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Location as a Factor in the Prediction of Performance in Botswana Junior School Certificate Agriculture Examinations by Continuous Assessment Scores

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The study looked at the location of schools as it relates to the academic performance of students in Botswana. The study population was the results of Junior Certificate (JC) Agriculture Examinations conducted in 2009 among 206 secondary schools in rural, peri-urban and urban areas of Botswana. One hypothesis was formulated and tested. Data were analysed using regression. When comparing three pairs (urban and peri-urban), (urban and rural) and (peri-urban and rural), the results show that the beta weights when transformed into z-values are not significantly different and are less than the critical values (1.96) given alpha level of 0.05. The results showed no significant difference between students' academic performance in rural, peri-urban and urban secondary schools in agriculture junior school certificate examinations. The study has proven that school location has no bearing on student academic performance in agriculture junior school certificate examinations in Botswana.

Keywords: School Location; Academic Performance; Junior Secondary School; Continuous Assessment; JC Agricultural Examinations

Introduction

One of the most topical debates in the education system is the prediction of success in examinations. There is no certainty if there are any predictors that accurately determine whether a student will be an academic genius, a drop out, or an average performer (Golding, 2006). The task to develop effective predictors of academic success is a critical issue for educators. Conducting examinations within and at the end of each and every school year is a part of the school curriculum in Botswana and other countries; learners take public examinations to determine their academic standing at each level of education (Ramatlala, 2012).

Ministry of Education (MOE) in collaboration with Botswana Examination Council (BEC) and Department of Curriculum and Evaluation has recommended school-based continuous assessment (CA) for practical subjects, such as agriculture. Schools assess practical activities carried out by students and grade them for assessment of learning purposes (Ramatlala, 2009). At the end of three years at junior secondary schools, all marks earned by students from practical continuous assessment are combined with theory-based assessment to determine the final grade. Thobega & Masole (2008) in their study on use of forecast grades at Botswana General Certificate of Secondary Education (BGCSE) found out that the mean mark for agriculture practical at BGCSE was skewed towards the highest possible mark whereas for theoretical papers were around the median. They further said that this scenario puts the professionalism of teachers who are entrusted with the production of coursework marks on the spotlight. Their assertion culminates into skepticism on the validity, reliability, and monitoring of the school-based examinations. McGaw (2006) also underscored the importance of reliability and validity of examinations irrespective of the type, format or even purpose of the examination during his work on assessment fit for a purpose study.

According to Mkpugbe (1998), on whether the location of a school influences performance in mathematics tests, the result showed that students from rural schools against all odds performed higher than those from urban schools. The results are in consonance with those of Simmelkjaer (1979), Friedman (1962) and Kostman (1977) who reported that urban schools shared common features of learning impediments, such as reading retardations, high absenteeism, drug abuse, students vandalism, apathy and overcrowding which have manifested in their poor performance. The results ran parallel with those of Ogunlade (1973), Lawin (1973), Obot (1991), and Ajayi (1988) in which they found that students from urban schools performed better than those from rural schools. Their reasons were that urban schools are better staffed, with better facilities, so students are

exposed to good study habits, and highly motivated to study with conducive learning environment; hence these factors encourage the students from urban schools to perform better than those from rural schools. Young (2001) concluded that rural students perform less well than urban students on standardized tests of educational achievement. Mkpugbe (1998) noted that different aspects of school environment influence students' achievement. She further stated that the individual students' academic behavior is influenced not only by the motivating forces of his home, scholastic ability, and academic values, but also by the social pressure applied by the participants in the school setting. In Botswana, most rural-based schools which lack enough qualified teachers, are poorly equipped and lack basic amenities and all these serve as inhibiting factors of good academic performance. Combining school location and other variables on science performance may or may not produce the desired result. This study therefore seeks to evaluate the effect of gender, socio-economic status and school location on performance in integrated science. This finding was earlier on elaborated by Okunrontifa (1973) who observed that most students living in rural environments of Nigeria have significantly lower entry behaviour than their urban centered counterparts. In his/her study, he exhibited significant differences in the academic performance and research involvement of students coming from urban and rural backgrounds. Students from highly urbanized background reported the best academic indicators, while students from rural and remote backgrounds reported the poorest. He opined that this could be influenced by the poor class attendance due to students travelling long distances.

However, Axtel and Bowers (1972) in their findings reported that students from the rural areas perform significantly better than their urban counterparts in verbal aptitude, English Language and total score using the National Common Entrance as a baseline. In another development, a research team at University of Aston recorded that it had received several well-founded reports that secondary schools have found pupils from small rural schools not only as well prepared academically as pupils from other schools, but they generally had a better attitude to work. Having been accustomed to working most of the time on their own, they could be given more responsibility for the organization of their work. Size could not exert significant direct effect on pupils' attitude towards science. Similar view was expressed by Gana (1997) in his study on the effect of using designed visual teaching models on the learning of mathematics at Junior Secondary level of Niger State, who found out that there was no significant difference in mathematics achievement scores of students in urban and rural locations.

From the various reviews of literature on locational influence on academic performance, it has been observed that the findings are not the same. While some maintain that urban students perform better in examinations than their rural counterparts, other studies have found that rural students (in spite of all odds) perform better. Some have submitted in their findings and concluded that no particular setup (urban or rural) can claim superiority over the other because their performances are the same. Alokan (2010) found out that students' problems are strongly associated with poor performance and that sex and location do not affect the negative relationship between student problems and academic performance. In another development, Considine and Zappala (2002) studied students in Australia and found out that geographical location does not significantly predict outcomes in school performance. Shield and Dockrell (2008) while looking at the effects of classroom and environmental noise on children's academic performance, found out that both chronic and acute exposure to environmental and classroom noise have a detrimental effect upon children's learning and performance.

Statement of the Problem

Morgan (1989) used the *term predictive validity* to refer to the extent to which achievement tests can be appropriately used to draw inferences regarding students' future performance. There are numerous purposes of assessing students in agriculture education, both in theory and in practical. Continuous assessment can be motivational in that it motivates students to study and practice hard. Students tend to study and practice hard when they are told well in advance that they will be assessed in the near future. Results of assessment do not only help students on how much to prepare themselves, but also provide useful feedback information on pupils' strength and weakness in different practical activities and also in different areas of the subject. This information is useful to teachers, parents and students themselves.Most students record high CA scores, but then perform badly in JC examinations. Given that CA assesses practical skills that are generated from the same specific objectives as theory it would be expected that it should enhance learning and as such be reflected with good overall examination performance.In view of these inconclusive findings, it is necessary to carry out further research to confirm or annul the otherwise protracted issue on the effect of location (urban, peri-urban and rural) as a factor in the prediction of performance in Botswana Junior School Certificate Agriculture examinations using continuous assessment scores.

Purpose and Objectives

The purpose of the study was to determine whether agriculture CA scores predict academic performance in JSCE and equally so for urban, peri-urban and rural schools. Some earlier studies (Thobega & Masole, 2008; Masole & Utlwang, 2005) have revealed coursework and forecast grades to be good predictors of BGCSE grades and in agriculture grades, but none have been found trying to determine location-based predictive validity. Hence this study aims at investigating the predictive strength of these two variables on JC agricultural examinations.

Botswana being a developing country has schools spread in rural and urban locations hence the study specifically aims at determining the extent to which school location influences the prediction of students' performance in JC agricultural examination by CA.

Hence more specifically the objective of this study is to:

- Determine the extent to which school location has influence on the ability of CA scores to predict performance in JC agricultural examinations.

Research Hypothesis

In the null form it states that:

- Location of school does not significantly influence the ability of CA scores to predict performance in JC agricultural examinations

Methodology

The study population comprised all presented candidates for

the 206 junior secondary schools which are spread across the country for the year 2009 Junior Secondary Certificate (JC) examinations in Botswana. The total population under study was 38101 students and using Comrey and Lee (1992) sample size determination method a sample of 1506 comprising of 614 rural students, 340 urban and 552 peri-urban were randomly selected.

Measures

Secondary data were used for the study, and were retrieved with permission from Botswana Examination Council (BEC) academic records. To ensure validity of the scores used in the grading, BEC carries out intensive panel-based content analysis and face validation; the scores were therefore deemed valid.

Procedure

Data were coded and entered into the computer and analysis was done by carrying out regression analyses. All the analyses were done using SPSS version 16 for Windows. The prediction model for CA scores was determined by fitting the values of the relevant parameters in the linear regression model. The predictor variable in the regression analysis was the students' CA and JC examination as the criterion variable. The significance level for testing the hypotheses set at .05 for all statistical tests.

Data Analysis and Interpretation of Results

In testing the hypothesis, data on scores obtained by students (from Urban, peri-urban and rural) for CA and JCE collected from Botswana Examination Council were used in a regression and the results were as presented in **Table 1**. The Z_β values of the analysis for urban, peri-urban and rural were 0.830, 0.829 and 0.820 respectively. When comparing the three pairs, the results show that the pairs of beta weights for (urban and peri-urban), (urban and rural) and (peri-urban and rural) when transformed into z-values are not significant. The Z_β values for rural, peri-urban and urban are 1 standard deviation above the mean score and are less than the critical values (1.96) given alpha level of 0.05. Hence it was concluded that location of school has no significant influence on the ability of CA scores to predict performance in agriculture education JC examinations and the null hypothesis was retained.

Discussion of Findings and Conclusions

Table 1 showed that school location has no significant influence on the ability of CA scores to predict academic performance of students in agriculture junior school certificate examinations in Botswana.

The above results support earlier findings by Gana (1997), Considine and Zappal (2002), and Alokan (2010), among others that academic performance of students in rural community does not differ from those in urban locations. In his own contribution on rural/urban differences, Gana (1997) in his study on the effect of using designed visual teaching models on the learning of mathematics at Junior Secondary level of Niger State, Nigeria, found out that there was no significant difference in mathematics achievement scores of students in urban and rural locations.

The findings of current study could be explained by the fact that in Botswana, majority of students in urban schools are originally from rural areas, but happen to be in town because their parents are working in urban centres. This means that they are able to carry their agricultural experience from rural areas where farming is mostly practiced in their daily teachings hence the balance in performance.

Table 1.
Location influence on the ability of CA scores to predict JCE performance in agriculture education.

Location of School	β-weight	Z_β	z-value
Urban	0.681	0.830	0.014
Per-urban	0.680	0.830	0.001
Rural	0.673	0.820	0.001

Recommendations

It is recommended that the government of Botswana should maintain the status quo between the rural and urban locations by providing the rural dwellers the social amenities which will enhance academic performance and reduce transfers of students from rural to urban schools as this could result in class congestions as well as lack of land for agricultural projects in town schools.

There is also a need to conduct studies using continuous assessment and other variables in predicting JC examination grades in different subjects.

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