# How Distance to School and Study Hours after School Influence Students' Performance in Mathematics and English: A Comparative Analysis

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Abstract

Mathematics and English are essential subjects of the education system globally, as they provide skills for everyday human life. Mathematics and English are core subjects in the senior secondary education program in Botswana. The performance of students in Botswana in mathematics and English over the years has been poor. Most students travel long distances to school and have to return home every day. The distance to school and the hours after school for studying may contribute to the poor performance of students in these subjects. This quantitative study determined the influence of the distance to school and after school study hours on the performance of senior secondary students in mathematics and English in Botswana. Data were collected through a survey of a random sample of 168 students learning mathematics and English in senior secondary schools in Botswana. Findings of analyses of variance indicated that study hours after school and the distance to school have a significant influence on the performance of students in mathematics, whereas no influence was determined on student performance in English. Further, Post Hoc analysis determined that the long travelling distance and low number of hours of after school study had a sizeable adverse influence on student performance in mathematics. To improve student performance in mathematics, it was recommended that stakeholders should ensure that students stay closer to school and had better, more reliable transport. The former can be achieved by increasing the amount of hostel accommodation in schools.

Keywords: Academic performance, Distance to school, Mathematics, Secondary schools, Study hours, Travelling distance.

Contents

Contribution of this paper to the literature
This is the first empirical study comparing the influence of distance to school and study hours after school on the performance of students in senior secondary schools in Botswana. The findings of the study shall help in improving the poor performance of students in mathematics and English in the country. It was recommended to the stakeholders to ensure that students stay in close proximity of the schools; preferably in hostels in schools or ensure a reliable transport to school.

1. Introduction

Academic performance of students is one of the indicators of quality education, and this has been declining in Botswana (Government of Botswana, 2015; UNESCO, 2015). This decline has become a matter of grave concern to the nation (Bulawa, 2017). However, the government of Botswana has been working hard to facilitate improved outcomes for all learners by addressing several challenges of quality education in the country. These challenges include lack of qualified teachers, ineffective teachers, irrelevance of the curriculum, low morale among teachers, large classes, lack of teaching aids, declining enrolment, retention of students, negative attitude among students, high drop-out numbers, and lack of practical skills (MoESD Ministry of Education and Skills Development, 2015; Oketch, 2017). All these challenges contribute to poor academic performance and skill development among the students. Academic performance refers to the ability to grasp the essentials of a subject, which is reflected in the percentage marks obtained through valid and reliable testing methods. In this study, the performance of students refers to percentage marks with Grade C or higher (Botswana Examinations Council, 2016).

Mathematics and English education are considered the two most important subjects in the education system worldwide, as these are integral to every step we take in human life. Mathematics is a subject whereby understanding of the numbers is obtained in order to enhance numerical ability. English as a language subject equips students with skills in reading, writing, speaking, and communicating. It is thus implied that mathematical and English knowledge would be utilised in the acquisition of practical and applied skills in sustainable human life. Therefore, mathematical and English education are emphasised at all levels of education, from primary to tertiary levels. Mathematics and English are offered as core subjects in the government senior secondary schools in Botswana through the Botswana General Certificate of Secondary Education (BGCSE) curriculum. Tertiary institutions in the South African Development Community (SADC) region normally require pass or credits in senior secondary mathematics and English as entry requirements. While reviewing examination results over the years, it is clear that the performance of students in mathematics and English has been poor when compared with other subjects (Botswana Examinations Council, 2010, 2015, 2019). The academic performance of students in senior secondary mathematics and English has not only been poor but has also continually declining or stagnant for some years. The students' performance in senior secondary mathematics deteriorated from 60.18% to 40.52% between 2007 and 2011 for Grade C and higher (Botswana Examinations Council, 2011). Most recently, in 2018, out of the total grades awarded in mathematics, only 28.41% were Grade C or higher. This is lower than the percentage of these grades obtained in 2010 (29.34%) (Botswana Examinations Council, 2019). The performance of students in mathematics reveals an overwhelming downturn which is worth noting, beyond reasonable doubt (Nyroos, Jonsson, Korhonen, & Eklöf, 2015). The performance of students in English has almost the same, stagnant trend in Botswana. Table 1 reflects the declining or stagnant trends in student performance in mathematics and English in senior secondary schools in Botswana.

Table-1. Declining trend in students' performance in the senior secondary mathematics and English in Botswana.

Year	Performance (% of Grade 'C' or better)	
	Mathematics	English
2010	29.34	17.31
2012	27.61	15.37
2014	22.64	17.07
2016	27.47	24.42
2018	28.41	23.11

Poor performance, particularly in mathematics, continues to be a concern among the students, teachers, and other stakeholders. There may be several factors affecting performance, including demographic factors such as gender, location of residence, teacher attitudes, teacher qualifications, parents' education, distance to school, and socio-economic status. Numerous factors have been identified by researchers for the inconsequential performance by students, some of which include a shortage of qualified mathematics teachers, and poor facilities, equipment and instructional materials for effective teaching (Avong, 2013; Umameh, 2011; Yemi & Adeshina, 2013). Evidence from research has also shown that long distances travelled to school are among the major reasons why students perform poorly and eventually drop out of school (Arubayi, 2005; Ebinum, Akamagune, & Ugbong, 2017). A number of studies have been conducted on poor performance, particularly in mathematics, in developed countries, but there has been scant literature on this problem in developing countries, particularly in Botswana. Therefore, this study was an attempt to determine the influences of the distance to school and study hours after school on the performance of senior secondary students in mathematics and English in Botswana. The study was useful to the stakeholders, including students, parents, school management, and policymakers as the findings provided important information about the aforementioned influences which should help in improving student performance in the country in these two subjects.

1.1. Aims and objectives

This study was an attempt to determine the influence of the distance to school and study hours after school on the performance of senior secondary students in mathematics and English in Botswana. The specific objectives of the study were:

1. To determine the influence of distance to school on the performance of students in mathematics and English.

2. To determine the influence of study hours after school on the performance of students in mathematics and English.

The objectives of the study were translated into the following questions:

1. To what extent does distance to school influence the performance of students in mathematics and English.

2. To what extent do study hours after school influence the performance of students in mathematics and English.

To answer the research questions, the following null hypotheses were formulated:

H_{o1}: *The distance to school has no significant influence on the performance of students in mathematics and English.*

H_{o2}: *The study hours after school have no significant influence on the performance of students in mathematics and English.*

2. Review of literature

The distance that students travel from home to school has been an issue of interest to numerous studies over the years. Unanimously, these studies confirm that commuting students are affected to some extent, both health-wise and educationally. The categorisation of travel modes for student commutes in different parts of the world is in two types; active and passive modes of travel from home to school. According to Easton and Ferrari (2015), a passive or non-active mode of travel is characterised by the use of motorised forms of transport such as cars, buses, minibuses, taxis, and trains, while active modes of transport consist of using bicycles, skateboards, and simply walking. However, the passive or non-active mode is not entirely passive when students walk to and from a terminal or station to catch a bus, minibus, taxi, or train.

International literature on active commuting to school, particularly in advanced countries like the United States, is growing because of the potential benefits of active commuting as a form of physical exercise (Easton & Ferrari, 2015; Hinchson et al., 2014; Vuri, 2007). Although there are some differences amongst developed countries in the use of active and passive modes of transport; the conditions and situations are distinct between the advanced and developing countries. The effects of active and passive modes of transports are far less hazardous when compared with the developing countries where students walk long distances for hours, sometimes in the dangerous and difficult terrain of mountains, rivers, and forests. In most advanced countries, passive or motorised transport is modern, relatively safe, and affordable, in sharp contrast with the poor, scarce, or non-existence of safe motorised transport in developing countries (The New Times, 2016). Long walking distance is a common phenomenon that students endure, and it poses psychological and physical repercussions and health hazards. Studies have found that community students suffer from fatigue and low morale that may lead to dropping out of school or poor concentration in class after spending long hours on the road to get there, and home again(Marique, Dujardin, Teller, & Reiter, 2013). Waking up early and returning home late severely limit students' time for private studying. Further, commuting distance has a profound effect on the sleep patterns of adolescent school students (Pradhan & Sinha, 2017).

The literature further confirms the effects of distance to school on students' performance (Easton & Ferrari, 2015; The New Times, 2016; Vuri, 2007). Thapa (2015) and Getachew (2018) reported that distance to school has a significant influence on students' performance. Creswell and Creswell (2017) determined that the distance from school has a negative influence on the academic performance of students. Idowu (2016) found a positive correlation between distance from students' home to the school and students' performance in mathematics which further determined that there is a significant effect on performance in mathematics of those who travel a long distance to school. Arubayi (2005) also reported similar findings that there was a correlation between the students' performance and distance from home to school. Mhiliwa (2015) found that a long walking-distance to school affected students' performance as compared with those who stay within a short distance of the school. Ebinum et al. (2017) revealed that there is a significant relationship between the distance lived from school and the academic achievement of male students, while no significant relationship between school distance and academic achievement was determined for the female students. Falch, Lujala, and Strom (2011). He and Giuliano (2018) declared that distance to education institutions affects participation in education and later outcomes, wherein the increase in real travel time from a student's home to the school decreases the probability of graduating on time. Contradicting this conclusion, Camello (2014) also determined no significant difference in the student's performance when they were grouped according to the distance of their school from their place of residence.

Distance to school may influence student performance through a variety of factors associated with long-distance travel to and from school (Thomas, 2016). Students travelling substantial distances to school would be exposed to longer time spent in transit, which may detract from the time they can spend on homework or preparing for the next day of school (Andre-Bechely, 2007). Nelson, Misra, Sype, and Mackie (2016) reported that students who live further away from a school find it difficult to complete outside-school tasks requested by their teachers. Waswa (2015) found that long distances hinder girls from continuing school, and this contributes to a failure to complete their class and homework. Moyo (2013) stated that walking over long distances to and from school might lead to arriving at school late and getting back home late after school. It was also indicated that longer walking distances cause fatigue and hunger, leading students to drowsiness during learning sessions. Walking over long distances to school disadvantages students in arriving at school late having already lost a considerable amount of energy, leading to poor concentration on their school work. Mhiliwa (2015) determined that longer distances travelled made students reach schools tired and unprepared for the classroom and their private studies. Consequently, poor preparation in school sessions and private studies impacted students and caused failures in their national examinations. Mhiliwa (2015) indicated that students who walk or travel further to reach school could be tempted by distractions on the way to or from school, particularly students from poor families who cannot afford to hire transport to reach schools earlier. Travelling or walking long distances to school also distracts students in a way that facilitates pregnancies in girls and juvenile behaviours in boys. Further, he reported that theft of students' belongings on their journeys is common, which disturbs the students mentally and also influences their performance (Mhiliwa, 2015). Onderi, Kiplangat, and Awino (2014) indicated that walking long distances to school meant students reached their destination with empty stomachs, and were often late, which reflected adversely on their academic performance. Taiwo (2019) determined that walking long distances to and

from school on a daily basis has a negative impact on students' academic performance as it could promote absenteeism and fatigue leading to lack of concentration and interest in school activities, with indirect negative results of delinquency and lack of discipline.

Whether a distant school is chosen or not is determined by parents' school preferences and their willingness to travel (He & Giuliano, 2018). In England, one of the most important factors in parents' first choice of school is proximity to home, where 25.56% of parents place this at the top of their priorities in school selection. (Burgess, Greaves, Vignoles, & Wilson, 2009). Akhtar (2012) advised parents to enrol their children in schools nearer their home because a longer travel distance negatively affects the achievements of their children. Mandic et al. (2017) found that a shorter distance to school and the importance of a school's proximity to home were associated with enrolment in the closest secondary school. Therefore, it was also advised that the government should ensure that more schools are built to reduce the distance students have to travel to get an education. Idowu (2016) suggested that the government should start considering providing school buses for students to reduce the time they take travelling to and from school

Distance to school and study hours after schools are negatively correlated, and both of these factors influence the performance of students. Several recent studies have found that study hours have a positive influence on the academic performance of students (Hallo, Tixi Torres, Piñas, & Zhining, 2020; Piza, Alexis, Galarza, Barahona, & Nivela, 2019; Rodríguez Tapia, Caguanco Almeida, Portilla, & Coca Freire, 2019) and Silva, Hidalgo, Garcés, and Riofrio (2019); Ali, Kiani, and Ahmed (2018) and Nonis and Hudson (2010). Conversely, Ng, Zakaria, Lai, and Confessore (2016) uncovered a negative and significant correlation between time spent reading and academic achievement, whereas a positive and substantial correlation between time spent studying and academic achievement was revealed. Further, it was indicated that the possible reason for this outcome is that the school examinations mainly test mainly a student's knowledge of their academic subjects. Thus the reading materials have less impact on their academic achievement. A similar finding was reported by Zahyah (2008), who found that reading hours did not correlate with the academic achievement of students. Thus, empirical research investigating the relationship between study hours and student performance has delivered mixed results (Krohn & O'Connor, 2005; Lahmers & Zulauf, 2000; Ng et al., 2016; Nonis & Hudson, 2010).

To date, the relationship between distance to school, study hours after school, and student performance remains unclear and under-researched (Andre-Bechely, 2007; Ledwith, 2009; Thomas, 2016; Warrington, 2005). It is uncertain how travelling distances to school for one's education may impact a student's achievement (Andersson, Malmberg, & Osth, 2012; Ledwith, 2009; Wells, Warner, & Grzesikowski, 2013). Further, there is no subject-specific study on the influence of travelling distance and study hours after school on students' performance in Botswana. Therefore, this study was conducted to determine the influence of the distance to school and study hours after school on the performance of senior secondary students in mathematics and English in Botswana.

3. Methodology

This quantitative study adopted a positivism paradigm as the best solution because the researcher was interested in quantifying the data (Creswell & Creswell, 2017). Further, the outcomes of positivism are exploratory, and facts are uncovered from reality. This study is to determine the influence of distance to school and study hours on students' performance. A correlational research design was employed. This design was deemed appropriate as it allows the measurement of two or more variables and their relationship. The method helped in the attempt to expose the relationship to and influence of distance to school and study hours after school on the performance of students in senior secondary mathematics and English. Distance to school and study hours after school were considered as independent variables, and the performance of students was treated as the dependent variable.

The population of the study was the final year students in senior secondary schools in Botswana studying mathematics and English. A sample of 168 students was selected through a random sampling method. A survey design was employed for data collection. Data were collected using a pre-structured, valid, and reliable questionnaire. The questionnaire contained two sections; section one provided information on the demographic variables of distance to school and, study hours after school, section two focused on the performance of the student in mathematics and English which was considered as measured by the examination marks in mathematics and English. Data were collected in two phases. In the first phase, the questionnaires were given to the sampled students to provide information on section one of the questionnaire. In the second phase of data collection, the examination marks of sampled students in mathematics and English were collected from the school records. One-way analysis of variance was performed for analysing data using SPSS Software Ver. 23.

4. Results and discussion

4.1. Participant demographic information

The demographic information of the respondents is presented in Table 2, which indicates that a total of 168 students, 80 males and 88 females, participated in this study. 36.3% of students obtained less than 49% marks in mathematics, while in English only 14.3% of students obtained less than 49% marks. Further, 24.4% and 32.1% of students achieved marks over 70% in mathematics and English, respectively. The majority of students (approximately 59%) travelled to school for less than eight kilometres per day, and only 15.5% of students travelled for more than 16 kilometres per day. The same percentage of students (31.5%) studied at home for more than 16 hours and less than eight hours per week, while 15.5% and 58.9% of students respectively travelled over 16 km and less than eight km to school every day. The data on travelling distance to school and study hours after school indicated that whether students travelled more or fewer kilometres to school, their study hours remained the same. Thus the travelling distance to school does not influence study hours after school.

Table-2. Demographic characteristics of the participant students (n=168).

Characteristics	Levels	f	%
Gender	Male	80	47.6
	Female	88	52.4
	Total	168	100.0
% Marks obtained in mathematics	≥ 70	41	24.4
	50 − 69	66	39.3
	≤ 49	61	36.3
	Total	168	100.0
% Marks obtained in English	≥ 70	54	32.1
	50 − 69	90	53.6
	≤ 49	24	14.3
	Total	168	100.0
Study hours after school per week	≥ 16	53	31.5
	9 − 15	62	37.0
	≤ 8	53	31.5
	Total	168	100.0
Travel distance to school km/day	≥ 16	26	15.5
	9 − 15	43	25.6
	≤ 8	99	58.9
	Total	168	100.0

4.2. Influence of distance to school on students' performance in mathematics

A one-way Analysis of Variance (ANOVA) was used to determine the influence of distance to school on the students' performance, whereby distance to school and performance of students were considered as independent and dependent variables, respectively. Means and standard deviations of the (ANOVA) of the influence of distance to school on students' performance in mathematics are shown in Table 3.

Table-3. Means and standard deviations of analysis of variance of influence of distance to school on students' performance in mathematics.

Level of distance	n	Mean	SD
≥ 16	26	52.47	20.27
9 − 15	43	55.11	17.62
≤ 8	99	62.19	17.05
Total	168	54.65	19.35

Table 3 indicates that between the three levels of distance to school, the longer distance had the lowest mean performance (x = 52.47), followed by the medium distance (x = 55.11). The shorter distance to school had the highest mean performance in mathematics (x = 62.19). Thus, there is a negative relationship between the distance to school and the performance of students in mathematics. In order to discover if the differences in the mean were statistically significant or not, a one-way ANOVA was performed.

The test for normality, examining standardised skewness and the Shapiro-Wilks tests, indicated that the data were normally distributed. Additionally, homogeneity of variances was not significant, *Levene's F(2,753) = 2.777*, p = .063, indicating that the assumption underlying the application of the ANOVA was met. The results of the ANOVA of the influence of distance to school on students' performance in mathematics are presented in Table 4.

Table-4. Analysis of variance of influence of distance to school on students' performance in mathematics.

Level of distance	SS	df	MS	F	p
Between	1956.832	2	978.416	2.665	.043
Within	60577.144	165	367.134		
Total	62533.976	167			

Table 4 reflected that the differences in the means of the performance of students in mathematics were statistically significant F(2, 165) = 2.665, p = .043). It interpreted that the distance to school had a significant influence on student performance in mathematics. This discovery is similar to the findings of Thapa (2015); Easton and Ferrari (2015) and Getachew (2018) who determined that the distance to school has a significant influence on student performance.

Post Hoc comparisons using Tukey procedures were used to determine which pair of the levels of distance means differed. The results of the Post Hoc test are presented in Table 5.

Table-5. Post Hoc test results of the influence of distance to school on students' performance in mathematics.

Level of distance	Mean	Mean Differences		
		High	Medium	Low
High	52.47	__		
Medium	55.11	2.641	__	
Low	62.19	9.717*	7.076	__

Note: *p < .05.

Table 5 indicated that only the students with short (low) and long (high) distances to school had significant differences in their performances in mathematics. There is a higher difference in the performance of students in mathematics who travel longer distances than those who travel shorter distances (9.717). This finding translates that the higher the travelling distances, the lower the performance of students in mathematics. Therefore, there is a negative influence of travelling distances on student performance in mathematics. The findings are similar to

Pradhan and Sinha (2017); Idowu (2016) and Mhiliwa (2015) who determined that the distance from school has a negative influence on the academic performance of students, and students who travel a long distance to school perform poorly when compared with those who stay within the school or at closer locations.

Literature shows that commuting students suffer from fatigue as well as loss of concentration (Moyo, 2013; Taiwo, 2019) and lack of sleeping time (Pradhan & Sinha, 2017), due to long hours spent on the journey. Further, travelling long distances every day does not allow students time to attend to their studies at home (Nelson et al., 2016), and therefore commuting students perform poorly in mathematics. Mathematics is a subject which requires learners to apply high levels of concentration and energy to acquire the necessary knowledge and mathematical skills and, thus, to perform better.

4.3. Influence of distance to school on students' performance in English

A one-way ANOVA was used to determine the influence of distance to school on performance in English. Means and standard deviations of the ANOVA of the influence of distance to school on students' performance in English are shown in Table 6.

Table-6. Means and standard deviations of analysis of variance of influence of distance to school on students' performance in English.

Level of distance	n	Mean	SD
≥ 16	26	67.07	12.37
$9-15$	43	70.39	13.72
≤ 8	99	69.54	13.39
Total	168	69.38	13.29

Table 6 indicates that among the three levels of distance to school, a longer (high) distance had the lowest mean performance (x = 67.07), while the medium and low level of distances to school had similar means of performance (approximately x = 70), which were both higher than the performance mean of students travelling for longer distances. Thus, there is a negative relationship between the levels of distance to school and the performance of students in English. In order to find out if the differences in the mean are statistically significant or not, a one-way ANOVA was performed.

The results of the ANOVA of the influence of distance to school on students' performance in English are presented in Table 7. It was found that the differences in the means of performance in English were not statistically significant $F_{(2, 165)} = .520$, p = .595). The interpretation is that distance to school had no significant influence on student performance in English. This result is similar to the findings of Camello (2014), who determined that the distance to school has no significant influence on students' performance.

Table-7. ANOVA of influence of distance to school on students' performance in English.

Level of distance	SS	df	MS	F	p
Between	184.948	2	92.474	.520	.595
Within	29324.671	165	177.725		
Total	29509.619	167			

4.4. Influence of study hours after school on students' performance in mathematics

A one-way ANOVA was used to determine the influence of study hours after school on students' performance, whereby study hours after school and the performance of students were treated as independent and dependent variables respectively. Means and standard deviations of the ANOVA of the influence of study hours after school on students' performance in mathematics are shown in Table 8. This indicates that among the three levels of study hours after school, the high level of study hours had the highest mean of students' performance (x = 62.60) followed by the medium level of study hours (x = 53.14). The low level of study hours had the lowest mean of students' performance in mathematics (x = 48.47). Thus, there is a positive relationship between the levels of study hours after school and students' performance in Mathematics.

Table-8. Means and standard deviations of analysis of variance of influence of study hours after school on students' performance in mathematics.

Level of study hours	n	Mean	SD
≥ 16	53	62.60	17.33
$9-15$	62	53.14	20.61
≤ 8	53	48.47	17.26
Total	168	54.65	19.35

In order to find out if the differences in the mean of students' performance are statistically significant or not, a one-way ANOVA was performed. The results of the ANOVA of the influence of study hours after school on the performance of students in mathematics are presented in Table 9. It was found that the differences in the means of performance were statistically significant; $F_{(2, 165)} = 7.98$, p = .000). The interpretation is that the study hours after school had a significant influence on the performance of students in mathematics, and this finding is supported by the findings of Ali et al. (2018).

Further, most of the higher-performing students prefer to study alone as they do not want any interruptions while learning (Al Shawwa et al., 2015), and such an environment for study can more easily be availed at home.

Post Hoc comparisons using Tukey procedures were used to determine which pair of the levels of study hours means differed. The results of the Post Hoc test are presented in Table 10, which indicates that the means of performance are significantly different between high and medium levels of study hours ($M = 9.458$), and between high and low levels of study hours ($M = 14.13$). It further indicates that the greater the difference in study hours,

the greater the difference in performance Students who studied for fewer hours showed no significant difference in their performance in mathematics.

Table-9. ANOVA of influence of study hours after school on students' performance in mathematics.

Level of study hours	SS	df	MS	F	p
Between	5516.396	2	2758.198	7.982	.000
Within	57017.580	165	345.561		
Total	62533.976	167			

Table-10. Post Hoc test results of the influence of study hours after school on students' performance in mathematics.

Level of Study Hours	Mean	Mean Differences		
		High	Medium	Low
High	62.60	—		
Medium	53.14	9.458*	—	
Low	48.47	14.132*	4.673	—

Note: *p < .05.

The finding reflected that a higher level of study hours after school (≥ 16 hours) had a significantly greater influence on the students' performance in mathematics than the medium level of study hours. This result is supported by the findings of Barbarick and Ippolito (2003), who determined that more study hours have a significant positive influence on students' performance.

4.5. Influence of study hours after school on students' performance in English

A one-way ANOVA was used to determine the influence of study hours after school on the performance in English. Means and standard deviations of the ANOVA of the influence of study hours after school on students' performance in English in Table 11 indicate that among the three levels of study hours after school, the higher hours of study had the highest mean of students' performance (x = 73.13), followed by the medium level of study hours (x = 68.71). The lower level of study hours had the lowest mean of students' performance in English (x = 68.45). Thus, a positive relationship between the levels of study hours after school and the performance in English was determined. A similar finding was reported by Ali et al. (2018).

Table-11. Means and standard deviations of analysis of variance of influence of study hours after school on students' performance in English.

Level of study hours	n	Mean	SD
≥ 16	53	71.13	12.33
9 − 15	62	68.71	13.69
≤ 8	53	68.45	13.81
Total	168	69.38	13.29

In order to find out if the differences in the mean of students' performance were statistically significant or not, a one-way ANOVA was run. The results of the ANOVA of influence of study hours after school on the performance of students in English are presented in Table 12. It was found that the differences in the means of performance were not statistically significant $F_{(2, 165)} = .675$, $p = .511$). It interpreted that the study hours after school had no significant influence on the performance of students in English. A similar finding was reported by Zahyah (2008).

Table-12. ANOVA of influence study hours after school on students' performance in English.

Level of study hours	SS	df	MS	F	p
Between	239.434	2	119.717	.675	.511
Within	29270.185	165	177.395		
Total	29509.619	167			

Both subjects, mathematics and English, require substantial practice for learners to comprehend them and meet the required proficiency. Although English as a core subject needs plenty of practice, mathematics depends more on instruction in school, and comparatively, students engage more frequently in English than any other school subject, with the exception of teaching and learning of a vernacular language. Perhaps this may explain the difference between the two subjects. Additionally, mathematics is relatively technical and falls in the category of complex subjects which require much practice for a student to perform better. Further, there is a correlation between the distance to school and study hours after school. The longer the distance to school, the more the hours of study after school are reduced as the students take time to travel to school and back to home.

5. Conclusion and recommendations

The findings of the study concluded that the study hours after school had a significant influence on the performance of students in mathematics, while no significant influence was established on the performance of students in English. Further, more study hours after school had a significantly greater influence on the students' performance in Mathematics than a medium level of study hours after school. The distance to school has a significant influence on the performance of students in mathematics. However, the performance of students in English was not influenced by the distance to school. Furthermore, shorter (low) and longer (high) levels of the travelling distance to school had a significant influence on the students' performance in mathematics. Conclusively, the findings revealed that study hours after school and the distance to school both have an influence on students' performance in mathematics, while students' performance in English was not influenced.

It was recommended that policymakers and parents should ensure that the children stay closer to the school to avoid wasting time in travelling, enabling them to have more hours to study, particularly after school. The extra hours are necessary to improve the performance in mathematics. As there are only 33 senior secondary schools in Botswana, it is not always possible for a parent to select, and admit their child to, the school nearest to their home. Therefore, it was further recommended that new schools should be established in various strategic locations in the country to reduce the distance which students have to travel to school. Increasing the provision of hostel accommodation within the school campus is also recommended. Alternatively, school buses can be arranged for transporting students to and from schools to reduce the wastage of travelling time.

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