THE GEOGRAPHICAL ANALYSIS OF SECONDARY SCHOOL DROPOUTS IN BOTSWANA

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Abstract

This study used secondary data from the Statistics Botswana report for the year 2019 to assess spatial distribution of secondary school dropout (n= 2,201) in Botswana. School enrolment was used to measure access to education while quality was measured using the number of teachers and the number of those who are trained, as well as student-classroom ratio. Efficiency was measured using variables school dropout and number of repeaters. Analysis was done using multiple linear regression and geographically weighted regression (GWR). The findings showed that truancy was the leading (45.4%) cause of dropouts followed by pregnancy (29.2%) and other undisclosed reasons (12.7%). The highest secondary school dropout was found in rural and semi-urban districts ranging from 4-10%. Dropping out of school was elevated due to having special needs (β1.23; p 0.008) and decreased with having trained teachers (β-0.162 ; p 0.007). These findings illustrate that high school dropout in rural and semi-urban districts warrant specific interventions in these areas.

Keywords: School dropout, Botswana, geographically weighted regression, rural districts, positivist approach

1.0. Introduction

School dropout has become a major global concern in both developing and developed countries. Dropping out of school is regarded to be a serious problem as it deprives early school leavers of their fundamental right to education which is a means to attaining other human rights (United Nations (UN), 2001). The right to education is recognized in several international treaties and conventions including the 1994 Convention on the Rights of the Child and the 1990 World Conference on Education for all (United Nations Educational, Scientific and Cultural Organisation (UNESCO), 2000). Access to universal education is also reflected in the 2030 global Sustainable Development Goal 4, target 4.1 which aims to ensure that every child of school going age has access to free, equitable and quality primary and secondary education by 2030 (UNESCO, 2017). There is, however, a consensus that the school dropout phenomenon has peaked globally and has turned into a major global challenge for the modern-day education sector (Wotherspoon, 2004; Bridgeland et al., 2006; Oghuvbu, 2008).

According to a report by the UN (2020), before the outbreak of the Covid-19 pandemic, over 200 million children would no longer be enrolled in school and only 60% of the youth globally would be able to successfully complete secondary education by 2030. In Botswana, the latest secondary education brief statistics indicate that over 2000 students dropped out of school in 2019 (Statistics Botswana, 2022). Statistics from previous years indicate that the country has been contending with the problem for a while as evidenced by the high secondary school dropout rates from those years (Statistics Botswana, 2022). Due to the detrimental impact that school dropout has on both individuals and the society, school dropout has to be a major concern for every member of society (Maton & Moore, 2009). In this regard, school dropout should be regarded as a community matter rather than a problem that solely impacts an individual.

Numerous studies have since been conducted to determine the causes of school dropout. Grade repetition and being older than the typical age for a given grade are two common factors that frequently predict school dropout (Brown & Forcheh, 2014; De Witte et al., 2013; Entwisle et al., 2004; Entwisle et al., 2005; Bowers, 2010; Bowers et al., 2012; Rumberger & Larson, 1998). By virtue of being the oldest in class and having repeated several grades, one is highly susceptible to stigmatization (Herbert & Reis, 1999) and other factors linked to school dropout such as pregnancy (Meekers & Ahmed, 1999; Herbert & Reis, 1999; Chilisa, 2002; Grant & Hallman, 2008; Stoner et al., 2019; Rosenberg et al., 2019). Additionally, learners with special learning needs are prone to school dropout (McWhirter et al., 2017; Eron & Emong, 2017). Physical disability may cause a student to drop out of school as some learning institutions are unable to meet the special learning requirements of disabled learners (Mukhopadhyay et al., 2012). In South Africa, it has also been observed that in addition to learning disabilities, lack of foundational courses in literacy and numeracy skills due to insufficient enrollment in early childhood programs, or poor quality of early childhood education disadvantages children from a young age since they tend to struggle as they move up school grades (Spaull, 2015). Such students inevitably leave school in the future. Additionally, it has been suggested that large class sizes and inadequate learning materials such as desks, chairs, and textbooks, which are a basic requirement for conducive learning to occur contribute to school dropout (Dichaba, 2013; Gondwe, 2016; Meke, 2012).

Educators have also been blamed for students' decision to leave school (Spaull, 2015; Mokibelo & Moumakwa, 2006; Pansiri, 2008). Some teachers' inadequate training, low morale at work because of low salaries, taking on other jobs, and inadequate lesson planning translate into poor teaching methods (Ekstrom et al., 1986; Mokibelo & Moumakwa, 2006; Pansiri, 2008; Spaull, 2015). These factors result in reduced dedication to students' academic and learning needs, which subsequently affects the students' motivation to learn as well as their perceptions of and attitudes about education (Amphiah & Adu-Yebaoh, 2009). Children affected by such circumstances tend to regularly miss class until they eventually drop out of school (Amphiah & Adu-Yebaoh, 2009). Moreover, students remain committed to learning if they are offered a diverse school curriculum which embraces their cultural backgrounds, careers goals and future aspirations (De Witte et al., 2013). According to Pinnock (2016, p. 235), adopting a school curriculum that is skewed towards academics and "the western view

of what kind of knowledge is important" may cause students to lose interest in school and eventually drop out. A curriculum that places greater emphasis on technical subjects such as Mathematics and Science and disregards practical subjects such as Art makes it challenging for students who are not gifted in these areas to remain engaged in their schoolwork and to succeed academically (Dichaba, 2013).

In the context of Botswana, the primary cause of some pupils' lack of interest in school is the medium of instruction utilized by teachers in public schools across the country (Batane, 2018). Students who reside in remote areas typically come from minority ethnic groups and speak languages other than Setswana (national language) or English (official language) as their first language (Batane, 2018; Chebanne, 2022). The only officially recognized languages used in Botswana's educational system are English and Setswana. This causes these students to have difficulty in understanding the material presented in class, which eventually has an impact on their grades and further demotivates them from pursuing formal education (Le Roux, 1999; Mokibelo & Moumakwa, 2006; Sekere, 2011). Moreover, in order to retain their cultural identity and as a requirement for their children's academic success, parents of students originating from marginalized ethnic groups tend to prefer an education system that mimics their way of life and their indigenous knowledge systems (Le Roux, 1999). However, Botswana's current education system solely considers the major (Tswana) ethnic group when developing the school curriculum, ignoring the marginalized ethnic groups. This has impacted how learners from these communities learn especially those in remote settlements (Molefe et al., 2001; Nyati-Ramahobo, 2003; Sekere, 2011).

Furthermore, current reference materials in schools such as the graphics used in referred textbooks mirror urban lifestyles and a student belonging to the Khoe and San ethnic groups, for instance, may not be able to relate to the concept being taught in class through the use of such illustrations. One of the major causes of the exclusion of some ethnic groups from the school curriculum in Botswana is the Revised National Policy on Education (R NPE) of 1994, also known as Education for Kagisano (Education for Social Harmony). The policy issued from the submissions of White Papers of the 1977 and 1993 National Commissions on Education (NEC) and was developed in order to address issues of access, equity, and the relevance of the school curriculum to Botswana's economic development. Jotia and Pansiri (2013) argue that in terms of building a new nation distinct from the colonizers, Education for Kagisano was a well rounded policy. However, Education for Kagisano failed to take into account the multicultural and diverse nature of ethnic groups in Batswana (Jotia & Pansiri, 2013). In contrast, the policy envisioned Botswana as a monocultural society. As a result, the education system in Botswana has up to this point taught students to identify with the dominant (Tswana) ethnic group (Jotia & Pansiri, 2013). The division and sidelining of other ethnic groups as a result of the philosophical failures of Education for Kagisano to embrace intercultural education has resulted in some students dropping out of school (Jotia & Pansiri, 2013). Another argument put forth as to why students in remote areas of Botswana drop out of school is that they do not comprehend the importance of education in their daily lives (Mandevu, 2009; Pansiri, 2008). In addition, several behaviors displayed by some teachers in schools across Botswana such as having sexual relationships with learners and excessive use of corporal

punishment have also been cited as the cause of poor school attendance and performance by some learners (Bennell & Akyeampong, 2007; Tafa, 2002).

Students who leave school prematurely end up failing to obtain a grade level completion certificate (Ajaja, 2012). Reduced political awareness, increased dependency on social services, and a rise in social ills such as crime are some of the key social effects associated with dropping out of school (Azzam, 2007). Individual consequences of school dropout include reduced income, lack of job opportunities, and increased exposure to health threats (Thurton et al., 2006; Kgosiemang & Motzafi-Haller, 2021). It is evident that dropping out of school affects the future social and economic prospects that early school leavers may have.

Therefore, a study such as the current one is essential for informing policy formulation as it raises awareness about school dropout in Botswana and seeks to comprehend the impact of school-based factors on secondary school dropout in the country. Although significant research (Molosiwa & Moswela, 2012; Batane, 2018; Marumo & Pansiri, 2016; Mphale, 2014; Meekers & Ahmed, 1999) has been conducted to understand the causes of students dropping out of school in Botswana, no systematic effort to investigate this phenomenon using geospatial analysis techniques has been made. Spatial analysis provides a framework for incorporating the larger regional context into school level studies of secondary school dropout (Shafer & Hori, 2006). Spatial methodologies also offer an improvement over classification schemes like urban or rural where it is commonly assumed that effects are essentially homogeneous across categories (Shafer & Hori, 2006). This article, therefore, uses a geospatial approach to advance understanding of the prevalence, and potential causes of dropout at secondary school level in the sub-districts of Botswana. The study sought to answer the following key research questions: a) What are the reasons for secondary school dropout in Botswana? and b) What is the spatial distribution of secondary school dropout in Botswana?

2.0. Materials and methods

2.1 Research theoretical framework

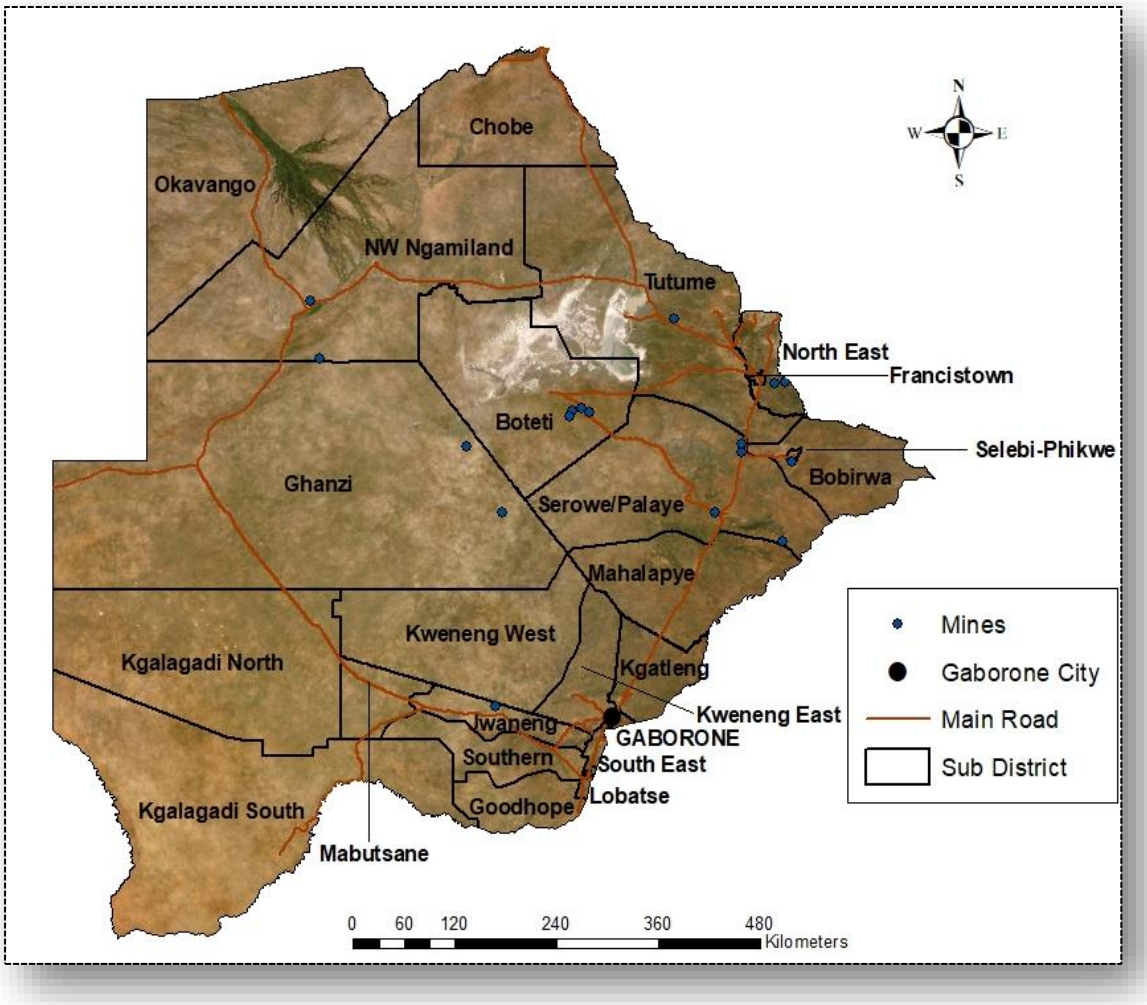
A positivist approach in human geography was used to guide the mapping and spatial analyses. In the positivist approach, the concern is to search for scientific laws which will later enable generalization. It is a scientific method that strives for accurate measurements using statistical concepts. Two main variables that are important and highly regarded in the positivist approach are location and spatial arrangement. The approach is concerned with efficiency, so the search for order is very important. In ordering, it utilizes location and distance to maximize the spatial arrangement of resources such as where to locate the schools. The use of statistics such as sampling from a large population (N) is vital and ends up with the generalization from a sample (n) back to the population. This assists with reliability because a large sample is normally required to successfully perform the generalization. The approach has its critics from other fields. Positivist approach is a reductionist method because it takes the individuals and reduces them to a number of variables such as dropouts and those with disabilities and special needs, which are then put into a statistical model. The people are unknown and silent in this

type of study because they are seen as statistically independent and dependent variables and most of the time the area of sampling is too large (Gatrell & Elliott, 2014).

2.2 Study area

The geographic unit of analysis in this study was the sub-districts (n=26) of Botswana (Figure 1). Gaborone is the national capital city as well as its own district.

Figure 1: Map showing study area: Sub-districts in Botswana



2.3 Data collection and variables

The data used in this study was secondary data from Statistics Botswana and available publicly therefore ethical clearance was not sought. The data was collected through the 2019 annual census of schools (Statistics Botswana, 2022). Annual school census is undertaken by the Education Management Information Systems (EMIS) unit in the Ministry of Education and Skills Development while data analysis and report writing are done by Education Statistics Unit at Statistics Botswana (Statistics Botswana, 2022). The data is collected on annual basis from Government, Government-aided and privately owned secondary schools at lower and

upper secondary school levels. Only data for government/public lower and upper secondary schools (n=164, 560 students) for the year 2019 was used.

The dependent variable was school dropout for the year 2019 (n=2,201). This variable was inclusive of all the genders and forms (Form 1, Form 2, Form 3, Form 4, Form 5) in secondary schools. For the independent variable, six sociodemographic variables that have theoretical and empirical associations with school dropout and risk behaviors were included (Batane, 2018; Marumo & Pansiri, 2016). These include school enrollment, special needs (students with any form of disability), student-classroom ratio, (number of students per classroom) repeaters (those who repeated a grade due to various reason and mostly because of low grades), and the total number of teachers and teacher qualification (Bachelor's degree plus a teaching diploma). To measure access to education, school enrolment was used, while quality was measured using the number of teachers and trained ones as well as student-classroom ratio. Finally, efficiency was measured using variables school dropout and number of repeaters.

2.4 Methods

Spatial distribution of school dropout was evaluated by visualizing using choropleth map. Modelling spatial heterogeneity of school dropout was done through geographically weighted regression (GWR). The underlying idea of GWR is that parameters may be estimated anywhere in the study area given a dependent variable and a set of one or more independent variables which have been measured at places whose location is known. The equation for GWR model would be:

$$y_i(u)=\beta_{0i}(u)+\beta_{1i}(u)x_{1i}+\beta_{2i}(u)x_{2i}+...+\beta_{mi}(u)x_{mi} \quad (1)$$

The notation $\beta_{0i}(u)$ indicates that the parameter describes a relationship around location u and is specific to that location. A prediction may be made for the dependent variable if measurements for the independent variables are also available at location u (Charlton et al., 2009). The measure of goodness of fit which is used extensively in GWR is the corrected Akaike Information Criterion (AIC_C) (Hurvich et al., 1998). The AIC_C can be used to compare models of the same y variable and it contains a penalty for the complexity (degrees of freedom) of the model (Charlton et al., 2009). The AIC_C provides a measure of information distance between the model which has been fitted and the unknown 'true' model (Charlton et al., 2009). Multiple regression was used to assess the association of predictor variables on school dropout following a statistical formula (Mark & Goldberg, 1988)

$$Y=\beta_0+ \beta_1X_1+\beta_2X_2+\ldots. \beta nXn+ u \quad (2)$$

where Y= secondary school dropout, X_i=a predictor, β_i=coefficient to be estimated, n = number of variables/predictors to be included in the equation, and U= error term.

2.5 Data analysis

Descriptive and inferential statistics were performed using Microsoft Excel software while the spatial analysis was conducted using ArcGIS 10.8 (ESRI, 2020). Geographically weighted regression (GWR) is a method of analyzing spatially varying relationships. This method involves fitting a model to predict the values of the dependent variable-school dropout from a set of predictor variables. The GWR tool in the Spatial Statistics Toolbox, ArcGIS 10.8 was used. An alpha significance level was set at 0.05.

3.0. Results

3.1 Descriptive statistics

Table 1 shows dropout by males and females in lower and upper secondary schools. The general trend was high school dropout was found in lower secondary (Form 3 [26.7%]) followed by Form 2 (25.2%) and Form 1 (24.1%). Overall, females dropped out with slightly high numbers (n=1,197 [54%]) compared to their male counterparts and this pattern was very evident in those attending upper secondary (Forms 4-5).

Table 1: Secondary school dropout by gender in Botswana, 2019

Gender	Form 1	Form 2	Form 3	Form 4	Form 5	Total
Male	313	285	279	67	60	1004
Female	217	269	309	190	200	1197
Total	530(24.1%)	554(25.2%)	588(26.7%)	257(11.7(%)	260(11.8%)	2201

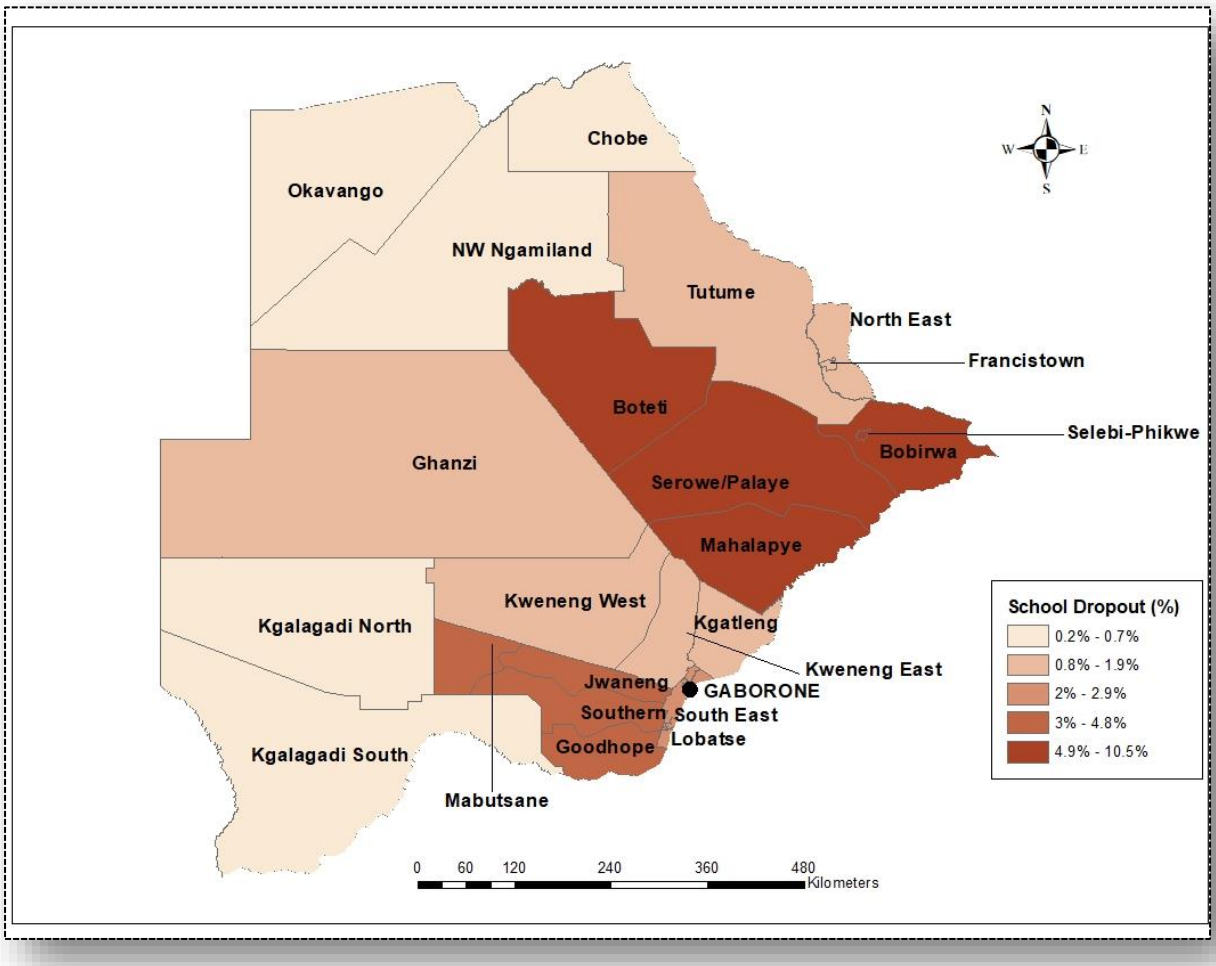
Various reasons influenced students to drop out of school. Table 2 illustrates those reasons ranging from illness to pregnancy. Truancy was the leading (45.4%) cause of dropouts followed by pregnancy (29.2%), other undisclosed reasons (12.7%) and illnesses (12.1%). Dropping out of school due to truancy was high among the lowest class of secondary school (Form 1 n=350) while pregnancy was a common reason for the Form 3 (n=184).

Table 2: Common reasons for secondary school drop out in Botswana, 2019

Reason	Form 1	Form 2	Form 3	Form 4	Form 5	Total	%
Illness	28	95	77	21	45	266	12.1
Truancy	350	268	257	86	39	1000	45.4
Pregnancy	46	169	184	119	125	643	29.2
Others	106	22	70	31	51	280	12.7
	530	**554**	**588**	**257**	**260**	**2201**	

Figure 2 is a spatial distribution of school dropouts by sub-districts in Botswana for the year 2019. The darker colors show the high percentage of school dropout (with maximum of 10.5%) and light colors indicate low (0.2-0.7 %) school dropout. By spatial distribution, secondary school dropout was high in central districts such as Serowe/Palapye and Bobirwa (4.9-10.5%) followed by some areas in southern Botswana including Goodhope and Jwaneng (range: 3-4.8%).

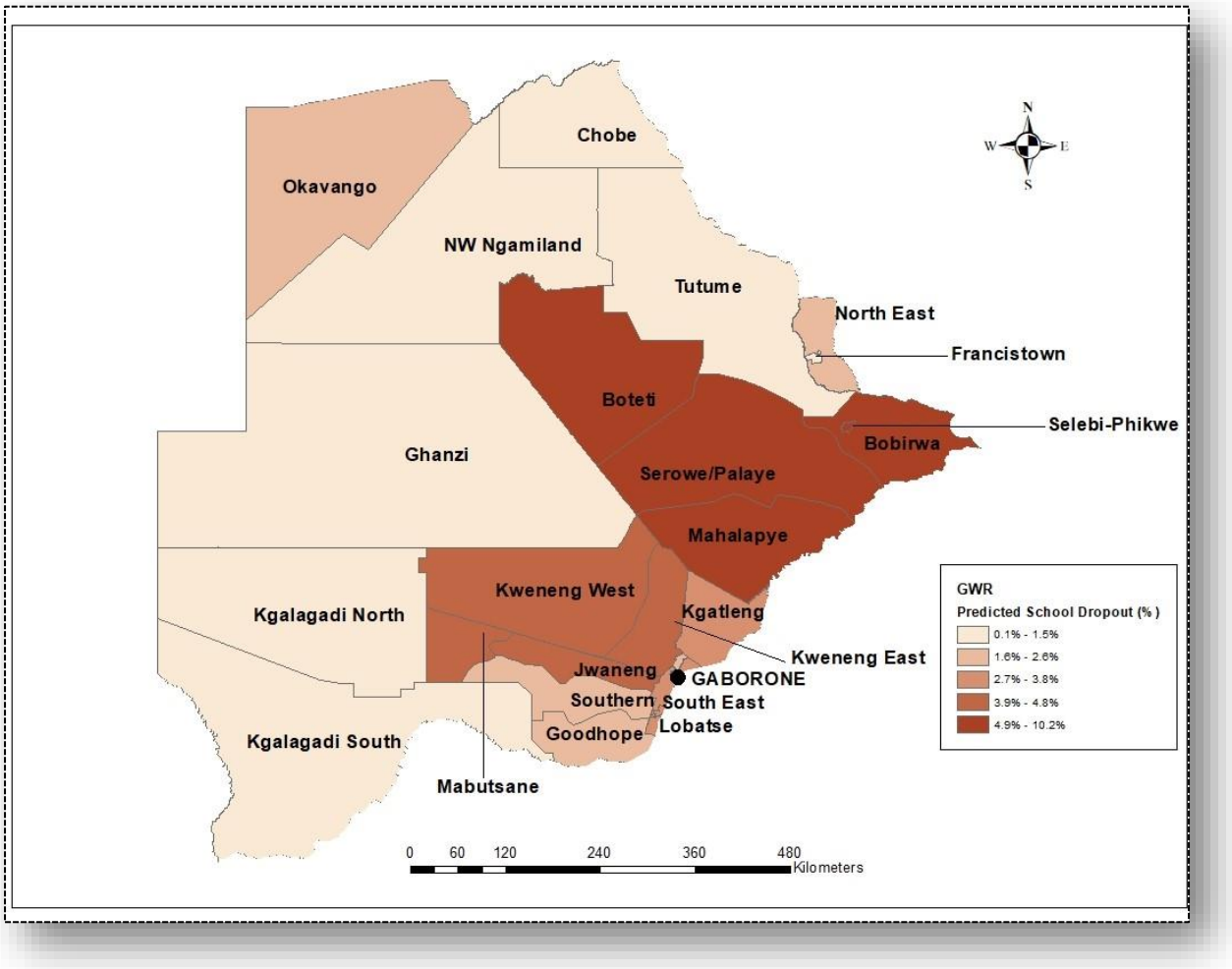
Figure 2: Spatial distribution of school dropouts by sub-districts in Botswana, 2019



3.2 Geospatial analysis

Spatial prediction of school dropout was modelled using geographically weighted regression (GWR) which predicted 82% variation (R=0.82; AICc 350.05) of school dropout using six predictors. The results are presented in Figure 3 and Table 3. The highest school dropout was found in central districts such as Boteti, Serowe/Palapye and Bobirwa (range 4.9-10.2%) followed by southern districts of Kweneng, Mabutsane and Jwaneng (range 3.9-4.8%) (Figure 3). To further unpack the spatial variation of school dropout in Botswana, Table 3 shows the influential predictors. The statistical regression model showed that about 71% of variation in school dropouts can be explained by school enrolment, student-class ratio, students with special needs, those repeating grades and the number of trained teachers (Table 3). Having special needs (β 1.23; p-value 0.008) and teacher's qualifications (β-0.162; p-value 0.007) were the most significant factors—controlling for enrolment, student-classroom ratio, and other factors (Table 3). Students with special needs such as disability increased the chance of dropping out while trained teachers reduced the likelihood of a student leaving school (Table 3).

Figure 3: Geographically weighted regression prediction of secondary school dropout, 2019



R2=0.82, AICc=350.05, Residual Squares =243096.79

Table 3: Secondary school dropout in Botswana and influencing factors, 2019

Regression statistics	
Multiple R	0.840694131
R Square	0.706766621
Adjusted R Square	0.609022162
Standard Error	149.4065701
Observations	25

Anova					
	df	***SS***	***MS***	***F***	***Significance F***
Regression	6	968444.0228	161407.3371	7.230758907	0.000478
Residual	18	401801.8172	22322.32318		
Total	24	1370245.84			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-147.8526376	201.2355761	-0.73472415	0.471971832
Enrolment	-0.004591924	0.006466879	-0.710068042	0.486760096
Student-class ratio	3.342917605	3.480529343	0.960462411	0.349547818
Special needs	**1.231708639**	0.413472793	2.978935156	**0.0080454**
Repeaters	-0.918520304	0.663869729	-1.383585159	0.183405255
Teacher qualification	**-0.1622045**	0.050841574	-3.223496727	**0.007492775**
Total teachers	0.682949221	0.226767685	1.011669064	0.230567899

4.0. Discussion

This study sought to determine the prevalence and causes of secondary school dropout in Botswana. Data analysis indicates that secondary school dropout rates among female learners in Botswana are higher as opposed to their male counterparts. As shown in Table 1, the prevalence of female dropouts tends to increase as students navigate through the secondary education system especially in lower Forms (1, 2 and 3). In contrast, Table 1 further illustrates a decline in the prevalence of male students' dropout rates as they progress from lower secondary school and transition to upper secondary school. The high prevalence of female students' dropout as opposed to male students, however, does not come as a surprise. Females, especially those coming from disadvantaged rural communities are most likely to dropout out of school (United Nations Girls Education Initiative, 2009). This trend may be linked to the attitudes of local communities on the roles and obligations of female children which originate from socially constructed traditional norms and values. For instance, household chores such as cooking, cleaning, and taking care of the sick are mostly allocated based on one's gender and many times they are given to female children to perform (Makwinja-Morara, 2009). As a result, the rate of female students' enrolment in the school tends to decline significantly when they enter lower secondary school and declines further when they reach upper secondary school. Gyan (2013) posits that despite concerted effort to promote gender equality across the world, chances of female students enrolling into primary and lower secondary school in Southern Africa are very low, although they enjoy gender equality once they are enrolled into the education system.

Furthermore, this study discovered that truancy was the main reason why secondary school students in Botswana drop out of school. These findings, however, conflict with Mphale (2014) who found that student behavior (99.8%) was the major risk factor for student dropout in secondary schools in Botswana. Nonetheless, high levels of truancy indicate that students are potentially not interested in school, and this may eventually lead to them dropping out. Some scholars regard truancy as resistance to the school environment (Zhang, 2007) which eventually results in negative development outcomes such as juvenile delinquencies, crime, and deviant acts (Henry, 2007; Huck, 2011). Given that truancy is currently Botswana's main reason for students to drop out of school, maintaining a conducive learning environment in schools across the country is important. Students' school environments and the learning experiences they derive while attending classes has an impact on how they perceive and approach learning. Therefore, there is a great likelihood that students will drop out of school if

their learning environment is unfavorable and does not meet their educational, psychological, and social needs.

Pregnancy was found to be the second major cause of secondary school dropout after truancy. Previous research indicates that teenage pregnancy is a contributory factor to most female students dropping out of school (Rosenberg et al., 2019; Molosiwa & Moswela, 2012; Stoner et al., 2019; Meekers & Ahmed, 1999; Makwinja-Morara, 2009). For example, a study conducted by Stoner et al. (2019) found that there is a positive relationship between teenage pregnancy and school dropout due to stigma associated with childhood parenting, inadequate support from one's family and being isolated from one's peers. Absenteeism from school may also be induced by pregnancy symptoms such as dizziness, vomiting, nausea, and fatigue (Panova & Berchtold, 2016). In the same vein, poor physical wellbeing of teenage mothers after giving birth and the need to provide childcare may further make them want to discontinue with school.

The third most common influencing factor of secondary school dropout in Botswana is illness. These results contrast with those of Branson et al. (2014) which consider illness not to be a significant cause of school dropout because it is time bounded depending on the treatment given and because most illnesses are curable. However, occasionally, learners are exposed to serious health issues that could necessitate long-term hospitalization. In other cases, a student might contract a highly contagious illness that would force him or her to leave school. Furthermore, access to social amenities like better healthcare facilities is not always assured in remote communities. In some instances, students may therefore be compelled to travel to adjacent towns and cities in order to access medical treatments, keeping them away from school for an extended period of time. This results in the student being left far behind in terms of completing the curriculum, which may eventually lead to them dropping out of school. As a result, the argument presented by Branson et al. (2014) may not be considered on the premise stated above.

Our findings also revealed the spatial patterns of secondary school dropout in Botswana. School dropouts were prevalent in rural and semi-urban districts of Botswana such as those in northwestern and eastern–Bobirwa, Boteti, Mahalapye, and Serowe/Palapye–and in the southern and south-eastern–Kweneng, Mabutsane and Jwaneng. These results contrast geographically with those of Polelo (2006), Mokibelo (2014) and Pansiri (2008) who indicated that secondary school dropout in Botswana tends to be prevalent in rural settlements especially those located in the western and north-western districts of the country. Compared to students enrolled in schools found within the north-eastern, northern, and southern districts of Botswana, students residing in the north-western and western regions of Botswana tend to drop out of school in large numbers before graduating from the secondary education course. This trend may be linked to the fact that majority of the economic activity in Botswana is mostly centred around the southern part of the country. Therefore, poverty tends to persist in western and north-western regions of Botswana, affecting students' ability to access adequate education services (Mokibelo, 2021). Our study results were consistent with Mokibelo (2010) who illustrated that other reasons of school dropout are not economic related. She showed that Khoe

learners in the central district lacked comprehension skills and were generally slow learners. The author further added that poor learning abilities of these students have persisted from primary school and resulted in poor performance at the secondary school level (Mokibelo, 2010).

Multiple regression results exposed the importance of having highly qualified and trained teachers within the education system. As shown in the model, the relationship between the qualifications of teachers and the prevalence of student dropout is significant, which indicates that the qualifications of teachers influence secondary school dropout rates in Botswana. What can also be learned from the model is that the higher the qualifications obtained by a teacher the lower the probability of students dropping out of school. The importance of having highly qualified teachers is reflected by the findings of a study conducted by Ekstrom et al. (1986) which concluded that having poorly trained teachers translates into poor teaching methods and low morale towards their work due to inadequate salaries. As a result of the unimproved teaching methods, students end up dropping out of school because they are bored, unmotivated, and not interested in the learning process. This is also reinforced by Mnguni (2014) who argues that in some instances, teachers with low qualifications tend to employ authoritarian teaching methods which may result in students missing lessons and eventually dropping out of school. In addition, learners especially those in rural areas require special learning support because the curriculum may cover topics that such students may have never come across nor can they relate to. Rural learners therefore require highly trained teachers who will assist them to comprehend the material being taught in class despite the cultural differences. A study by Mokibelo (2021) on remote area dweller settlements in Botswana showed that it is important to have highly trained teachers who will be vital in breaking the language barrier between parents and teachers. The author found that some parents in the study did not attend parent-teacher meetings because they did not understand the language of instruction (Mokibelo, 2021).

Moreover, the regression model indicated that there was a significant relationship between students with special learning needs and school dropout. Students with special learning needs were most likely to drop out of school. These results are consistent with the results of a study conducted by Weybright et al. (2017) in South Africa which concluded that the physical or mental problems of a student such as having psychiatric disorders may result in them dropping out of school. In Botswana, there is a considerable shortage of appropriate instructional materials (Dart, 2007) needed for teaching students with special learning needs. The inadequate provision of resources required for teaching students with special learning needs in Botswana has affected a successful implementation of inclusive education in the country, which results in students with learning disabilities eventually dropping out of school. Moreover, Zimba et al. (2007) studied various factors affecting successful implementation of inclusive education in Namibia. The authors discovered that Namibian teachers had a negative attitude towards students with learning difficulties. Stigmatization of students with special learning needs by teachers may, therefore, result in these students dropping out of school.

Additionally, the relationship between student-class ratio and school dropout was not significant. The model however indicated that an increase in the student-class ratio raised the chances of students dropping out of school. Overcrowding in classes increases the student-teacher ratio and this reduces the amount of individualized attention that a teacher may give to each student and further makes it difficult for teachers to monitor the progress of students and identify individual learning needs of each student. Munsaka (2009) opines that having many students in one class leads to a reduction of the individual attention given to students by teachers, which may result in learners being disengaged from school activities and ultimately leaving school.

Interestingly, grade repetition did not appear to be a significant factor in this study even though many studies (Bowers et al., 2012; Bowers, 2010; De Witte et al., 2013; Rumberger & Larson, 1998) have noted it as one of the prevalent causes of school dropout. In addition, the regression model showed that as enrollment decreased so did school dropout even though the relationship was not statistically significant. This is in line with the existing literature by several reseachers (Croninger & Lee, 2001; DeLuca & Rosenbaum, 2001; Lee & Bukam, 2003) who reported that students who attended schools with a low enrolment rate of less than 1 500 pupils had strong interpersonal ties with other students and teachers. In smaller classes, teachers are able to fulfill individual needs of students and offer a more academically intensive curriculum.

5.0. Conclusion

The purpose of this study was to comprehend the prevalence and reasons behind secondary school dropout in Botswana. It was discovered that gender disparities were pervasive in Botswana's educational system. Compared to male students, a somewhat higher percentage of female students dropped out of school. The primary contributing factors of secondary school dropout in Botswana have been identified as a variety of factors ranging from illness to pregnancy. However, truancy rather than pregnancy, other covert causes, or illness was the main factor causing school dropout in Botswana. The lowest secondary class (Form 1, n=350) experienced a high rate of school dropout due to truancy, whereas the Form 3 (n=184) experienced a high rate of dropout due to pregnancy. Regarding the disparities between rural and urban areas, the greatest school dropout rates were found in rural and semi- urban districts such as Boteti, Serowe/Palapye and Bobirwa followed by Kweneng, Mabutsane and Jwaneng districts. The study was guided by the positivist approach in human geography where the concern was to search for scientific laws which would later enable generalization. Thus, the study also examined school-based factors that are potential predictors of secondary school dropouts. Overall, having special learning needs and the qualifications of teachers were the most significant predictors of school dropout controlling for enrolment, student-classroom ratio, and other factors. The possibility of a student dropping out increased for those with specific requirements, such as a disability, whereas the likelihood was decreased by trained teachers. The findings of this study should enable all involved stakeholders to put in place measures that promote inclusive education for students attending schools in rural and semi-urban districts.

This study was not without limitations. Data was not available by districts for gender dropout and reasons for dropping out, therefore, spatial analysis which could have visualized the distribution was impossible. Data was also available at the district level as the lowest spatial scale, which could have masked variations happening at the school or individual level. Despite all these limitations, the study was able to assess the prevalence and causes of secondary school dropout in Botswana using statistical and geospatial methods.

References

Ajaja, P. O. (2012). School dropout pattern among senior secondary schools in Delta State, Nigeria. *International Education Studies*, *5*(2), 145-154. http://dx.doi.org/10.5539 /ies.v5n2p145

Amphiah, J. G., & Adu-Yebaoh, C. (2009). Mapping the incidence of school dropouts: A case study of communities in Northern Ghana, *Routledge*, *45*(2), 219-232. https://doi.org /10.1080/03050060902920625

Azzam, A. M. (2007). Why students drop out. *Educational leadership*, *64*(7), 91-93.

Batane, T. (2018). School-community interrelations and school dropouts: Towards developing sustainable education processes for remote areas children. *Mosenodi*: *International Journal of the Educational Studies*, *21*(2), 1-15.

Bennell, P., & Akyeampong, K. (2007). *Teacher motivation in Sub-Saharan Africa and South Asia*. (Vol. 71). London: DfID.

Bowers, A. J. (2010). Grades and graduation: A longitudinal risk perspective to identify student dropouts. *The Journal of Educational Research*, *103*(3), 191-207. https: //psycnet.apa.org/doi/10.1080/00220670903382970

Bowers, A. J., Sprott, R., & Taff, S. A. (2012). Do we know who will drop out? A review of the predictors of dropping out of high school: Precision, sensitivity, and specificity. *The High School Journal*, *96*(2), 77-100. https://doi.org/10.1353/hsj.2013.0000

Branson, N., Hofmeyr, C., & Lam, D. (2014). Progress through school and the determinants of school dropout in South Africa. *Development Southern Africa*, *31*(1), 106-126. https:// doi.org/10.1080/0376835X.2013.853610

Bridgeland, M. J., DiIulio, J. J., & Morison, B. K. (2006). *The silent epidemic perspectives on high school dropouts.* Civil Enterprises.

Brown, B., & Forcheh, N. (2014). Strategies to achieve congruence between student chronological age and grade placement in the compulsory phase of education in Botswana. *Journal of Education and Learning*, *3*(3), 76-94.

Charlton, M., Fotheringham, S., & Brunsdon, C. (2009). Geographically weighted regression. *White paper. National Centre for Geocomputation. National University of Ireland Maynooth*, *2*.

Chebanne, A. M. (2022). The prospect of languages in education in Botswana: A critical reflection. *Mosenodi: International Journal of the Educational Studies*, *25*(1), 1-13.

Chilisa, B. (2002). National policies on pregnancy in education systems in Sub-Saharan Africa: The case of Botswana. *Gender and Education*, *14*(1), 21-35. https://doi .org/10.1080/09540250120098852

Croninger, R. G., & Lee, V. E. (2001). Social capital and dropping out of high school: Benefits to at-risk students of teachers' support and guidance. *Teachers College Record*, *103*(4), 548-581. https://psycnet.apa.org/doi/10.1111/0161-4681.00127

Dart, G. (2007). Provision for learners with special educational needs in Botswana: A Situational Analysis. *International Journal of Special Education*, *22*(2), 56-66.

De Witte, K., Cabus, S., Thyssen, G., Groot, W., & Van Den Brink, H. M. (2013). A critical review of the literature on school dropout. *Educational Research Review*, *10*, 13-28. https://doi.org/10.1016/j.edurev.2013.05.002

DeLuca, S., & Rosenbaum, J. (2001). Individual agency and the life course: Do low-SES students get less long-term pay-off for their school efforts? *Sociological Focus*, *34*(4), 357-376. https://doi.org/10.1080/00380237.2001.10571208

Dichaba, M. (2013). School drop-out and success in the trades: A paradox or a reality of South African youths. *Journal of Social Science*, *35*(2), 89-96.

Ekstrom, R. B., Goertz, M. E., Pollack, J. M., & Rock, D.A. (1986). Who drops out of high school and why? Findings from a national study. *Teachers College Record*, *87*(3), 356-373.

Entwisle, D. R., Alexander, K. L., & Steffel-Olson, L. (2005). Urban teenagers: Work and dropout. *Youth Society*, *37*(1), 3-31. https://doi.org/10.1177/0044118X04268313

Entwisle, D. R., Alexander, K. L., & Steffel-Olson, L. (2004). Temporary as compared to permanent high school dropout. *Social Forces*, *82*(3), 118-1205.https://doi.org/10 .1353/sof.2004.0036

Environmental Systems Research Institute. (ESRI). (2020). ArcMap v. 10.8. Redlands California.

Eron, L., & Emong, P. (2017). Tackling education of girl child with disability in urban settings of Uganda. In W. T. Pink, & G. W. Noblit (Eds.), *Second international handbook of urban education* (pp. 51-65). Springer.

Gatrell, A. C., & Elliott, S. J. (2014). *Geographies of health: An introduction*. John Wiley & Sons.

Gondwe, C. (2016). Factors influencing rural female pupils drop out from primary schools (Unpublished master's dissertation). St Cloud State University. https://repository .stcloudstate.edu/edad_etds

Grant, M. K., & Hallman, K. K. (2008). Pregnancy- related school dropout and prior school performance in KwaZulu- Natal, South Africa. *Studies in Family Planning, 39*(4), 369-382. https://doi.org/10.1111/j.1728-4465.2008.00181.x

Gyan, C. (2013). The effects of teenage pregnancy on the educational attainment of girls at Chorkor, a suburb of Accra. *Journal of Educational and Social Research, 3*(3), 53-60. http://dx.doi.org/10.5901/jesr.2013.v4n3p53

Henry, K. L. (2007). Who's skipping school: characteristics of truants in 8th and 10th grade. *Journal of School Health, 77*(1), 29-35. https://doi.org/10.1111/j.1746-1561.2007 .00159.x

Herbert, T.P., & Reis, S. M. (1999). Culturally diverse high-achieving students in an urban high school. *Urban Education, 4*, 428-457.

Huck, J. L. (2011). Truancy programs: are the effects too easily washed away. *Education and Urban Society*, *43*(4), 499-516. https://doi.org/10.1177/0013124510380716

Hurvich, C. M., Simonoff, J. S., & Tsai, C. L. (1998). Smoothing parameter selection in nonparametric regression using an improved Akaike information criterion. *Journal of the Royal Statistical Society: Series B (Statistical Methodology), 60*(2), 271-293. https: //doi.org/10.1111/1467-9868.00125

Jotia, L. A & Pansiri, N. O. (2013). The missing link in Botswana education policy. *European Journal of Educational Studies*, *51*(1),101-110 https://pdfs.semanticscholar.org/f323 /d9e66df207a936c1559acf2a359c1cc3799d.pdf

Kgosiemang, T., & Motzafi-Haller, P. (2021). Understanding early pregnancies: Sociocultural factors of teenage childbearing in Gaborone, Botswana. *Qualitative Health Research*, *31*(14), 2641-2652.

Le Roux, W. (1999). *Torn apart: San children as change agents in a process of acculturation: A report on the educational situation of San children in Southern Africa*. Commissioned

by Kuru Development Trust and WIMSA (Working Group of Indigenous Minorities in Southern Africa). Retrieved 12 October 2022, from https: //medupe.ub.bw/articles/1217065.163/1.PDF

Lee, V. E., & Bukam, D. T. (2003). Dropping out of high school: The role of school organization and structure. *American Educational Research Journal*, *40*(3), 353-393. https://doi.org/10.3102/00028312040002353

Makwinja-Morara, V. (2009). Female dropouts in Botswana junior secondary schools. *Educational studies*, *45*(5), 440-462. https://doi.org/10.1080/00131940903190493

Mandevu, N.M. (2009). *School dropout among the remote area dwellers of Northern Botswana*. (Unpublished master's dissertation). University of Botswana.

Mark, J., & Goldberg, M. A. (1988). Multiple regression analysis and mass assessment: A review of the issues. *Appraisal Journal*, *56*(1), 89-110.

Marumo, B. B., & Pansiri, N. O. (2016). Early school withdrawals and underperformance as indicators of poor attention to leaners welfare: Botswana in 50 years of self-rule. *Journal of Educational Issues*, *2*(2), 367-384. https://doi.org/10.5296/jei.v2i2.10270

Maton, K., & Moore, R. (2009). *Social realism, knowledge, and the sociology of education: Coalitions of the mind.* A&C Black.

McWhirter, J. J., McWhirter, B. T., McWhirter, E. H., & McWhirter, A. C. (2017*). At-risk youth: A comprehensive response for counselors, teachers, psychologists, and human service professionals* (3rd ed.) Cengage Learning.

Meke, E. S. (2012). *An assessment of the implementation of continuing professional development programmes in Malawi: A case of Zomba rural education district in Malawi* (Unpublished doctoral thesis). University of Fort Hare.

Meekers, D., & Ahmed, G. (1999). Pregnancy related school dropouts in Botswana. *Population Studies*, *53*(2), 195-209. https://doi.org/10.1080/00324720308081

Mnguni, I. B. (2014). *Investigating the causes of learner dropout at secondary schools in Johannesburg South, Gauteng* (Unpublished master's dissertation). University of South Africa.

Mokibelo, E. B. (2021). Parents-teachers' relationships in remote area dweller settlement primary schools: An educational dilemma. *Mosenodi: International Journal of Educational Studies*, *24*(2), 67-87.

Mokibelo, E.B. (2014). Why we drop out of school: Voices of San school dropouts in Botswana. *The Australian Journal of Indigenous Education*, *43*(2), 185-194.

Mokibelo, E. B. (2010). English: A disempowering language for Khoe learners in Botswana. In K. C. Monaka, O. S Seda, S. E Ellece & J. McAllister (Eds.), *Mapping Africa in the English-speaking world: Issues in language and literature* (pp. 191–203). Cambridge Scholars Publishing.

Mokibelo, E. B., & Moumakwa, T. V. (2006). Social factors that contribute to the reading incompetence of Khoe learners at Motshelagatau Primary School. *PULA: Botswana Journal of African Studies*, *20*(1), 106-113.

Molefe, B., Mokobane, M., & Polelo, M. (2001). *A report on wastage in primary schools: An assessment of school dropout in remote area dweller settlements in Botswana* (Unpublished report). University of Botswana.

Molosiwa, S., & Moswela, B. (2012). Girl pupil dropout in secondary schools in Botswana: Influencing factors, prevalence, and consequences. *International Journal of Business and Social Science*, *3*(7), 265-271.

Mphale, L. M. (2014). Prevalent dropout: a challenge on the roles of school management teams to enhance students' retention in Botswana junior secondary schools. *International Journal of Business and Social Science*, *11*(1). 178-188.

Mukhopadhyay, S., Nenty, H. J., & Abosi, O. (2012). Inclusive education for learners with disabilities in Botswana primary schools. *Sage Open*, *2*, 1-9. https://doi.org/10.1177/2158244012451584

Munsaka, E. (2009). The influence of family and community on school dropout among rural adolescents in Zambia. *New Voices in Psychology*, *5*(2), 64-77.

Nyati-Ramahobo, L. (2003). *Culture in education for the San people* (Paper presentation). Conference on Khoe and San Development. Gaborone, Botswana.

Oghuvbu, E. P. (2008). The perceived home and school factors responsible for dropout in primary schools and its impact on national development. *Ekpoma Journal of Behavioural Sciences*, *1*, 234-235.

Panova, K., Berchtold, S. (2016). Factors associated with unwanted pregnancy among adolescents in Russia. *Journal of Pediatric and Adolescent Gynecology*, *29*(5), 501-505. https://doi.org/10.1016/j.jpag.2016.04.004

Pansiri, N. (2008). Improving commitment to basic education for the minorities in Botswana: A challenge for policy and practice. *International Journal of Educational Development, 28*(4), 446-458. http://hdl.handle.net/10311/521

Pinnock, D. (2016). *Gangtown*. Tafelberg.

Polelo, M .M. (2006). School drop-out among the remote area dwellers of Botswana: A socio-cultural analysis. *Pula: Botswana Journal of African Studies, 19*, 85-102.

Rosenberg, M., Pettifor, A., Miller, W. C., Thirumurthy, H., Emch, M., Afolabi, S. A., & Kah, K. (2019). Relationship between school dropout and teen pregnancy among rural South African young women. *Health, Education and Behavior, 46*(4), 559-568. https://doi.org/10.1093/ije/dyv007

Rumberger, R. W., & Larson, K. A. (1998). Student mobility and the increased risk of high school dropout. *American journal of Education, 107*(1), 1-35. https://doi.org/10.1086 /444201

Sekere, B. (2011). Secondary education for San students in Botswana: A new Xade case study. *Diaspora, Indigenous, and Minority Education*, *5*(2), 76-87. https://doi.org/ 10.1080/15595692.2011.559772

Shafer, M., & Hori, M. (2006). The spatial dynamics of high school dropout: the case of rural Louisiana. *Journal of Rural Social Sciences, 21*(1), 55-79. https://egrove.olemiss.edu/ jrss/vol21/iss1/4

Spaull, N. (2015). Schooling in South Africa: How low-quality education becomes a poverty trap. *South African Child Gauge, 12*(1), 34-41.

Statistics Botswana. (2022). *Secondary education statistics brief 2019.* Statistics Botswana.

Stoner, M. C., Rucinski, K. B., Edwards, J. K., Selin, A., Hughes, J. P., Wang, J., & Pettifor, A. (2019). The relationship between school dropout and pregnancy among adolescent girls and young women in South Africa. *Health Education and Behavior*, *46*(4), 559-568. https://doi.org/ 10.1177/1090198119831755

Tafa, E. M. (2002). Corporal Punishment: The brutal face of Botswana's authoritarian Schools. Educational Review, *54*(1), 17-26. https://doi.org/10.1080 /00131910120110848

Thurton, B., Collins, M., & Daugherty, R. (2006). Study of resiliency of American Indian high school students. *Journal of American Indian Education*, *45*(1), 4-16. https://www.jstor .org/stable/24398421

United Nations. (2020). *Policy Brief: Education during COVID-19 and beyond. https://www.un.org/development/desa/dspd/wp-content/uploads /sites/22/2020/08/sg_ policy_brief_covid-19_and_education_august_2020.pdf*

United Nations. (2001). *The aims of education-convention on the rights of the child.* https://digitallibrary.un.org/record/447223?ln=en

United Nations Educational, Scientific and Cultural Organization. (2017). *Education for sustainable development goals*. https://unesdoc .unesco.org/ark:/48223/pf0000247444

United Nations Educational, Scientific and Cultural Organization. (2000). *World Education Report*. https://unesdoc.unesco.org/ark:/48223 /pf0000119720

United Nations Girls Education Initiative. (2009). *Gender equity in education; progress and challenges.* UNICEF. https://www.unicef.org /education/girls-education

Weybright, E. H., Caldwell, L. L., Xie, H., Wegner, L., & Smith, E. A. (2017). Predicting secondary school dropout among South African adolescents: A survival analysis approach. *South African Journal of Education*, *37*(2), 1-11. https://doi.org/ 10.15700/saje. v37n2a1353

Wotherspoon, T. (2004). *The sociology of education in Canada: Critical perspectives.* Oxford University Press.

Zhang, M. (2007). School absenteeism and the implementation of truancy-related penalty notices. *Pastoral Care in Education*, *25*(4), 25-34. https://doi.org/ 10.1111/j.1468-0122.2007. 00422.x

Zimba, R. F., Mowes, A. D., & Naanda, A. N. (2007). Inclusive education in Namibia. In P. Engelbrecht, & L. Green (Eds.), *Responding to the challenges of inclusive education in Southern Africa* (pp. 39 - 51). Van Schaik.