, academies or institutes while in some countries these centres are referred to by special names. In Japan, tutoring centres that supplement the school system are known as *juku*. They also have *yobiko* which mainly serves students who have left school. Similar to *yobiko* are *crammers* in the United Kingdom which also cater for students who have left school, although some of them offer supplementary tuition to students who are still in school (Bray, 1999). In Korea, the centres are known as *hakwon*, *grinds* in Ireland, *frontisteria* in Greece and *dersane* in Turkey. The special terminologies for the

phenomenon is an indication to its prevalence and some of the international studies suggests that this relatively small scale activity is expanding at a rate that will have a large impact on the education systems in the future (Bray, 2003).

### **2.3 Theoretical framework**

The Theoretical framework for the worldwide demand for private tuition comes from economic, educational or comparative perspectives (Dang & Rogers, 2008). Economic and educational factors include expenditure on public education, characteristics of education systems and household income. Drawing from Economic Capital Theory several studies showed that children from higher socioeconomic status families are more likely to engage in private tuition than their counterparts from lower socioeconomic status. Such studies include; Ireland (Smyth, 2009), Turkey (Tansel & Bircan, 2006), Canada (Davies, 2004) and Hong Kong (Bray & Kwok, 2003).

According to Dang and Rogers (2008), the microeconomic theory of supply and demand may be used to interpret the private tuition phenomenon. The theory explains how the quantity of education is determined by the interaction between the supply and demand for education in the market. To a certain level, the mainstream education system may not be able to offer both quantity and quality education. In this case, students engage in private tuition to meet the demand for education where the mainstream education system cannot. However, these theoretical frameworks have not been applied to the empirical study of private tuition hence they remain assumptions.

Other than the microeconomic theory of supply and demand, other factors may also lead to demand for private tuition. Drawing from existing studies, Dang and Rogers (2008)

highlighted both the micro or macro factors that may influence the demand for private tuition. The micro factors include household income, parental education and urban location. Studies done in Egypt (Assaad & El-Badawy, 2004), Japan (Stevenson & Baker, 1992), Korea (Lee, Kim & Yoon, 2004), Turkey (Tansel & Bircan, 2006) provides the empirical evidence that supports the influence of the micro factors on private tuition. These variables imply that students from richer, more educated households living in urban areas are more likely to attend private tuition.

On the other hand the macro factors include the transition of private tuition into a market economy such that the phenomenon has spread into countries where it did not exist such as some African countries, Eastern Europe and former Soviet bloc (Bray, 1999). Secondly, the tight linkage between level of education and work has led to intense competition for more education hence the increase in demand for private tuition (Stevenson & Baker, 1992). Furthermore, the high stakes formal examinations that is a prerequisite for entry into institutions of higher learning means increased competition thus greater demand for private tuition (Bray, 1999). Thirdly, the ineffectiveness of public education system whereby the parents and students are not satisfied with the public education system, they find other ways of meeting their educational needs hence the participation in private tuition (Kim & Lee, 2010). Lastly, low pay and weak monitoring of teachers especially in public schools may create a private tutoring market for teachers who wish to earn more income (Buchmann, 1999; Silova & Bray, 2006). However, little formal empirical research has been done to test these hypothesis hence they remain speculative.

Baker et al. (2001) is the only cross national study that looked at the macro factors to determine the use of private tuition. By using the TIMSS (1995) results where 41 countries

participated, the study revealed that higher public education expenditure and gross enrolment rates predicted lower use of private tuition thereby suggesting that private tuition is more popular in countries with weak and inefficient public education systems. The cross national average for the study suggested that more than a third of the seventh and eighth grade students participated in private tuition. Furthermore, of the entire international sample 36.9% regularly participated in private tuition to improve their mathematics performance. On the contrary, high stakes testing system had no significant impact on private tuition according to Dang and Rogers (2008). However, the analysis did not control for confounding variable per-capita income levels which is highly correlated with both public education expenditure and gross enrolment, hence the results could be biased.

## **2.4 Characteristics of private tuition**

### **2.4.1 Scale of private tuition**

Although incidences were largely found in East Asian Countries, the growth of private tuition is evident in many countries of different sizes, levels of economic development and geographical locations as indicated by the following studies: In Africa, countries like Kenya, Malawi, Zambia and Mauritius (Paviot, Heinsohn & Korkman, 2008), in Western Europe (Smyth, 2009), North America (Davies & Aurini, 2006; Mori, 2009).

The scale of private tuition varies nationally due to the different cultures, nature of mainstream education system and economic structures (Bray, 1999). Table 2.1 below shows the prevalence of the phenomenon in some of the countries.

**Table 2.1****The scale of private tuition from selected countries**

<b>Country</b>	<b>Scale from various studies</b>	<b>Source</b>
Cambodia	From survey done in 1997/1998, 31.2% received private tuition in primary schools. 61% of students from urban areas received private tuition as compared to 9% from the rural areas.	Bray ( 1999)
Canada	Number of tutoring businesses in major cities like Ontario grew between 200% and 500% during the 1990s.	Aurini & Davies (2004)
Egypt	A 1994 study found that 65% of urban and 53% of rural children in primary schools received private tuition.	Fergany (1994)
Hong Kong	A 1996 survey found that 45% from primary, 26% from lower secondary, 34% from middle secondary and 41% from upper secondary received private tuition.	Lee (1996)
Japan	24% from elementary school and 60% from secondary school received tuition form a study done in 1993. By the time they complete middle school, 70% of the students had received tuition.	Russell (1997)
Kenya	A 1995-1999 (SACMEQ I) national study for Grade 6 found that 69% received private tuition, and by 2000-2004 (SACMEQ II) it increased to 88%.	Paviot et al (2008)
Mauritius	According to SACMEQ I, 76% of Grade 6 students received tuition and from SACMEQ II it increased to 87%.	Paviot et al (2008)
Singapore	A 1992 study found that 49% of students from primary school and 30% from secondary school had received private tuition	George (1992)
Turkey	A 2001 study found that 35% of High school students received private tuition.	Tansel & Bircan (2006)
United kingdom	18% and 19% of Years 6 and 11 respectively received private tuition and 14% of Year 13. This study was only done in England.	Ireson & Rushforth (2014)
Zimbabwe	A 1995 study of grade 6 found that 61% of the students received private tuition.	Machingaidze, Pfukani & Shumba (1998)

**Source: The table is based on information from Table 1 in Bray (1999) and Dang & Rogers (2006).**

### **2.4.2 Nature**

The nature of private tuition also varies, as it may be one-to-one in the home of either the tutor or tutee, either by re-teaching concepts taught in school, assisting with homework, working on exercises or any other form fitting the circumstances of the student. Other tutoring may be small groups, large classes at the tuition centres or lecture theatres, or by correspondence through mail, use of telephone and over the internet.

Japan stands out as having a highly institutionalized form of private tuition the “Kumon Educational Institute” which is one of the largest global tutoring centres that assist students exclusively in Mathematics by use of workbooks. The Kumon centres have spread to other parts of Asia, Africa, Central and South America, Europe, Middle East and even to North America (Bray, 1999). In Canada, the “Sylvan Learning Centres” are also fastest growing franchise in North America (Aurini & Davies, 2004). In comparison to the Kumon, the Sylvan Centre’s do not limit their services to mathematics, but also provide other services like content specific courses in language and science, test preparation and study skills. The establishment of such centres globally is an indication that private tuition in mathematics is in high demand as compared to other subjects.

### **2.4.3 Intensity, frequency and duration**

Bray (1999) indicates that private tuition is intense at the secondary school level rather than the primary level and even within these levels there is more demand in grades that lead to major examinations. Due to the variations in private tuition, little is known on the amount of time students spend and how often they attend tuition so as to quantify their impact on performance. In addition, private tuition is not limited to after school but is also done over the

weekends, public holidays and during vacation; this is seen as a negative impact because it denies the students sufficient resting time causing fatigue and may reduce performance.

According to Bray (2007), a study in Sri Lanka indicated that the duration of tuition received by science students was almost three times that received by art students and nearly twice that received by commerce students. Intensity also varies according to the time of the year. In Malaysia, 70% of students sampled received tuition throughout the year while the rest only received tuition prior to important examinations.

#### **2.4.4 Providers and Consumers**

According to the microeconomic theory of supply and demand, sometimes supply creates demand. In this case, the providers make private tuition available and recommend students to take advantage of the availability of the services. On the other hand, the consumers in this case the students find that the services are available and make use of it. The providers may be individuals, group of individuals or enterprises that employ tutors. The tutors may be teachers from mainstream schools offering private tuition in order to receive additional payment. Such tutors may be tutoring students that they are teaching in the mainstream schools as well as students from others schools. Tutoring students from their own schools may be compromising because they may deliberately not complete the syllabus to ensure that the students attend their tutorials. Secondly, they may penalise the students who do not go for tuition by failing them in tests thereby creating a market for their services. Such practises are reportedly common in Cambodia (Bray, 1999). As a result of such anomalies, countries such as Singapore, the Republic of Korea and Morocco have put regulatory measures where mainstream teachers are not allowed to accept payment for private tuition for their own students. Furthermore the composition of the tutors is such that; they are of varying ages,

may be qualified or not qualified, male or female, full time or part time, self employed or employed by an institution, university students and retired teachers. This wide range of tutors may compromise the quality of private tutorials thus accounting for the conflicting findings on impact of private tuition on academic achievement.

Although parents pay for the private tutorials, students are the primary consumers. Generally it is assumed that the dominant group of students receiving private tuition are those whose academic performances are low. On the contrary, Tseng (1998) showed that in Hong Kong and Taiwan, the proportion of students in high ranking schools taking private tuition is greater than those from low ranking schools. In addition, private tuition is more utilized in urban areas as compared to rural areas. A study in Cambodia showed that among the urban schools in the sample, 61% of the students received tuition as compared to only nine percent in rural schools (Bray, 1999), and in Malaysia, 59% from urban schools received private tuition and 28% from rural schools. The higher demand in urban areas may be due to higher levels of competition which is typical of urban areas. Secondly, parents in urban areas generally have higher educational attainment and are therefore more informed on educational issues and are willing to invest more in their children's' education. Since this study was to find out the reasons why students engage in private tuition, it is of interest to identify some of these reasons from previous studies. A study by Tseng in Hong Kong indicated some of these reasons as shown in Table 2.2. Similar responses were obtained from other studies done in Sri Lanka and Malta. In this study, the responses were adopted and given as options in the questionnaire.

**Table 2.2 Reasons for engaging in private tuition in Hong Kong**

<b>Main reason</b>	<b>Percentage</b>
My academic performance is not very good	71%
I do not understand what the teacher teaches in class	14%
To prepare for the public examination	8%
My parents want me to	2%
No one in my family can help me with my homework	1%
Some of my classmates attend private tuition	1%
Other reasons	2%
Do not know/hard to say	2%

**Source: Adopted from Table 7 Bray (1999)**

## **2.5 Impact on academic performance**

In standard models, it is assumed that private tuition must yield substantial returns in terms of learning (Dang & Rogers, 2008). In reality students who engage in private tuition may differ in various unobserved but important dimensions from those who do not take part, such that the gains in terms of their performance may not necessarily be positive. One such dimension is the level of parental concern for their children's' education. It is known that parents strongly oriented to their children education may directly help them, send them for private tuition, provide conducive environment for study and follow up on their performance. Secondly highly motivated students may be more willing to take private tuition and are likely to perform better not necessarily because of private tuition. These unobserved characteristics are not measurable by empirical studies thus leading to mixed findings on the impact of private tuition on performance. Some of the studies that have considered academic implications are highlighted below.

By using the 1995 TIMSS results, Baker et al (2001) reported that 39.6% of the seventh and eighth grade students in the study participated in private tuition with the anticipation of improvement in their mathematics performance. In Luxembourg, the study by Mischo and Haag (2002) reported that 23% of the participants received private tuition in mathematics. In the study, the effectiveness of private tuition was evaluated by using a prepost-control-group design. The results showed that the group that received private tuition showed a large improvement in their performance in mathematics.

In England, a study by Ireson and Rushforth (2011) on private tuition involved students from Years 6, 11 and 13. The purpose of the study was to provide a systematic description of the nature and extent of private tutoring at three points of transition in the English education system and to explore students' views of the reasons for its use. The results showed that 27% of the participants had received private tuition at some stage while in school. Mathematics was the most popular subject followed by English and Science. The main reason for engaging in private tuition was to do well in examinations since these were transition Years.

According to Kuan (2011), the results from the study in mathematics achievement in Taiwan showed that improved performance was higher among motivated students and from higher social classes. The study analysed data gathered by the Taiwan Education Panel Study (TEPS) in 2003. TEPS had previously collected data from the same students in 2001 hence the 2003 data was reliable. Liu (2012) used the same database from TEPS but focussed on the 2001 data. His results showed a significant positive effect of private tuition on analytical ability and mathematics performance, although positive effects decreased with longer tutoring hours. A similar study was done in the Republic of Korea by Byun (2014). He

analysed data collected by the Korean Educational Longitudinal Study (KELS) and concluded that ‘cram schooling’, a form of private tuition that followed the school curriculum and provided practice examinations had significant positive effect on achievements.

In addition, Smyth (2009) indicated that findings from studies on the impact of private tuition on academic performance have been inconsistent and vary nationally. The inconsistencies are attributed to factors such as, type of students in terms of abilities, family background, form of tuition whether individual or group and duration. The studies that indicated positive impacts include (Stevenson & Baker, 1992) indicating that Japanese students who had participated in private tuition had a higher chance of gaining University entry. Buchmann (2002) also found positive impacts on students’ academic performance in Kenya. Tansel and Bircan (2006) found that those who received private tuition performed better in Turkish University entrance examination. In England, (Ireson & Rushforth, 2005) indicated some positive impact of private tuition on performance but the effect varied across subjects and gender. On the other hand, other studies found negative or no effect of private tuition on students’ academic performance. Cheo and Quah (2005) found insignificant impact of private on students’ achievement by Grade 8 students from Singapore. Also, Ha and Harpham (2005) results showed insignificant effects from Vietnam and negative impacts were indicated from Korea (Lee, Kim & Yoon, 2004).

In Africa, the result for the impact of private tuition on students’ performance is from SACMEQ I and SACMEQ II Projects. The overall results from SACMEQ II Project (2000 – 2004) which involved six African countries (Kenya, Malawi, Mauritius, Namibia, Zambia and Zanzibar) suggested a consistent pattern indicating that achievement scores in both reading and mathematics for Grade 6 students were higher for those who engaged in private

tuition. Although at country level, the patterns were inconsistent with Namibia and Kenya indicating negative impact. In Mauritius the achievement score for students taking private tuition was significantly higher than those not taking part which was of concern to the researchers (Paviot et al., 2008).

The literature reviewed has not singled out mathematics as a subject of study but it came out to be the subject on higher demand comparatively. TIMSS survey of which Botswana is a participant is the only study that involves mathematics although data is collected from Form One students from mainstream education. The survey therefore does not provide sufficient information that may be used to analyse the impact of private tuition on academic performance in mathematics.

## **2.6 Private tuition in Botswana**

The main purposes of engaging in private tuition is either for enrichment, a strategy among high achieving students or as a remedial strategy by low achieving students with the hope of improving their performance. As already indicated, the demand for private tuition has increased globally and Botswana is no exception.

In Botswana, the demand and subsequent growth of the phenomenon is evidenced by the increased number of advertisements by either individual tutors or tuition centres in the local publications like the Advertiser which is a free publication. The advertisements are also displayed in notice boards of higher learning institutions such as the University of Botswana and other community centres. At the beginning of the year some tuition centres and individual tutors distribute flyers or post them at the gates of the schools especially the secondary schools.

From the advertisements, the private tutorials range from primary school to tertiary levels. At the primary school level, the private tutorials emphasize revision by use of past papers for Primary School Leaving Examinations (PSLE). One tuition centre claimed that they specialize in Special Education; therefore they accept students with learning disabilities. These students being slow learners, the parents may opt for individual tuition at home or bring the learners to work in groups at the tuition centre. The tutors handling these learners are Graduates with Special Education qualification (Botswana Advertiser, 2016).

The bulk of private tuition in Botswana is at Secondary School level with the private tutors and private tuition centres advertising for the Junior Certificate (JC), Botswana General Certificate of Secondary Education (BGCSE) and International General Certificate of Secondary Education (IGCSE) levels. The clientele at the tuition centres and individual tuition are mostly slow learners from formal schools and mostly those supplementing various subjects at the above certification levels. Those supplementing attend tutorials in the morning and part of the afternoon whilst those from formal schooling attend after school hours, over the weekends, public and school holidays. On the other hand, students performing well also engage in private tuition for enrichment purposes.

The subjects covered during the private tutorials are of a wide range but the most popular ones are Mathematics, Additional mathematics, Physics, Chemistry and Biology. There are also advertisements on languages such Setswana, French and German. The tuition centres as well as the individual tutors emphasize on examination preparation and revision. Some centres go to the extent of guaranteeing improvement in performance by stating that they have the formula as their results speak for themselves. The advertisements describe the tutors

providing private tuition as qualified, professional and experienced. When exposed to a lot of these advertisements on private tuition, students are more likely to show interest and eventually participate. At the tertiary level, the subjects advertised include, accounting, economics, management, statistics, assignment and even dissertations. For these subjects the tutors and tuition centres target University of Botswana, Mancosa and Botswana College of Open and Distance Learning (BOCODOL).

The tuition centres and individual tutors emphasize examination preparations in their advertisements, therefore similar to findings from studies in other countries such as Ireland preparation for the national examinations appears to be one of major reasons for engaging in private tuition. As mathematics is one of the most popular subjects with private tutorials this study sought to find out the factors for the increased demand and the impact on the students' achievements.

## **2.7 Summary**

Although private tuition has a long historical standing especially in East Asia, in recent decades the phenomenon is growing rapidly globally. Due to the rapid increase, researchers are concerned about its far reaching implications to mainstream schooling and to planners and educational policies. Private tuition being a hidden phenomenon, researcher's face a number of limitations since there is hardly any documentation in official statistics (Bray & Kwok, 2003). Most of the studies done have been cross-national hence findings vary nationally. In addition, existing studies on the impact of private tuition on academic performance have not taken into account the potential differences between the students engaging in private tuition in terms of their abilities, how often they attend the tutorials, the content and mode of delivery of the tutorials and how much time they spend as a result the

findings have been inconclusive. It is desirable to do further research that would shed more light as to whether private tuition has an influence on academic performance particularly in mathematics. Presently there is no documentation on private tuition in Botswana. This study sought to establish the reasons why students' attend private tuition and if it has an impact on their academic performance in mathematics.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Introduction**

Literature reviewed revealed a high demand for private tuition to an extent that in countries like Canada it has turned into a huge industry with economic, social and educational implications. Studies done so far have focussed on socio-economic implications, the impact on mainstream schooling and policy issues and a few focussed on the students' academic achievements. The studies on academic achievements cover all subjects and looked at overall impact on performance. This study focuses on the factors for increased demand for private tuition and how it impacts students' performance in mathematics in Botswana. The chapter presents the research methodology which includes, research design, target population and sample, sampling technique, instrument and data collection, validity of the instrument, data collection procedure, data analysis and ethical considerations.

#### **3.2 Research design**

According to Bray (2010), research on private tuition may use quantitative, qualitative or mixed methods. As research methodology evolves mixed methods approach which employs the combination of quantitative and qualitative approaches is gaining popularity (Creswell, 2009). Problems in educational policies, social and health sciences are complex and use of either quantitative or qualitative may be inadequate to address the complexities. As such, there is more insight to be gained from a study by using a combination rather than each one independently. Creswell (2009) outlines the designs in mixed method as either sequential or concurrent. In this study the concurrent triangulation strategy was employed. In this approach, both quantitative and qualitative data is collected at the same time and is compared to identify the similarities. Quantitative research is essentially about collecting numerical data to explain a phenomenon. In this study the phenomenon is private tuition and that certain

questions are best suited to being answered using quantitative methods hence this was employed on the questionnaires completed by the students.

Survey being one of the most common types of quantitative research was employed in the study. Survey research is often used to gather data from large groups of people in a relatively short period of time (Wagner, Kawulich & Garner, 2012). In particular, simple descriptive survey design was used since it provides description of the variables at one point in time. Since the research questions were ‘why’ students attend private tuition and ‘how’ it influences their performance, these types of questions are better answered by conducting a survey. The rationale for using a survey was based on the fact that, there is no documented study on how private tuition impacts students’ performance in mathematics in Botswana. The study will then form a baseline for further research on the phenomenon and its reliability.

### **3.3 Population and sample of the study**

The target population was students in Government and Government aided senior secondary schools, registered private schools offering International General Certificate of Secondary Education (IGCSE) in Gaborone and mathematics teachers. The sample was drawn from four secondary schools in Gaborone, two private and two public schools and only Form Four/Five students were involved. The choice of either Form Four in the case of some private schools or Form Five is because it is a transition point where national/international examinations are written. The mathematics teachers were those teaching the classes in the sample. Literature review reveals that more students tend to engage in private tuition at such points where national and international examinations are written. The private schools in Gaborone offering IGCSE are; Marua-a-Pula School, Westwood International School, Rainbow School, Legae Academy, Livingstone Kolobeng College, Gaborone International School and Al Nur.

Government Senior Secondary Schools in Gaborone are; Ledumang, St. Joseph College, Naledi, Gaborone and Mogoditshane all offering BGCSE (Botswana General Certificate of Secondary Education). BGCSE is the local equivalent qualification for IGCSE Level on the international platform.

### **3.4 Sampling Procedure**

Both probability and non- probability sampling techniques was used to obtain a sample of respondents to participate in the study. Stratified purposive sampling was used to select four schools, two from the private schools and two from the public schools with an attempt to ensure that the sample is representative of the population. The private schools offering IGCSE has the catchment for students mainly from the Primary English Medium Schools. The students would have gone through seven years of primary schooling and to be admitted they write entry tests and are admitted on merit. They may not have to write the Primary School Leaving Examinations (PSLE). For the government schools, catchment is from Junior schools after passing the Junior Certificate Examinations done in Form Three.

The selected schools were coded rather than using their names for confidentiality. From the selected schools, two classes were further randomly selected from the Form Five/Four stream. On average the number of students per class in private schools is 25 and in public schools is 40 therefore the expected sample was 180 students but due to varied reasons there were 159 respondents. Convenience sampling was used to select teachers for the interview. The teachers were those currently teaching mathematics from the selected classes therefore the sample comprised seven teachers.

### **3.5 Instruments**

The study used two instruments, a questionnaire and an interview. The self-completion questionnaire was used to gather information from the students and the interview used to collect information from mathematics teachers from the sampled schools.

#### **3.5.1 Questionnaire**

The advantages of using a questionnaire includes, high representativeness of a large population, low costs, convenience, little or no researcher subjectivity and most importantly precise results if the questions are carefully designed and standardized. The questionnaire items comprised multiple choice and a five-point Likert scale type of questions with; Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5) type of questions.

The questionnaire had three Sections, A, B and C. Section A was demographic information consisting of age, gender and nationality. Section B sought to establish if the students' attended private tuition in primary school, currently attending any form of private tuition or planning to attend in the course of the year. There were five closed-ended questions drafted by applying Principles of effective questionnaire design from Wagner, Kawulich and Garner (2012) which employs the following guidelines, relevance, applicable to the respondent, ordering of the questions, clarity, avoiding double-barrelled questions, making sure that the options are mutually exclusive. Section C consisted of seven closed-ended questions on attending private tuition in mathematics. The format was adapted from a Teacher questionnaire from Horizon Research, Inc (HRI). Horizon Research Inc is a research firm located in Chapel Hill, North Carolina specializing in studies related to Science and Mathematics Education. The reasons for attending private tuition were adapted from Bray

(2007) from studies he did in Hong Kong, Malta and Sri Lanka. The questionnaire was drafted such that it could be completed in 20 – 30 minutes.

### **3.5.2 Interview**

For triangulation purposes a semi-structured interview was conducted for the mathematics teacher from the selected schools. The advantage of the interviews is to obtain in-depth and more comprehensive information on the teachers' views on private tuition in mathematics. An interview guide was drafted by applying guidelines for personal interviews (Mertens, 2010). In the guidelines, the questions ranged from general to specific, open-ended seeking for opinions rather than yes or no. The interview questions sought the teachers' opinion on students' engagement in private tuition in mathematics and its impact on their performance.

### **3.6 Validity of the Instruments**

Validity of a test is the extent to which the test measures what it purports to measure in other words its credibility. The instruments, the questionnaire items and the interview guidelines were appraised by the researcher's supervisor. Contributions and suggestions were then incorporated.

#### **3.6.1 Validity of the questionnaire items**

Face validity refers to the extent to the questionnaire items appear to measure the impact of private tuition on students' performance. Construct validity is the extent to which a test measures the concept or construct that it is intended to measure. For both face and construct validity, the questionnaire items were validated by a supervisor through consultation and necessary adjustments made.

In addition, a pilot study was done that involved administration of the questionnaires in one of the classes not sampled. The respondents were asked to provide comments, suggestions or clarification on any of the items. From the pilot study, Section C required amendment so that it could be completed by respondents who had engaged in private tuition in 2016 and the previous years so that they could compare their performance.

### **3.6.2 Validity of the interview guide**

Similarly, the interview guide was validated by the supervisor and during the pilot study, two teachers were interviewed. Their opinion on the interview guide was sought. Their suggestions and comments were incorporated. The interview guide was also amended by asking the teachers if they had observed any improvement in performance by the students in their classes engaging in private tuition.

### **3.7 Reliability of the instruments**

This refers to consistency and/or repeatability of the measurement. Consistency implies that the questionnaires items should be clear and well defined in order not to confuse the respondents and repeatability refers to the deployment and interpretation of the items in a similar fashion. To ensure reliability, the instruments had been used in a research proposal and necessary adjustments made prior to data collection.

### **3.8 Data Collection**

The researcher obtained permission to conduct the research from the Ministry of Basic Education, Department of Planning and Research Services through The University of Botswana. Thereafter, the researcher visited each of the four schools and made a formal introduction and explained the purpose of the visit. The school administration was then given

time to identify a convenient time for administration of the questionnaires. Once suitable times were identified, the researcher then personally took the questionnaires to the schools. Before the administration of the questionnaires, the researcher introduced herself to the participants and briefly explained the purpose of the study and distributed the letter of consent that also assured the respondents of confidentiality. The questionnaires were distributed and completed within 30 minutes in each of the four schools. The data collection spread over a period of one month.

Similarly permission was sought for the interviews and suitable times agreed upon by the teachers preferably on the day of administration of the questionnaires to save time and minimize costs. The teachers interviewed were very cooperative and provided very informative information towards the study.

### **3.9 Data Analysis**

In a study, the purpose of data collection is to make relevant conclusions about the problem being investigated. For this study, the data collected from the questionnaires was checked for any inconsistencies, incomplete and inaccurate responses. The data was coded and entered in the computer for analysis. The quantitative data from the questionnaires was analysed using Descriptive Statistics. The Descriptive Statistics used included frequency counts, percentages and correlations and was done using the Statistical Package for Social Sciences (SPSS). The results were presented on frequency distribution tables and bar graphs.

In order to answer the research question on increased demand for private tuition in mathematics, frequency counts and percentages was done for the number of students who attended private tuition in primary school, when they were in Form Four and those

anticipating engaging in private tuition when they get to Form Five. The frequency counts were also done according to the subjects they accessed during the tutorials. Similarly, frequency counts were done to establish the reasons for either attending or not attending mathematics private tutorials.

The effectiveness of private tuition depends on variables such as the type of private tuition, frequency of the tutorials, duration and method of instruction. Frequency counts were done on these variables with a view of understanding the nature of the mathematics private tutorials.

To establish the impact of private tuition on students' performance in mathematics, frequency counts and percentages were done from the responses on respondents' performance before and after attending private tuition. In addition, Pearson Correlation Coefficient was calculated to establish the correlation in mathematics performance before and after private tuition. Frequency counts were also done on the ratings of the respondents with regards to their improved performance after attending private tuition.

The analysis for the semi-structured interviews was done by considering the similarities and convergence from the responses on increased demand for private tuition in mathematics and improved performance. These were then compared with the responses from the questionnaires in order to answer the research questions.

### **3.10 Ethical Considerations**

The researcher developed a letter of consent for the participants to read before they engaged in the research. The completion of the questionnaire was voluntary thus participants were not forced to respond to the questionnaire. They were informed that they could withdraw from the research at any point of the research. Anonymity of the participants was assured by them not writing their names. The identity of the participants and any information that may embarrass or harm them would not be disclosed to any person(s). The research data would be confidential and only used for the Research report.

## **CHAPTER 4**

### **DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS**

#### **4.1 Introduction**

The chapter presents findings of the study and the discussion thereof. The purpose of the study was to establish the reasons for increased demand for private tuition in mathematics and how it impacts students' performance. The study was guided by the following research questions:

1. What factors drive the demand for private tuition in mathematics?
2. What is the impact of private tuition on students' achievement in mathematics?

The chapter is divided into six sections with findings based on: Response rate; Demographic data of respondents; Increased demand for private tuition in mathematics; Intensity of private tuition in mathematics; Impact of private tuition on students' performance in mathematics and discussion of findings.

#### **4.2 Response rate**

A total of 167 respondents were sampled for the study; 159 were students and eight (8) mathematics teachers. Since the questionnaires for the students were self administered by the researcher, all the students responded therefore the response rate was 100%. For the semi structured interview, of the eight teachers sampled for the interview, only one was not available. Table 4.1 shows the respondents rate for the students according to gender.

**Table 4.1****Response rate according to gender**

Gender	Number of Students	Percentage
Male	72	45.3
Female	87	54.7
Total	159	100.0

Of the 159 respondents for the questionnaires, 72(45.3%) were males and 87(54.7%) were females.

**Table 4.2****Response rate according to private or public school by gender**

Gender	Type of School		Total
	Private	Public	
Male	39	33	72
Female	50	37	87
Total	89	70	159

Table 4.2 presents response rates from the private and public schools by gender. A total of 89 respondents were from the private schools of which 39 were males and 50 were females. The public schools had 70 respondents of which 33 were males and 37 were females.

### 4.3 Demographic data

**Table 4.3**

**Demographic data comparing gender and age**

		Age					Total
		14	15	16	17	18	
Male	Number of respondents	1	15	36	19	1	72
	Percentage	0.6%	9.4%	22.6%	11.9%	0.6%	45.3%
Female	Number of respondents	4	21	44	17	1	87
	Percentage	2.5%	13.2%	27.7%	10.7%	0.6%	54.7%
Total	Count	5	36	80	36	2	159
	Percentage	3.1%	22.6%	50.3%	22.6%	1.3%	100.0%

Of the 159 respondents, 72(45.3%) were males. Their ages ranged from 14 - 18. Majority of the males were of age 16(22.6%). The females were 87(54.7%). Their ages ranged from 14 – 18. Similarly most of the females were of age 16(27.7%). Table 4.3 shows the demographic data that compared gender and age.

### 4.4 Demand for Private Tuition in Mathematics

The study sought to establish the increased demand for private tuition in mathematics. In an attempt to answer the research question, the respondents were asked if they attended private tuition in primary school, in 2016 and also if they considered taking tutorials in mathematics in 2017 when they are in Form Five/Four.

#### 4.4.1 Private Tuition in Primary Schools

Out of the 159 respondents, 37(23.3%) indicated that they attended private tuition in primary school. Table 4.4 shows the outcome.

**Table 4.4**

**Attendance of Private Tuition at Primary School**

Attendance of private tuition at primary school	Number of students	Percentage
Yes	37	23.3
No	122	76.7
Total	159	100.0

#### 4.4.2 Attendance of private tuition at Primary school by subjects.

The 37 students who attended Private tuition in Primary School also indicated the subjects they accessed. Of the 37 students, there are students who engaged in four (4), three (3), two (2) or only one (1) of the listed subjects. Table 4.5 shows the number of students who accessed the listed subjects.

**Table 4.5**

**Attendance of Private Tutorials in Primary School by subjects**

		Responses	
		N	Percent
Subjects	Mathematics	29	36.7%
	Science	20	25.3%
	English	7	8.9%
	Social Studies	9	11.4%
	Setswana	9	11.4%
	Other	5	6.3%

Responses for the individual subjects indicate that 29(36.7%) undertook mathematics, 20(25.3%) did Science, nine (11.4%) in Social Studies and Setswana, seven (8.9%) in English and five (6.3%) in other subjects. Suggesting that mathematics was the most accessed subject for tutorials.

#### **4.4.3 Attendance of private tuition in primary school according to type of school**

Out of the 37 who attended private tuition at primary school, 14(37.8%) were from the public schools and 23(62.2%) were from the private schools. Table 4.6 shows the outcome.

**Table 4.6**

#### **Private tuition at primary school according to type of school**

Type of School	Primary School private tuition		Total
	Yes	No	
Private	23	66	89
Public	14	56	70
Total	37	122	159

#### **4.4.4 Attendance of Private Tutorials in 2016**

Private tuition is practised at both primary and secondary schools. After joining Senior Secondary School, there are students who engaged in private tuition in 2016. Out of the 159 respondents, 45 (28.3%) indicated that they attended private tuition and 114(71.7%) did not attend. Table 4.7 shows these results.

**Table 4.7****Attendance of private tuition in 2016**

Attendance of private tutorials	Number of students	Percent
Yes	45	28.3
No	114	71.7
Total	159	100.0

**4.4.5 Subjects accessed at private tuition in 2016**

Of the 45 (28.3%) respondents who attended private tuition in 2016, some of the students accessed only one (1) subject, while others had combinations of either two (2), or three (3) or four (4) subjects. Table 4.8 shows the individual subjects and the number of students who accessed them.

**Table 4.8****Students who attended Private Tuition in 2016 and the subjects**

Subjects undertaken during private tutorials	Responses	
	N	Percent
Mathematics	40	49.4%
Science <sup>a</sup>	28	34.6%
Business <sup>b</sup>	4	4.9%
Humanities <sup>c</sup>	4	4.9%
Other languages <sup>d</sup>	3	3.7%
English	2	2.5%

<sup>a</sup> includes Biology, Chemistry and Physics

<sup>b</sup> includes Accounting, Economics, Commerce and Business Studies

<sup>c</sup> includes History, Geography and DVS

<sup>d</sup> includes Setswana, French or Afrikaans

Additional mathematics was included with mathematics.

From the 45 respondents, 40 (49.4%) undertook mathematics private tutorials, 28(34.6%) took Science. Four (4.9%) respondents each took Business and Humanities. Three (3.7%) took other languages and two (2.5%) took English. The results indicate that mathematics remain the most popular subject accessed in tutorials.

#### **4.4.6 Reasons for engaging in mathematics private tuition.**

The purpose of the study was to investigate the demand for private tuition in mathematics. Hence the study sought to find out the main reasons why students engage in mathematics private tuition. Table 4.9 shows the outcome for the 40 students who indicated that they participated in mathematics private tuition in 2016.

**Table 4.9**

#### **Reasons for engaging in mathematics private tuition**

Main reason for engaging in mathematics private tuition	Number of Students	Percentage
I want to obtain higher marks	8	20.0
Poor performance	24	60.0
I do not understand the teacher	3	7.5
Preparation for examinations	2	5.0
Nobody in the family can help	2	5.0
Other	1	2.5
Total	40	100.0

Of the 40 respondents, 24 (60.0%) indicated poor performance as their main reason for engaging in private tuition. Eight (20.0%) respondents engaged so that they could obtain higher marks. Three (7.5%) do not understand what is taught in the class. Preparation for examinations and nobody in the family to help each had two (5.0%) of the respondents.

#### 4.4.7 Reasons for not engaging in private tuition

On the other hand, 114 (71.7%) respondents indicated that they did not engage in private tuition in 2016. Similarly, the study sought to establish the reasons why they do not engage in private tuition. The results are presented in Table 4.10.

**Table 4.10**

#### Reasons for not taking private tuition

Reasons for not taking private tuition	Number of students	Percentage
Performing well at school	19	16.6
Parents cannot afford	15	13.2
I do not have time	14	12.3
I get help from home	15	13.2
I do not know anyone who can help	16	14.0
Other	35	30.7
Total	114	100.0

Responses indicated various reasons with 19 (16.6%) indicating that they are performing well at school. Sixteen (14.0%) indicated that they do not know anyone who can help them, 15 (13.2%) indicated that either they could not afford or get help from home. Fourteen (12.4%) indicated that they do not have time to go for private tuition. Some of the other reasons included:

I do not think that I need private tuition; I know my weaknesses and can help myself; I study at home using past papers, revision notes and internet; I just need to put more effort; Parents take it casually when I talk to them; I have never mentioned it to my parents.

#### 4.4.8 Students considering taking private tuition in Mathematics in 2017.

Of the 159 respondents, 89 indicated that they considered engaging in private tuition in 2017. Representing 56.0% of the respondents, this shows an increase in the number of students

seeking private tuition in mathematics in comparison to those who attended in 2016. Of the 89 respondents considering taking up private tuition, 60 (67.4%) indicated that they would begin in Term1, 25 (28.1%) would begin in Term 2 and only four (4.5%) would start in Term 3. Table 4.11 shows these findings.

**Table 4.11**

**Students considering taking Mathematics private tuition in 2017**

Starting Private Tuition	Number of Students	Percentage
Term 1	60	67.4
Term 2	25	28.1
Term 3	4	4.5
Total	89	100

The findings from Section 4.4 may be used to answer the research question on factors that drive the demand for private tuition in mathematics. Firstly, the number of students who received private tuition in mathematics is higher compared to the other subjects. When in Primary School, 29(36.7%) of the respondents undertook mathematics private tuition and at Senior Secondary School there were 40(49.4%) respondents. At Form Five/Four, 89 (56.0%) of the respondents indicated that they were considering taking mathematics private tuition with majority (60) indicating Term 1 as their starting time.

The popularity and increase in number of students engaged in mathematics private tuition from Primary to Secondary School is a positive indicator to increased demand for private tuition in mathematics especially in the examination classes. The dominant driver for demand for tuition is poor performance followed by desire to obtain higher marks. These reasons are inter-connected in that poor performance leads to low marks which mean failure in the subject. With a large number of students (56.0%) considering taking mathematics private

tuition at Form Five/Four which are examinations classes, this suggests that preparation for the national and international examinations is a driver for taking private tuition in mathematics.

#### 4.5 The Intensity of Private Tuition in Mathematics

The effectiveness of private tuition depends on various factors such that even large international studies such as TIMSS had shortcomings on its impact on performance. However it is worth finding out what happens during the tutorials. The findings in this Section were on the type of tuition the respondents attend, how often they attend the tutorials, the duration and its adequacy, modes of instruction and weekend and holiday tutorials.

##### 4.5.1 Type of Private Tuition

The study sought to find out the type of private tuition the respondents attend. Table 4.12 shows the findings.

**Table 4.12**

##### **Type of Private Tuition**

Type of private tuition	Number of students	Percentage
One-on-one	21	52.5
Small group (2 – 5)	10	25.0
Medium group (6 – 10)	7	17.5
Large group (more than 10)	2	5.0
Total	40	100.0

The type of private tuition varied from one-on- one to large groups. Twenty one (52.5%) of the respondents had personal tutors, 10 (25.0%) attended tuition in a small group of 2 – 5, 7

(17.5%) attended medium group between 6 – 10 students and 2(5.0%) were in a large group of more than ten students. The one-on-one is the most popular type of private tuition.

#### 4.5.2 Frequency of Private Tuition in Mathematics

Respondents were asked how often they attended private tutorials during the week. Figure 4.1 shows the results.

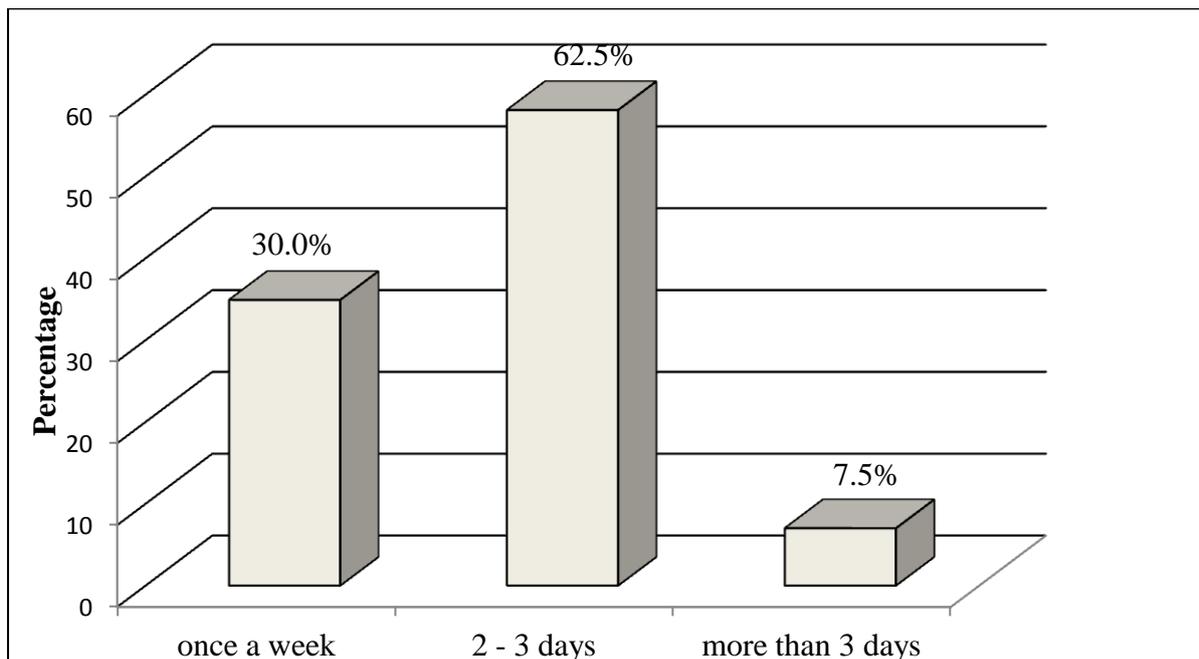


Figure 4.1: Frequency of private tuition

Twenty five (62.5%) of the students attended tutorials between 2 – 3 days in a week, 12 (30.0%) attended once a week and 3 (7.5%) attended more than three days in a week. Most the students had their tutorial between 2 to 3 days.

### 4.5.3 Duration of Private Tuition

The respondents indicated the durations of the private tutorials as presented in Table 4.13.

**Table 4.13**

#### **Duration of the private tutorials**

Duration per session	Number of students	Percentage
1hr	7	17.5
1-2hrs	8	20.0
2 hrs	21	52.5
More than 2 hrs	4	10.0
Total	40	100.0

Majority of the students 21(52.5%) spent two hours at the private tutorials and only four (10.0%) spent more than two hours. Seven (17.5%) spent one hour and eight (20.0%) spent between one to two hours.

### 4.5.4 Adequacy for the duration for private tutorials

Respondents were asked if they are satisfied with the number of hours they spend during their mathematics private tutorials. The findings are presented in Table 4.14.

**Table 4.14**

#### **Adequacy of the duration for the tutorials**

Students satisfied by the time spent during private tutorials	Number of students	Percentage
Responses Yes	34	85.0
No	6	15.0
Total	40	100.0

Of the 40 respondents, 34(85.0%) indicated that they were satisfied and only six (15.0%) were not satisfied by the durations of their mathematics private tutorials.

#### **4.5.5 Weekends, Public and School Holidays tuition**

Other than week days, the respondents were asked if they attend private tutorial other days of the week. Table 4.15 presents the findings.

**Table 4.15**

#### **Weekends, public and school holidays' tuition**

Other days for private tuition	Responses	
	N	Percent
Weekends	25	69.4%
Public holidays	2	5.6%
School holidays	9	25.0%
Total	36	100.0%

Attendance of private tuition is largely done over the weekends by 25 (69.4%). Only two (5.6%) attend during public holidays, whilst nine (25.0%) attend during school holidays.

#### **4.5.6 Main method of instruction during the mathematics private tuition**

Although the respondents were asked to indicate their main method of instruction during the tutorials, some indicated more than one so the coding was done under multiple responses.

Table 4.16 shows the results.

**Table 4.16****Method of instruction during mathematics tutorials**

Method of instruction	Responses	
	N	Percent
Using workbooks	6	10.7%
Doing homework	2	3.6%
Revision using past papers	26	46.4%
Learning current topics from school	16	28.6%
Learning new topics	5	8.9%
Other	1	1.8%
Total	56	100.0%

The popular method of instruction was revision using past papers with 26(46.4%) of the respondents. Learning current topics from school was the next popular method with 16(28.6%). Six (10.7%) indicated use of workbooks, five (8.9%) learned new topics, two (3.6%) were helped with homework and one used other methods.

**4.6 The Impact of private tuition on students' performance in mathematics**

The study sought to establish the impact of private tuition on students' performance in mathematics. To be able to answer this research question, the respondents were asked to rank their performances before and after attending private tuition. Secondly by using a five point likert scale from strongly disagree to strongly agree, the respondents were asked to indicate if their performance had improved by attending private tuition.

**4.6.1 Performance in mathematics before attending private tuition.**

Respondents who enrolled for private tuition in secondary school in 2016 were asked to rate their performance in mathematics prior to taking private tuition. Table 4.17 shows the students' performance levels.

**Table 4.17****Performance before attending private tuition**

Performance level	N	Percentage
Poor	31	77.5
Average	7	17.5
Good	2	5.0
Excellent	0	0.0
Total	40	100.0

Of the 40 students, 31(77.5%) indicated that their performance was poor, seven (17.5%) performed averagely, two (5.0%) had good performance and none had excellent performance.

**4.6.2 Performance in mathematics after attending private tuition**

The ratings of the respondents performance after attending private tuition is presented in Table 4.18.

**Table 4.18****Performance after attending private tuition**

	N	Percentage
Poor	6	15.0
Average	13	32.5
Good	17	42.5
Very good	3	7.5
Excellent	1	2.5
Total	40	100.0

Good performance was perceived by 17(42.5%) of the respondents, 13(32.5%) felt that their performance was average. Six (15.0%) felt that their performance was poor and only one indicated excellent performance.

### 4.6.3 Improved performance in mathematics by attending Private Tuition

Students also indicated their levels of performance based on attendance of private tuition.

Table 4.19 shows the results.

**Table 4.19**  
**Improvement in performance**

Responses regarding improved performance	N	Percentage
Disagree	7	17.5
Neutral	13	32.5
Agree	12	30.0
Strongly agree	8	20.0
Total	40	100.0

Seven (17.5%) disagreed, 13(32.5%) were neutral, 12(30.0%) agreed and eight (20.0%) strongly agreed that private tuition made an improvement in their performance in mathematics.

### 4.6.4 Correlation between performance in mathematics before and after private tuition

In order to investigate if private tuition has any impact in performance in mathematics, a correlation coefficient between performance before and after private tuition was calculated.

Table 4.20 shows the findings.

**Table 4.20****Correlations in mathematics performance before and after private tuition**

		<b>Correlations</b>	
		Performance before private tuition	Performance after private tuition
Performance before private tuition	Pearson Correlation	1	.223
	Sig. (2-tailed)		.167
	N	40	40
Performance after private tuition	Pearson Correlation	.223	1
	Sig. (2-tailed)	.167	
	N	40	40

The Pearson Correlation coefficient is 0.223. Using the Correlation Coefficient guidelines, the value lies between 0.21 and 0.4. The conclusion is that the correlation is positive but weak.

The findings regarding improvement on performance in mathematics by attending private tuition is not very conclusive based on the fact that the students rated their own performance which could be biased. Secondly, 50% of the respondents either agreed or strongly agreed that private tuition had an impact on their performance. A percentage of over 50% would have been more convincing in answering the research question. Thirdly, the correlation between performance before and after attending private tuition is weak showing that the intervention which is private tuition has not produced a significant change in performance.

#### **4.7 Findings from interviews with mathematics teachers**

The purpose of the interviews was to find out the teachers' opinions on students' increased engagement in private tuition and if it has any impact on their performance in mathematics. Eight teachers were sampled for the interview but only seven were available. Teachers interviewed were very experienced with at least five years and a maximum of 19 years of teaching mathematics.

##### **4.7.1 Students' attitudes toward learning mathematics**

Teachers interviewed indicated that the attitudes students have toward learning mathematics included; being a difficult subject, impossible to understand concepts, overwhelmed by the structured questions at secondary school having been assessed by multiple choice at primary school. Some of the students have good attitudes, but are demoralised by their poor performance in the subject. Others feel that mathematics is one of the most important subjects to study and an admission ticket for universities and future careers so they work hard to achieve good grades.

##### **4.7.2 Engagement in mathematics private tuition**

All the teachers interviewed indicated that they have had students in their classes that attended mathematics private tuition but did not have any discussions with them about it.

##### **4.7.3 Increased demand for private tuition in mathematics**

According to the respondents, some of the factors that may lead to increased demand for private tuition included: teaching methods, students feeling good having individual attention, students being free to ask questions with the tutors. Increased demand for higher education and qualifications makes students seek for help in order to achieve their goals. Private tuition

helps students remain competitive so that they may gain admission into prestigious schools and universities. Large number of students in classes hinders individual attention thus students seek one-on-one contact which is more beneficial especially to the low achievers. Belief that private tuition leads to improved performance. Here are some of the responses by the mathematics teachers on increased demand for private tuition:

The cause is basically a pre-conceived idea and belief that mathematics is different. Also the foundation for most of our students is very poor. Above all mathematics being one of the subjects that has become a pre-requisite in most courses and programmes, one is forced to have it.

The increased demand is due to the need to excel or at least pass the subject.

Belief that private tuition improves performance.

Students having poor background in mathematics and hence find themselves struggling to cope.

#### **4.7.4 Attending private tuition and improved performance in mathematics**

The teachers agreed that private tuition can be beneficial if done correctly, also to students who have positive attitudes it boosts their morale. On the other hand, students who attend without any commitment may not benefit. Secondly the methodologies used may cause confusion that deters improvement in performance. One of the respondents had the following to say:

In some cases private tuition might help: cases where a student is just slow and requires more individual attention which is not always possible in schools. For students who are just lazy and not willing to work, the private tuition is a waste of time and money. So if a student is willing to work, then private tuition could help in improving performance.

Another respondent said:

Private tuition allows students to work and learn at a comfortable pace. As teachers in schools are hard-pressed to find time to work with individual students, some students' the classroom environment can be unproductive. Having a tutor to assess and support a student on a one to one basis can heighten intellectual curiosity.

#### **4.7.5 Recommendation for mathematics private tuition**

The opinions expressed by teachers interviewed were twofold: That students should be encouraged to get help from school and on the other hand private tuition is recommended because it helps to develop positive attitudes toward learning mathematics. Secondly, that one-on-one tutorial is beneficial especially for low achievers. Some of the responses were:

I usually would not encourage students to go for private tuition, with the exception of one or two students who would need more individual attention, but then it would depend on their attitude towards work.

Yes if they are slow learners and no if they can be able to utilize their school time fully.

I would recommend students to engage in tuition. It can be beneficial to the growth and development of a student, whether it is a higher or lower achieving student.

#### **4.7.6 Practising private tuition by the teachers**

Five of the teachers indicated that they do practise private tuition. The tutorials are done after hours, over the weekends and during school holidays. The tutorial sessions are between one to two hours. The methods used for the tutorials include: working on past papers, topical discussions and helping with homework.

The mathematics teachers interviewed, concurred with the findings from the students that there is increased demand for private tuition in mathematics. They mentioned various reasons as the possible causes for the increased demand. Firstly, the belief that private tuition improves performance could be a possible drive to the increase as (77.5%) of the students also indicated that they engaged in private tuition due to poor performance. Secondly the teachers are willing to recommend private tuition especially to low achievers. Being part of the system, such recommendation would encourage the students to seek private tuition.

On improved performance, the teachers indicated that this can only be achieved by commitment of the tutee and only if the tutorials are done correctly. This implies that private tuition does not necessarily improve performance in mathematics. This conclusion concurs with the findings from the students.

#### **4.8 Discussion of findings**

The purpose of the study was to establish what factors drive the demand for private tuition in mathematics and if the tutorials have any impact on performance.

The findings from the study suggest increased demand for mathematics private tuition especially at Senior Secondary School. The increased demand is attributed to poor performance, implied preparation for national and international examinations and competition for admission into programmes/courses that requires mathematics as a pre-requisite.

From the findings, more students engaged in mathematics private tuition as compared to the other subjects. Of the 37 respondents who attended private tuition in primary school, 29 took mathematics. At Senior Secondary School, of the 45 who attended private tuition, 40 took mathematics and at Form Five/Four level 89 respondents indicated that they were considering

taking private tuition in mathematics. These results show a steady increase in the number of students anticipating engaging in private tuition especially at Form Five when national and international examinations are written. According to Bray (1999) students tend to receive more intensive private tuition at secondary than at primary schools. In addition, the demand is greater at levels leading to major examinations which agree with the findings from this study. Furthermore, a study done by Tseng (1998) showed that mathematics was the most popular subject among senior secondary school students in Taiwan as nearly half of her sample engaged in private tuition in mathematics.

The increased demand is mainly attributed to poor performance, as 60.0% of the respondents indicated poor performance as their main reason for attending private tuition. Although preparation for examinations was only indicated by 5.0% of the respondents, it is implied as a drive for demand for private tuition based on the number of respondents were considering attending private tutorials at Form Five.

The interviews responses with the teachers also indicated that the demand for tuition in mathematics is higher due to varied reasons. One of the reasons is the belief that by attending mathematics private tuition the students' performance would improve. Secondly by attending private tuition students gets individual attention especially for those attending one-on-one tuition. Such personalised attention is hindered by large number of students' in the classroom. Competition for joining programmes or courses where mathematics is a prerequisite at institutions of higher learning is also a possible factor for demand for private tuition. With poor performance, the chances for acceptance into such programmes are reduced. Such students are under pressure to achieve higher grades and may therefore make greater use of private tuition.

The effectiveness of private tuition may depend on other factors such as; type of private tuition, frequency of the tutorials, duration and mode of instruction. The findings indicate that the preferred type of private tuition is one-on-one as compared to larger groups. Personalised private tuition is believed to be more effective as the tutee gets individual attention that they may not get in school. Majority of the respondents (62.5%) attended tutorials 2 – 3 days in a week with a duration of 2 hours being popular. Other than week days, the bulk of private tuition in mathematics is done over the weekends and the main method of instruction during the tutorials was revision using past papers. Although private tuition is predominantly meant to bring positive gains, taking tutorials after school, over the weekend and school holidays and for longer hours raises the concern of fatigue experienced by the students and even the tutors from the mainstream schools. Furthermore, the method of instruction is mainly using past papers, implying drilling for examinations as opposed to learning mathematical concepts. Under such circumstances the gains may be negative.

To investigate the impact of private tuition on improved performance in mathematics, the respondents were asked to rate their performance before and after attending private tuition.

The rating by the students before engaging in private tuition was largely poor performance at 77.5%. After engaging in private tuition, 42.5% indicated good performance, 15.0% still had poor performance and only 2.5% indicate excellent performance.

Of the 40 students attending private tuition, 12 (32.5%) agreed and eight (20.0%) strongly agreed that their performance in mathematics had improved by attending private tuition. Seven (17.5%) disagreed that their performance had improved. Only 20 (50.0%) of the respondents agreed that their performance had improved by attending private tuition. Since

there are students who disagreed that their performance had improved, it may not be convincingly concluded that attending private tuition improves performance. Likewise, findings from the interviews with teachers were that private tuition may not necessarily improve performance due to varied factors. For positive gains, the students require positive attitudes, the type of tuition, for example for one-on-one tutorials the method of instruction is tailored to the needs of the student allowing the tutor to develop a good knowledge of the students, strength and weaknesses. Just mere attendance of private tuition without commitment may not produce positive gains.

This mixed reaction confers with findings from various studies that reported shortcomings on the impact of private tuition and improved performance. Positive impacts were recorded in Germany (Mischo & Haag, 2002); Japan (Stevenson & Baker, 1992), Kenya (Buchmann, 2002) and Vietnam (Ha & Harphan, 2005) and negative impact was recorded in Korea (Lee, Kim & Yoon, 2004). Other national studies include: a study of mathematical achievement for Grade 9 students in Taiwan by Kuan (2011) which found that positive gains was greater among students who were motivated. A related study by Liu (2012) found significant positive effects in mathematics performance but the effects decreased when tutoring was done for longer durations. Byun (2014) did a similar study in the Republic of Korea where he analysed mathematics achievement for students moving from Grade 7 to Grade 9. However, he assessed the roles of different forms of private tuition separately. These included: cram schooling that focuses on intensive examination preparations, individual or group tutoring, mail-based correspondence courses, internet tutoring and the government's Educational Broadcasting System (EBS) courses. He found that cram schooling had a significant positive effect on achievement in comparison to the other forms of private tuition. The mixed results

from the findings of the above studies and other international, national and small scale studies calls for the need for further research on the effectiveness of private tuition on performance.

## CHAPTER 5

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

Private tuition is a worldwide phenomenon whose demand has been growing especially in East Asia (Bray & Lykins, 2012). This study aimed at establishing factors that influence increased demand for private tuition and its impact in performance in Mathematics at Senior Secondary Schools in Gaborone. This Chapter presents the Summary, Conclusion and Recommendations of the study.

#### 5.2 Summary

As the demand for private tuition increases worldwide, what are the distinctive features of the phenomenon in Botswana? In recent years there have been increased advertisements for private tuition in local newspapers and emergence of tuition centres especially in urban centres such as Gaborone. This study sought to explore the factors for increased demand for private tuition and its impact on students' performance particularly in mathematics.

Private tuition has become the focus for educational researchers due to its magnitude globally. Studies done have focussed on, educational policies, economic or social implications and implications on academic performance by employing various methodologies. Such studies include (Stevenson & Baker, 1992; Bray, 1999; Bray & Kwok, 2003; Ireson & Rushforth, 2005) among others. In this study, and for the purposes of triangulation, mixed method approach was employed and the design was descriptive survey. The sample was drawn from four (4) Senior Secondary Schools in Gaborone, two (2) private and two (2) public schools. The selection of the schools was by Stratified Purposeful sampling; Convenience sampling for the teachers and simple random sampling for the

students. The sample for the study comprised 159 students and seven (7) mathematics teachers. The sample size was a limitation to the study and could have been higher by including more schools.

The instruments for the study were questionnaires for the students and semi-structured interviews for the teachers. In order to answer the research question on increased demand for private tuition in mathematics the questionnaire items required the respondents to indicate if they attended private tuition in primary school, in 2016 and if they intended to attend private tuition particularly in mathematics in 2017. For the factors that drive for the increased demand, the respondents were required to select the main reason why they attended mathematics private tutorials. Similarly the teachers were asked for their opinion on the causes of increased demand for mathematics private tutorials. On improved performance in mathematics by engaging in private tuition, the respondents rated their performance before and after attending private tuition. By using a five point likert scale, the respondents also indicated how private tuition had influenced their performance in mathematics. For the interviews, the teachers were asked about their opinion on the belief that engaging in private tuition improves performance in mathematics.

The researcher visited the schools to discuss convenient times for the data collection. At the agreed times, the researcher went to the schools, distributed the questionnaires which were completed and collected. The data collection process went on well at the private schools, but at the public schools there were challenges as the researcher had to make several visits to one of the schools despite having agreed on a convenient time. For the interviews, the teachers were cooperative, although some gave very brief responses due to time factor.

The quantitative data from the questionnaires was analysed using Descriptive Statistics, to assist in responding to the two research questions. The Descriptive Statistics used included frequency counts, percentages and correlations and was done using the Statistical Package for Social Sciences (SPSS). The results were presented on frequency distribution tables and bar graphs. The analysis for the semi-structured interviews was done by considering the similarities and convergence from the responses on increased demand for private tuition in mathematics and improved performance.

The findings of the study were based on the factors that cause the demand for private tuition in mathematics, the characteristics of the tutorials in terms of the type of private tuition, duration, frequency and the methods of instruction. The findings also established whether engaging in private tuition has an impact on performance.

Increased demand for private tuition in mathematics, of the 159 respondents, 29(36.7%) attended mathematics private tuition while in Primary school. Forty (50.0%) students attended private tuition in mathematics in 2016, 89 (56.0%) of the respondents were considering engaging in private tuition in mathematics in 2017 when they are in Form Five/Four which is a transition class. This suggests that the motive of the students to engage in private tuition is preparation for the final examinations BGCSE/IGCSE. Of the subjects covered at the private tutorials, mathematics was the most popular subject at the private tutorials in both primary and secondary schools. The mathematics teachers' interviews findings concurred with the findings from the students that there is an increased demand for private tuition in mathematics. They mentioned various reasons as the possible causes for the increased demand. Firstly, the belief that private tuition improves performance could be a possible drive to the increase as 24 of the students indicated that they engaged in private

tuition due to poor performance. Based on the belief, by engaging in private tuition the students are hopeful of improved performance. Secondly there was a feeling that the students are having limited background in the subject that could be attributed to the teaching methods at primary and secondary levels hence the poor performance. Thirdly they may not be receiving sufficient individual attention due to large number of students in the class and therefore seek for individual private tutorials. Due to increased demand for higher education, competition for admission especially in programmes where mathematics is a pre-requisite have arisen and this may cause the students to engage in private tuition with a hope of improving their performance thus gaining admission for their desired courses or programmes. With the teachers' willingness to recommend private tuition especially to low achievers, parents and students would be heeding their advice thereby looking for private tutors which leads to increased demand.

The main reason for engaging in private tuition was poor performance indicated by 60.0% of respondents who attended mathematics private tuition. Twenty (20.0%) engaged so that they could obtain higher marks, 7.5% indicate that they do not understand the teachers. Five (5.0%) indicated that they attend private tuition to prepare for examinations and a similar number indicated that they have nobody in the family to help them. For those not engaging in private tuition, they were either performing well in mathematics (16.6%), parents' could not afford (13.2%), they do not have time (12.3%), they are getting help at home (13.2%) or they did not know anyone that could help (14.0%). The results reveal that poor performance is the main factor for the increased demand for private tuition in mathematics.

In order to understand what happens at the private tutorials, the following were considered: the type of private tuition, frequency at the tutorials, duration, when the tutorials are held and

what method of instructions are used. A large number (52.5%) of the students attended one-on-one private tuition and only 5.0% attended in large groups of more than ten. Majority (62.5%) of the students' had their tutorials between 2 – 3 days in a week. Durations of the tutorials ranged from one hour to more than two hours with 52.5% spending two hours. Asked if they were satisfied with the durations, 85.0% indicated that they were satisfied. The private tutorials are mostly done over the weekends and least over the public holidays. Mode of instruction is mainly revision using past papers indicated by 26 (46.4%) of the respondents followed by learning current topics from school by 16 (28.6%), 10.7% indicated using workbooks

On the impact of private tuition on improved performance, the students' rated their performance in mathematics before attending tutorials and the highest was poor performance with 77.5%, 17.5% indicated average and only 5.0% indicated good performance. The results for the ratings after attending private tuition were such that, 32.5% rated average, 42.5% rated good performance and 2.5% rated excellent performance. As to whether private tuition had influenced their performance, 20.0% strongly agreed and 30.0% agreed that their performance had improved by attending private tuition. On the other hand, 32.5% were neutral and 17.5% disagreed that private tuition had made an impact on their performance in mathematics. These findings reveal that 50.0% of the respondents agreed that private tutorials had made an impact on their performance. The rating of their performance in mathematics before and after attending private tuition and also on improved performance by the respondents was a limitation to the study as the students may have not genuinely quantified their performance. The results could have been more accurate by using actual marks they obtained in tests and examinations during 2016.

The interview responses suggest that improved performance is only possible with positive attitudes; mere attendance may not yield positive gains. These results reveal that attending private tuition does not necessarily guarantee improved performance. These findings concur with findings from various studies that reported shortcomings on the impact of private tuition and improved performance. Positive impacts were recorded in Japan (Stevenson & Baker, 1992), Kenya (Buchmann, 2002) and Vietnam (Ha & Harphan, 2005) and negative impact was recorded in Korea (Lee, Kim & Yoon, 2004).

The rationale in engaging in private tuition in mathematics is basically to improve performance. Positively private tuition bridges the gap in the mainstream schooling by providing supplementary assistance, reinforcing what is done in school and preparation for examinations for students. If this is done efficiently then improved performance may be achieved. Since not everyone goes for private tuition because of the economic implications, the mainstream schooling system still has a bigger role to play in alleviating the performance in mathematics in the country.

It is also argued that private tuition may have negative implications by distorting the curriculum in the mainstream education depending on the contents delivered and the qualifications of the tutors. The distortion of the curriculum has implications on policy issues. Secondly, since students attend after school and over the weekends, this causes fatigue and the well intended results may not be achieved. From the study, by considering the response of the students that they would take up private tuition in Form Five/Four is an indication that students are utilizing private tuition in preparation for the final examinations.

### **5.3 Conclusions**

The findings from the study show that there is increased demand for private tuition in mathematics by considering the number of students who engaged in the tutorials when in primary school and onto the senior secondary school. Twenty nine (29) of the respondents attended private tuition in mathematics in primary school, 40 attended in 2016 at senior secondary school and 89 were considering taking private tuition in Form Five/Four. This shows a steady increase in the number of students as they progressed to a major transition class when International and National examinations are written. Although preparation for examinations was not indicated as a major reason for engaging in private tuition, it is indirectly implied by the number of students considering taking private tutorials in Form Five/Four. As such, the need for higher academic achievement for competitive examinations would lead to increased demand. Furthermore, in comparison to other academic subjects accessed during private tutorials, mathematics was the popular subject at both primary and secondary levels. The popularity may be due to the fact that it is a core subject and also a prerequisite for some courses and programmes at tertiary level and a pass in the subject is therefore mandatory.

The dominant factor for the demand for private tuition in mathematics was poor performance. Poor performance may be attributed to several other factors such as: ineffective classroom teaching, learner attitudes, lack of individual attention in the classrooms due to a large class size, lack of study skills and motivation among others. Since the respondents were from both private and public schools, poor performance is therefore evident in both settings and due to the confounding factors it requires further research.

Effectiveness of private tuition is influenced by the type of tuition, frequency, duration and content. From the study, one-on-one was the most preferred type of private tuition, where the students received personalised attention as opposed to larger groups that may reduce the private tuition to a normal classroom situation. The frequency at the tutorials was 2 – 3 days in a week for most of the students and duration of two (2) hours. Bearing in mind that the tutorials are done after school, more days and longer hours would lead to fatigue and not much gain from the tutorials. In addition, students attended the tutorials mostly over the weekends and revision using past papers was the main mode of instruction especially with the examination classes. Revision using past papers amounts to drilling for the examinations and not much attention may be given to the content coverage of the curriculum. This could be a possible reason for the insignificant improvement in performance in mathematics.

Only half of the students indicated that they were of the opinion that their performance in mathematics improved by attending private tuition. Due to its' privateness, the quality of private tutorials is not known especially the tutor qualifications, experience and methods of instructions. As a result, mere attendance of private tuition may be counterproductive. In addition, the mathematics teachers' also affirmed that improvement can only be attained by having positive attitudes, motivation and commitment. With this in mind it may be concluded that attendance of private tuition does not necessarily improve performance as other factors have to be considered.

## **5.4 Recommendations**

The following recommendations are based on the conclusions from the study:

- (a) Schools to be encouraged to strengthen the remedial sessions especially for low achieving students in mathematics as private tuition has financial implications that not all parents can meet.
- (b) Parents and students to be sensitized to appreciate that private tuition does not guarantee academic improvement. If they opt to engage in it then the students' must be fully committed.
- (c) Since poor performance was eminent in both private and public schools, the Ministry of Basic Education, administrators from private schools and other stakeholders should hold consultative meetings to establish the causes of poor performance in mathematics nationally.

## **5.5 Recommendations for further research**

Findings from this study are indeed preliminary and need to be supported by further research.

The researcher recommends further research in the following areas:

- (a) A longitudinal study in Gaborone involving more senior schools for a larger sample.
- (b) The study to be replicated in other cities and towns like Francistown and Lobatse.
- (c) A study comparing private tuition in urban and rural settings.
- (d) A similar study that uses class tests over a period of time to measure student performance.

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## APPENDICES

### Appendix A

#### Letter to the Director, Ministry of Basic Education

To: The Director,  
Ministry of Basic Education  
Research Division  
Gaborone.

Dear Sir/Madam

#### **RE: PERMISSION TO CARRY OUT RESEARCH**

I would like to request for permission to carry out a research on the “Impact of Private Tuition on Students’ Performance in Mathematics”. I am a Master’s student in the Faculty of Education, Mathematics and Science Education at the University of Botswana.

The research is to enable me write my Research Essay and it requires me to collect data from sampled senior schools in Gaborone in order to establish if private tuition has any influence on mathematics performance. The data collection is scheduled for January - Februarys 2017.

Thank you

Yours faithfully

Milka Jimbo (Mrs)

Student No. 201406269

**Appendix B**

**Letter to the Principals**

The Principal

.....  
.....

Gaborone

Dear Sir/Madam

**Re: Permission to carry out Research**

My name is Milka Jimbo, I am a Masters student in the Faculty of Education, Mathematics and Science Education, University of Botswana. I am conducting a study on “The Impact of Private Tuition on Students’ Performance in Mathematics.

Your school has been randomly selected to participate in the study that will involve two Form Five Classes. The students will be required to fill a questionnaire that will take about half an hour.

I hereby request for permission to carry out the research at a convenient time for you in the course of the week.

Thank you.

Yours Sincerely,

Milka Jimbo

## **Appendix C**

### **LETTER OF CONSENT**

#### **Dear Respondent**

My name is Milka Jimbo, I am a Masters student in the Department of Mathematics and Science Education, Faculty of Education, University of Botswana. I am conducting a study on the **“Impact of Private Tuition on Students’ Performance in Mathematics”**.

The purpose of the study is to establish the reasons why students engage in private tuition in mathematics and the impact it has on their performance.

You are kindly requested to complete the attached survey questionnaire. It should take you 20 to 30 minutes to respond to the survey. Please answer all the relevant questions. Should you have any problems or questions concerning the study, feel free to talk to the researcher.

Please be assured that your confidentiality and anonymity shall be ensured. Your privacy shall be strictly kept throughout the study, during presentations and any publications. The name of your school will also not appear in any write up. After completion of the study, the data shall remain confidential until the final results for the Research Essay is published, after which it will be destroyed by incineration.

Your cooperation is highly appreciated. I wish to thank you in advance for taking part in this exercise.

Yours Sincerely,

Milka Jimbo

## **Appendix D**

### **Consent Form**

I hereby confirm and understand the explanations of the contents of this document and the nature of the study above. I voluntarily consent to participate in this research. I know that I am free to withdraw from the study should I so desire.

-----  
Signature of participant

-----  
Date

## **Appendix E**

### **SURVEY QUESTIONNAIRE FOR STUDENTS**

#### **The Impact of Private Tuition on Students' Performance in Mathematics**

School Code.....

#### **SECTION A: DEMOGRAPHICS DATA**

A1. Gender: Circle 1. Male 2. Female

A2. Age at your last birthday.....

A3. Are you a citizen of Botswana? Circle 1. Yes 2. No

#### **SECTION B: ATTENDANCE OF PRIVATE TUTORIALS**

B1. Did you take any private tutorials in Primary School? Circle 1. Yes 2. No

If you answered No, proceed to question B3.

B2. If you answered Yes, for which subject(s) did you take the tutorials? Tick the appropriate box(es).

1.  Mathematics

2.  English

3.  Science

4.  Social studies

5.  Setswana

6.  Other

If other, please specify.....

B3. Did you attend any private tutorials in 2016? Circle 1. Yes 2. No

If you answered No, go to question B6 and B7 and tick the appropriate box(es)

B4. If you answered yes, for which subject(s) did you take the tutorials? Tick the appropriate box(es).

- 1.  Mathematics
- 2.  English
- 3.  Science (includes Biology, Chemistry and Physics)
- 4.  Business (includes Accounting, Economics, Commerce and Business Studies)
- 5.  Humanities (includes History, Geography and DVS)
- 6.  Other languages (Setswana, French, Afrikaans)
- 7  Other

If other, please specify.....

B5. In which of the above subject(s) are you going to take private tutorials in 2017?

- 1.  Mathematics
- 2.  English
- 3.  Science (includes Biology, Chemistry and Physics)
- 4.  Business (includes Accounting, Economics, Commerce and Business Studies)
- 5.  Humanities (includes History, Geography and DVS)
- 6.  Other languages (Setswana, French, Afrikaans)
- 7  Other

If other, please specify.....

B6. What is your **main** reason for not taking private tuition?

- 1.  I am performing well at school
- 2.  My parents cannot afford
- 3.  I do not have time
- 4.  I get help at home
- 5.  I do not know anyone who can help me
- 6.  Other

If other, please specify.....  
.....  
.....

B7. Are you considering taking private tuition in mathematics in 2017?

- 1.  Yes
- 2.  No

B8. If you answered yes, when are you most likely to **start** private tutorials in mathematics?

Tick one box only.

- 1.  1<sup>st</sup> Term
- 2.  2<sup>nd</sup> Term
- 3.  3<sup>rd</sup> Term

**SECTION C: PRIVATE TUITION IN MATHEMATICS**

Please answer the following questions if you attended private tuition in mathematics in 2016.

Put a tick in the appropriate box.

C1. What was your **main** reason for taking private tuition in mathematics? Tick one box only.

1.  I want to obtain higher marks
2.  My performance is not good
3.  I do not understand when the teacher teaches in class
4.  Preparation for examinations
5.  My parents want me to attend the tutorials
6.  No one in my family can help me in mathematics
7.  Because my friends attend tutorials
8.  Hard to say
9.  Other

If other, please specify.....  
 .....

C2. What was the nature of your private tuition?

1.  one to one (personalised tutor)
2.  Small group (2 – 5students)
3.  Medium group (6 – 10 students)
4.  Large group (more than 10 students)

C3. How would you rate the nature of your private tuition in C2?

Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
1	2	3	4	5

C4. How many times a week did you attend mathematics private tutorials?

1.  Once a week

2.  2 – 3 days
3.  More than 3 days

C5. How long were your private tutorials sessions?

1.  Less than one hour
2.  1 hour
3.  1 - 2 hours
4.  2 hours
5.  More than 2 hours

C6. Was the number of hours above adequate for your private tutorials?

1.  Yes
2.  No

C7. Other than week days, which of these time(s) did you attend private tutorials?

1.  Weekends
2.  Public Holidays
3.  School holidays

C8. What was the main method of instruction used during your private tutorials?

1.  Using workbooks
2.  Doing homework
3.  Revision using past papers
4.  Going through current topic being done in school
5.  Learning new topics

6.  Other

If other, please specify.....

.....

C9. Were you satisfied with the method used in your private tutorials?

1.  Yes

2.  No

C10. How would you rate your performance in mathematics before taking the private tutorials?

Poor	Average	Good	Very Good	Excellent
Below 50%	50% - 60%	60% - 70%	70% - 80%	Above 80%
1	2	3	4	5

C11. Do you think that your performance in mathematics has improved by attending private tutorials?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

C12. How would you rate your performance after attending the private tutorials?

Poor	Average	Good	Very Good	Excellent
Below 50%	50% - 60%	60% - 70%	70% - 80%	Above 80%
1	2	3	4	5

## **Appendix F**

### **Interview guide for mathematics teachers**

1. How long have you been teaching mathematics?
2. How are your students' attitudes toward learning mathematics?
3. Do you know of any students in your class that engage in private tuition in Mathematics?
4. There seems to be an increase in demand for private tuition especially in mathematics. What do you think is the cause for increased demand?
5. Students' engage in private tuition believing that their performance in mathematics will improve. What is your opinion about that?
6. Based on your experience would you recommend students to engage in private tuition in mathematics?
7. Do you practise private tuition in mathematics?
  - When do you have the tutorials?
  - Where do you have the tutorials?
  - How long are the sessions?
  - What method(s) do you use for the tutorials?