IJEMS

Factors Affecting High School to University Government Sponsored Program Transition among Students in Migori County

[1]Troon John Benedict, [2]Omondi J. Ouno
[1,2]Department of Mathematics and Physical Sciences
[1,2]Maasai Mara UniversityP.O.Box 861, Narok, Kenya
[1]troonbenedict@gmail.com, [2]ouno@mmarau.ac.ke

Abstract

It is always the wish of every parent and any high school going student that at the end of the four years in high school that he/she would get to perform well. The best of the best student in Kenya are measured by their ability to perform well in K.C.S.E and be able to attain the GSSP cut off point/mark, therefore a student who attain this mark is considered to have performed best. The study checked at the factors which affect the student ability to attain this mark among students of Migori county using a binary logistic regression model and a sample of 200 students from 20 schools drawn all over the County using Stratified random sampling Method. The study found out that student performance in the county and the attainment of the GSSP cut-off mark/point is affected by Family background, Average performance in High school, the number of exams done by the student in form 4, the K.C.P.E performance of the student and the number of times the student sat for the K.C.S.E exams.

Keywords: Binary logistic regression, Stratified random sampling, KUCCPS, GSSP.

Introduction

According to the Former South Africa president Nelson Mandela as I may quote "education is the most powerful weapon which you can use to change the world". In order to achieve anything in a country it is inevitable to make sure that the citizens are literate so as to have the enough manpower and skills to be able to build a prosperous country [6]. The Kenyan government since independence have to undertake several measures to ensure that its citizens are educated enough. This measures include the free primary education established in the year 2002 by President MwaiKibaki, the free day secondary program and the government sponsored university program. Despite the government effort to sponsor every child at the university, this is rather impossible because of the cost involved therefore the government through KUCCPS have set lit of performance that a student has to attain in order to join the program (according to KUCCPS regulation, 2012). The cut-off has constantly shifted as a result of the student's performance over the years, however, despite the shift and the performance of student over the years, not more than 15% of students have ever joined this program among those who undertake K.C.S.E exams each year which brings about the worrying reason of why is this so. taking the year 2014 K.C.S.E as a year of consideration, of the 483,630 candidates who sat for K.C.S.E in the year 2014, only 67,790 students translating to 14.02% of the total candidature managed to attain the cut-off mark into the university through KUCCPS, showing that a whole bunch of 85.98% of the total 2014 K.C.S.E candidature didn't manage to attain this precious mark. Assuming equality in the distribution of this mark in all the 47 counties in the country this results into a total of 1,442

students per county making it to the university through this system [2]. This thereby brings a question of why? Why is it that not every student who get to sit for K.C.S.E get to attain this university cut-off point? And why is it that even after the lowering of this mark, not all student or even 50% get to attain it?

The answer to this question was that there existed certain variable factors that are hindered the achievement of this mark. And if this factors did exist, then they didn't only exist in the student themselves but their environment too, therefore there was an in-depth need to identify this factors and also to check on how they directly affect the attainment of this mark and how their effect could be overcome, which is the objective of the study which was to determine the factors hindering the attainment of the KUCCPS and the successful transition of students into the university government sponsored program.

Given that the attainment of the mark is depend on the performance of the student, then there is need to check on the factors that affected the performance of the form four students and the successful transition of students into the program. Past studies have shown that student's performance is influenced by factors based on the family background, student based factors and the school based factors. The school based factors which influence the student performance are the physical, human and financial school based factors, these factors depend on the age of the school, level of the school, type of school and the composition of the school [8]. The student based factors which influence the performance is the ability of the student to understand a concept in class and be able to internalize the same and in the end deliver it during exams, this ability from the past research is influenced by the age, number of times the student get to meet the concept, the gender of the student, grade repetition and sexual relationship [1], [4], [5], [7],[9]. The family background of the student is divided into numerous forms of capital which in the end get to constitute the entire family background as a concept, these categories are, financial, capital, human capital and social capital all these make up what is known as human background, all these factors combined together cover up what is known as family background which is known to be directly proportional to the student's ability to perform well in his/her exam [3].

The study intended to check if these factors do truly affect the student performance and the successful attainment of the university cut-off mark. The study assumed that the performance of the students and the attainment of the KUCCPS cut-off mark in the county was being affected by; age of the student, gender of the student, Number of times the student sit for K.C.S.E exams, Number of exams a student get to seat for before doing K.C.S.E, Family background of the student, Age of the school when the student sat for K.C.S.E in that school, Student past performance in high school since form 1 on average, Level of school, Type of school in terms of public or private, School composition, whether single or mixed and K.C.P.E mean of the student.

Methods

In order to achieve the objective, data was collected from 20 schools from four sections of Migori County. The county was divided into four initial districts of Migori which were Rongo region, Migori region, Kuria region and Nyatike region. Each region was allocated 5 schools assuming equal proportion to size. After the allocation of the schools in the regions which were used as strata, 5 schools were randomly selected from each region, in each school the class teacher of the form four class in the year 2015 was selected and interviewed for the study. The class teacher was required to

give details about 10 students from his class, according to the directives and the requirements given in the questionnaire.

The data collected for the 200 students was coded, entered into Minitab 17 software and a binary logistic regression model below fitted for it.

$$\left[\frac{P\,(Y\,=\,1)}{1\,-\,P\,(Y\,=\,1)} \right] \,=\, e^{\,XB\,+\,\varepsilon}$$

(1)

Where

$$XB \,=\, \beta_0 \,+\, \beta_1\,Age \,+\, \beta_2\,Gender \,+\, \beta_3\,FB \,+\, \beta_4\,PPH \,+\, \beta_5\,KCPE \,+\, \beta_6\,NA \,+\, \beta_7\,NE \,+\, \beta_8\,SA \,+\, \beta_9\,SC \,+\, \beta_{10}\,ST \,+\, \beta_{11}\,SL$$

Y- is the ability of the student attaining the cut-off mark

P(Y=1) – Is the probability that a student attain the cut-off mark

β_i – are the regression parameters where 1=0, 1, 2…11

Age – age of the student

Gender – gender of the student

NA – Number of times the student sit for K.C.S.E exams

NE – Number of exams a student get to seat for before doing K.C.S.E

FB – Family background of the student

SA – Age of the school when the student sat for K.C.S.E in that school

PPH – Student past performance in high school since form 1 on average

SL – Level of school

ST – Type of school in terms of public or private

SC – School composition, whether single or mixed

KCPE – K.C.P.E mean of the student.

Model test

In order to access the significance of the model and the variable effects, the following tests were carried on the fitted model;

Chi-square goodness of fit

In the Chi-square test for goodness of fit, we test the standardized residuals using the Chi-square test. In the binary logistic regression all the observed outcomes/dependent variables are either 0 or 1, therefore we denote these outcomes as yi. The expected values of y or the predicted values is given by;

$$\hat{Y}_i \,=\, \frac{e^{\,XB}}{1\,+\,e^{\,XB}}$$

(2)

26

The regression residual is given by the equation

$$r_i = \frac{Y_i - \hat{Y}_i}{\sqrt{\hat{Y}_i(1 - \hat{Y}_i)}}$$

(3)

The residual squared follows a Chi-square distribution with n-1 degrees of freedom. The residual squared is therefore tested against a Chi-square distribution with (n – 1) degrees of freedom. If the Chis-square test is not significant then the model is said to follow a binary logistic regression model and therefore adequate.

$$r^2 = \sum_{i=1}^{n} r_i^2$$

(4)

$$r^2 \rightarrow \chi^2_{(n-p)}$$

(5)

Adequacy of the individual parameters

The hypothesis for the test of the slope/coefficients of each independent variable (factors) is stated as

H_0: The slope is zero, Against

H_1: The slope is not equivalent to zero

The test statistic for the adequacy of an individual parameter is the normal distribution test or the Z-test which is calculated using the formula

$$Z = \frac{\hat{\beta}_i}{S.E(\hat{\beta}_i)}$$

(6)

The standard error for the Z-test is obtained by using the square root of the main diagonal of the variance covariance matrix.

Results

The complete fitted model before filtration of the unwanted components and parameters in the model was:

P (Pass) = exp(Y')/ (1 + exp(Y'))

Y' = -12.92 + 0.01573 KCPE + 0.226 NE - 0.0379 SA - 1.781 NA2 - 0.002 Age - 0.10 SC + 1.74 ST + 0.827 SL - 1.549 FB + 0.204 Gender + 3.351 PPH

The goodness of fit test illustrated that the model fitted well (Chi-square=172.32, DF=188, P-value=0.787).

However despite the above model passing all the above test of goodness of fit, majority of the parameter failed the test for adequacy of individual, for this reason the model failed its fitness hence required filtering to remove the unwanted parameters from the model.

Filtered Model: After the unwanted model constituents were eliminated through Backward Elimination Filtering procedure the following model was able to be fitted:

P (Pass) = exp(Y')/ (1 + exp(Y'))

Y' = -13.94 + 0.02209 KCPE + 0.1863 NE - 1.719 NA2 - 1.173 FB + 3.218 PPH

The goodness of fit test illustrated that the model fitted well (Chi-square=139.44, DF=194, P-value=0.999).

Test for adequacy of individual parameter

Table 1: Parameter Adequacy table

Variable	Coefficient	SE Coefficient	95% CI	Z-Value	P-Value
Constant	-13.94	2.72	(-19.27, -8.60)	-5.12	<0.001
KCPE	0.02209	0.00838	(0.00566, 0.03852)	2.63	0.008
NE	0.1863	0.0755	(0.0382, 0.3343)	2.47	0.014
NA2	-1.719	0.665	(-3.021, -0.416)	-2.59	0.010
FB	-1.173	0.451	(-2.058, -0.288)	-2.60	0.009
PPH	3.218	0.630	(1.983, 4.452)	5.11	<0.001

Based on the hypothesis for the test of adequacy of the individual parameter, Table 1 shows that the Z-test for the individual shows that the null hypothesis for the parameters to be rejected hence making all the model parameters adequate at 95% level of confidence.

Since the filtered model fitted good based on the goodness of fit test carried out and all the individual parameters in the model are adequate therefor the model is sufficient enough to be used in analyzing the factor effect in the study.

Discussions

From the filtered model, the only factors that affect the performance of high school students within Migori County (from attaining the university cut-off mark) area were; The K.C.P.E score of the student in class 8, family background of the student, average performance of the student in High school, number of full exams the student undertake in form 4 before K.C.S.E and number of times the student get to undertake the K.C.S.E exams

K.C.P.E Score

Based on the model an increase in the K.C.P.E mean grade of the student resulted into am increase in the probability of attaining the KUCCPS cut – off. K.C.P.E performance shows the level of the student academic foundation, thus, a higher K.C.P.E score shows a good academic foundation for the student making his/her transitional academic adaption in secondary school easy and therefore increasing his/her chances of performing well in K.C.S.E exams.

Analyzing the odds of a student passing K.C.S.E exams (and attain the university direct entry cut-off mark) with respect to his/her K.C.P.E score. It is observed that, a student who score one more mark in K.C.P.E than the other student is 1.0223 more likely to perform well in K.C.S.E than the other student who score one mark less than him/her in K.C.P.E. The 95% confidence interval for the odds is (1.0057, 1.0393). Therefore a better performance in K.C.P.E will likely yield a better performance in K.C.S.E.

Family Background

The family background variable was categorized and rated as (Poor=0, Average wealth=1 and Rich=2). Based on the model the increase in the family wealth of the student results into a decrease in the academic performance. This is because poor student have no other means of changing their state in the area and therefore only opt for education as the only means of eradicating poverty, for this reason these students are more focused on education and get to perform better than their counterparts.

In terms of odds of passing K.C.S.E, a student who is Rich is 0.3094 less likely to pass K.C.S.E and attain the direct entry university cut-off mark as compared to a student from an average family background, a student from an average family background is similarly less likely to attain the university cut-off mark as compared to a student from a poor family background, the odds have a 95% confidence interval of (0.1277, 0.7496).

Average High School Performance

The average high school general performance of the student shortened as (PPH), is the rating of the high school performance of the student and was coded as ((E and below) – 0, (≥D- but <C-) – 1,(≥C- but < B-) – 2,(≥B-but<A-) – 3,(≥A-) – 4). The model shows that a higher general performance of the student results into an increase in chances of performing well in K.C.S.E. Those student who have an average high school performance of below the (≥C- but < B-) – 2, performance rating, have an almost sure rating of not performing well in K.C.S.E and attaining the university cut-off marks (have an almost zero chance of attaining the cut-off mark with holding other variable constant). The chances of performing exceptionally increases between (≥C- but < B-) – 2 and (≥A-) – 4) performance rating, with those students have an average rating of (≥A-) – 4), having an almost sure chance of performing well and attaining the cut-off mark (have an almost 100% chance) with holding other variables constant.

Based on the odds, a student with a higher rating of high school performance based on the grouping used in the study, than the other student with a lower rating group than him/her, is 24.9678 more likely to perform well and attain the university cut-off mark than the other student with a lower performance rating than him/her. The 95% odds confidence interval for the performance based on the groups is given as (7.2638, 85.8222).

Number **of Full Exams**

The number of complete exams done by the student in form four before he/she sits for his/her K.C.S.E exams is directly proportional to his/her chances of performing well in the K.C.S.E exams. Thus, the more exams a student gets to do the more acquiesced he/she will be with what is expected in the K.C.S.E exams hence he/she will be objective on what to read thereby be able to perform well in the K.C.S.E exams.

Holding other factors constant, a student who has done one exam more than the other is 1.2047 times more likely to perform well in the K.C.S.E exams more than the other. This odds is believed to vary in the interval of (1.0390, 1.3969) at 95% confidence level.

Number of K.C.S.E Attempts

The variable (NA2) which referred to number of K.C.S.E attempt or in other words grade repetition in high school, and was coded (Non repeater =1 and Repeater=2), revealed that. A student's

performance in K.C.S.E reduced with the increase in number of times the student get to repeat a grade in high school. A student who repeat a grade has a 20% chance of performing well in K.C.S.E as compared to a Non repeater who has a 50% chance of passing the similar exam holding all other factors constant. This may be as a result of the student taking long to cope with the new environment, friends and even the class environment. This may also be as a result of destruction due to the admiration of the achievements of the former classmate who have gone to another new level leaving him/her behind (Thomson and Cunnigham 2000).

Based on the odds a student who has repeated a grade (Form 4) is 0.1793less likely to perform well in K.C.S.E than that student who has not repeated a grade. The odds is believed to fall within a range of (0.0487, 0.6595) at 95% confidence level.

The study however found out that the other factors previous assumed to be affecting the performance of the students; Age of the student, Gender of the student, School composition, School Age, School level and School type

Conclusion

From the study, the following general conclusions regarding the High school studnts of Migori county can be made regarding their transition into the university through the GSSP; The age and gender of the student when he/she sits for K.C.S.E exams does not affect his/her performance and the eventual transition to the university through GSSP. Student from poor family backgrounds in the county are more motivated towards education more than their counterparts from fortunate backgrounds. The school environment contribute very little in the student perforrmance as compared to the student based factors and family background. The number of exams done by the student increases the student retainment of contents taught in class and the eventual performance of the student. Good educational foundation build in the student at primary level of education has an important final impact on the final performance of the student at high school. Even if a student average in K.C.P.E, if he/she perform exceptionally good in form 1 to 4 he/she has an higher chance of excelling in K.C.S.E and eventually joining the university through GSSP. A student with a good high school average performance has a higher chance of performing exceptionally well in K.C.S.E. The grade repetiotion in High school has a negative impact to the student performance in K.C.S.E. School based factors such as School age, school level, school composition, school level and school type has no effect on the student performance as long as the school stakeholders are able to use the available resources to their optimal potential.

References

1.   Ikeda, Miyako and Emma García (2014), "Grade repetition: Acomparative study of academic and non-academic consequences", OECD Journal: Economic Studies, Vol. 2013/1.
2.   Kaimenyi J.T. (2015); press statement on release of 2014 K.C.S.E examination results; Ministry of Education Science and Technology; Nairobi – Kenya
3.   Kamau L.M (2013); Relationship between family background and academic performance in K.C.S.E; University of Nairobi (2013); Nairobi
4.   Kinyua S.G (2014); Determinants of student performance in K.C.S.E Using Ordinal Logistic Regression in Kiambu County; Nairobi University (2014); Nairobi - Kenya

5.   Lucy S.A.J, Simatwa E.M.W (2014);Impact of cultural factors on Girl students' Academic achievement in secondary schools in Kenya, A study of Kisumu East District; International Research Journals; Available online@ http://www.interesjournals.org/ER.

6.   Ministry of Education Science and Technology (2015);"Education for All 2015 National Review Report: Kenya

7.   Mlyakado B.P. And Timothy N. (2014), "Effects of students' Sexual Relationship on Academic Performance among Secondary School Students in Tanzania", Academic Research International Vol 5(4) 2014

8.   Onyara B.N. (2013); School Based Factors influencing student's performance at K.C.S.E in Teso South District; University of Nairobi (2013); Nairobi - Kenya.

9.   Thompson, C., & Cunningham, E. (2000). Retention and social promotion: Research and implications for policy. New York: ERIC Clearinghouse on Urban Education, Teachers College, Columbia University.