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Comparative Analysis of Academic Performance between PSSP and GSSP Students in Kenyan Universities: Case of Rongo University

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ABSTRACT

The study compared and evaluated the academic performance of the students registered under the privately sponsored students program (PSSP) versus those under the government sponsored students program (GSSP) in Kenyan Universities. More specifically, the study focused on the two aforementioned cohorts of students from Rongo University longitudinally for a period of three years. In particular, GSSP and PSSP students from School of Education of Rongo University were sampled for this study. A total sample of 136 students were selected for the study. Secondary data was used in the study with the previous academic years student results taken as the replications of the study. The academic years 2013/2014 and 2014/2015 exam results were taken as replication in order to check consistency or variations of students academic performance. Data analysis was done using Statistical Packages for Social Sciences version 23.0 and results presented using inferential and descriptive statistics. Multiple Hypotheses were formulated to test the main effects and interaction effects between factors. F-tests were used as a basis of rejecting or accepting null hypothesis at 5% level of significance. The study findings indicated that there is significant difference in PSSP and GSSP student performance on second class(both upper and lower divisions), pass and supplementary. However, the findings further revealed there is no significant difference in academic performance of PSSP and GSSP students in scoring 1st class honours. The findings of this study are expected to help the Kenyan universities and the PSSP Directorate make informative decisions while admitting students who did not qualify for Government Sponsored Students Programmes at our local universities.

Keywords: Government Sponsored Students Programmes, Privately l Sponsored Students Programmes

INTRODUCTION

The importance of education in the society cannot be gainsaid. Education holds the key to economic empowerment of the people and national development of any nation. It improves the people's ability to take advantage of the opportunities that can improve their wellbeing as individuals and be able to participate more effectively in the community and markets.

Massification of higher education has been on the rise in the recent past such that university education has been experiencing an increase in student admissions throughout the world in the last decade. The expansion is occurring at a period when higher education is experiencing unprecedented change. The increased participation levels have forced governments to restructure their education systems; increase the number of student placements as well as funding-but only at the margins of resources (Ashworth and Harvey, 1994).

The Kenyan public universities vice chancellors established the Joint Admission Board (JAB) in the 1980s to oversee the admission of government sponsored students into the universities. This board determined the cut off points of students to be admitted to the public universities but students who attained a minimum grade of C+ were locked out due to limited facilities such as bed spaces, laboratories, lecture rooms and other essential facilities. Recognizing education as a basic human right and aware of its mission to impart knowledge, skills, and to generate knowledge, various university senates saw the need to open the opportunities for those students who qualified but could not get admitted to the universities due to the set cut off points. It is on this premise that the PSSP was born in Kenyan universities. In Moi University, the PSSP program was launched in 1998. Rongo University, then a constituent college of Moi University, adopted this program upon its establishment in the year 2011 through a legal notice number 70 – Kenya Gazette Supplement number 51. The program aimed at providing opportunity for secondary school graduates who obtained a minimum grade of C+ at KCSE but were not admitted by JAB, now Kenya Universities and Colleges Central Placement Service (KUCCPS) because of the limited capacities in the public universities.

PROBLEM STATEMENT

It has always been believed that the GSSP students perform better than their PSSP counterparts owing to the fact they did well in their former high schools However, no endeavors have been made to show whether such supposition is statistically significant or not.

OBJECTIVE OF THE STUDY

The specific objectives of this study was to establish whether GSSP students outperform GSSP students academically at Rongo University's school of education.

MATERIALS AND METHODS

Factorial experiment design was employed in this study. This design was chosen because it has multi-faceted advantages. Firstly, it has great flexibility for exploring or enhancing the "signal" (treatment) in the study. Whenever we are interested in examining treatment variations, factorial design is a strong candidate as the design of choice. Secondly, factorial design is efficient. Instead of conducting a series of independent studies we are effectively able to combine these studies into one. Finally, factorial design is the only effective way to examine interaction effects. A factorial design allows the effect of several factors and even interactions between them to be determined with the same number of trials as necessary to determine any one of the effects by itself with the same degree of accuracy. Two levels of student type and five levels of the treatments were investigated in a 2x5 factorial design experiment. Each of the treatment combinations are replicated three times. The secondary data collected were tabulated using the format shown in Table 1 below:

Table 1: 2X5 factorial design table

	Treatment(Student performance)/Class Cluster				
Student Type	**Level1**	**Level2**	**Level3**	**Level4**	**Level5**
GSSP	r_1,r_2	r_1,r_2	r_1,r_2	r_1,r_2	r_1,r_2
PSSP	r_1,r_2	r_1,r_2	r_1,r_2	r_1,r_2	r_1,r_2

Where r_1 and r_2 are replication one of students academic performance for the years 2013/2014, 2012/2013 and 2011/2012 results taken in order to check consistency or variations of students academic performance and level 1 to 5 are pass of 1st class, second class(upper division), second class(lower division) , pass and supplementary(Sup.) respectively.

The mathematical model for the analysis of factorial experiments was formulated as shown below. The factorial experiment has the effect of two factors, A and B, on the response being investigated.

Let there be $\mathbf{n_a}$ levels of factor A and $\mathbf{n_b}$ levels of factor B. The mathematical model for this experiment can be stated as:

$$y_{ijk}=\mu_i+a_i+b_j+a_ib_j+\varepsilon_{ijk}$$

Where

- $\mathbf{a_i}$ is the i^{th} of the effect level of factor **A** ($i=1,2,\ldots,n_a$)
- $\mathbf{b_j}$ is the j^{th} of the effect level of factor **B** (($j=1,2,\ldots,n_b$)
- $\boldsymbol{\mu_i}$ is the general constant(Overall effect)
- $\mathbf{a_ib_j}$ is the interaction effect between **A** and **B**
- $\boldsymbol{\varepsilon_{ijk}}\sim N(0,\delta^2)$ i.e represents the random error terms(which are assumed to be normally distributed with a mean of zero and variance of $\boldsymbol{\delta^2}$.
- The subscript **k** =1,2,….,m, where m= number of replications

TEST OF HYPOTHESES

In the Table 1 above, the factor treatment is represented as factor A and the factor performance is represented as factor B. The experimenter investigated if the five levels the treatment(Class Cluster) and Student type (GSSP and PSSP) or the interactions effects between the two variables. In other words, the following hypotheses need to were tested.

1. H_0: A= 0 (No main effect of factor A, treatment)

H_1: A ≠ 0 (There is some difference in main effect A)

2. H_0: B= 0 (No main effect of factor B, Performance level)

H_1: B≠ 0 (There is some difference in main effect B)

3. H_0: AB=0 (There is no significance in interaction effect AB)

H_1: AB≠ 0 (There is some significance in interaction effect AB)

STUDY POPULATION

The population of the study was drawn from selected school of education, Rongo University because the faculty has fairly approximately equal intake number of PSSP and GSSP student population.

SAMPLE SIZE

To obtain the subjects for the sample, a stratified sampling method was used. The subjects were grouped into two equal strata according to mode of admission(GSSP and PSSP students). Thus to achieve the proportional allocation, the School was taken as a stratum.

Proportional allocation was achieved by using the formula shown below:

$$n_i = \frac{N_i}{N} n$$

Where N_i =stratum(l ɔn Arts students) population size

n= Total sample size

N= Total strata(school of Education) population size.

Exam results of sixty eight students(68) from 2014/2015 academic year and the same sixty eight student's (68) results sampled from 2013/2014 academic year were sampled for the study. Hence a total of one hundred and thirty six (136) students were selected as the sample size of the study.

DATA COLLECTION PROCEDURE

The researcher used secondary data from the two strata (PSSP and GSSP students taking Bachelor of Education Arts). The Exam results of the same subset of students for the last two years (2014/2015 and 2013/2014 academic years) were used as replicates in the study.

RESULTS AND DISCUSSION

In this section the factorial analysis of variance (ANOVA) was employed. The factorial analysis of variance (ANOVA) is an inferential statistical test which allows the researcher to test if each of the independent variables have an effect on the dependent variable (hereby called the *main effects*). It also allows the researcher to determine if the main effects are independent of each other (that is, to determine if two or more independent variables interact with each other).

The data collected for the groups of students were tabulated in 2x5 Asymmetrical factorial experiment design(2^5=32 treatments. Decisions were made based on two scenarios in that we stop if H_0 is accepted or carry Turkey's HSD Post Hoc analysis if H_0 is rejected.

The multiple hypotheses were summarily as tabulated below:

Table 1: Summary of Multiple hypotheses

Main Effect of student	Main Effect of	Interaction Effect of Type of performance and

discipline(A)	**performance(B)**	**student discipline (A and B)**
H_0: $\mu_{GSSP} = \mu_{PSSP}$ Vs H_1: $\mu_{GSSP} \neq \mu_{PSSP}$	H_0: $\mu_{Pass} = \mu_{Fail}$ Vs H_1: $\mu_{Pass} \neq \mu_{Fail}$	H_0: $\mu_{GSSP,Pass} - \mu_{GSSP,Fail} = \mu_{PSSP,\ Pass} - \mu_{PSSP,\ Fail}$ Vs H_1: $\mu_{GSSP,Pass} - \mu_{GSSP,Fail} \neq \mu_{PSSP,\ Pass} - \mu_{PSSP,\ Fail}$

Table 2: Between-Subjects factors levels

Between-Subjects Factors			
		Value Label	N
Student admission type	1	PSSP	15
	2	GSSP	15
Class Cluster	1	1st Class	6
	2	Second Class (upper division)	6
	3	Second Class(Lower division)	6
	4	Pass	6
	5	SUP	6

Source: Authors

Table 3 : ANOVA for student type versus performance level

Tests of Between-Subjects Effects					
Dependent Variable: Replication					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	155.200[a]	9	17.244	10.558	.000
Intercept	258.133	1	258.133	158.041	.000
Studenttype	.533	1	.533	.327	.574
ClassCluster	134.533	4	33.633	20.592	.000
Studentype * ClassCluster	20.133	4	5.033	3.082	.040
Error	32.667	20	1.633		
Total	446.000	30			
Corrected Total	187.867	29			
a. R Squared = .826 (Adjusted R Squared = .748)					

Since the P-values for interaction effects Studenttype and ClassCluster is p=0.04, we reject the null hypothesis and conclude that there is some difference between the levels of factor A (main effect Student type) and levels of factor B (Class Cluster). The findings in Table 3 above however showed that student type (p=.574) was not statistically significant as opposed to the class cluster with p-value=.000

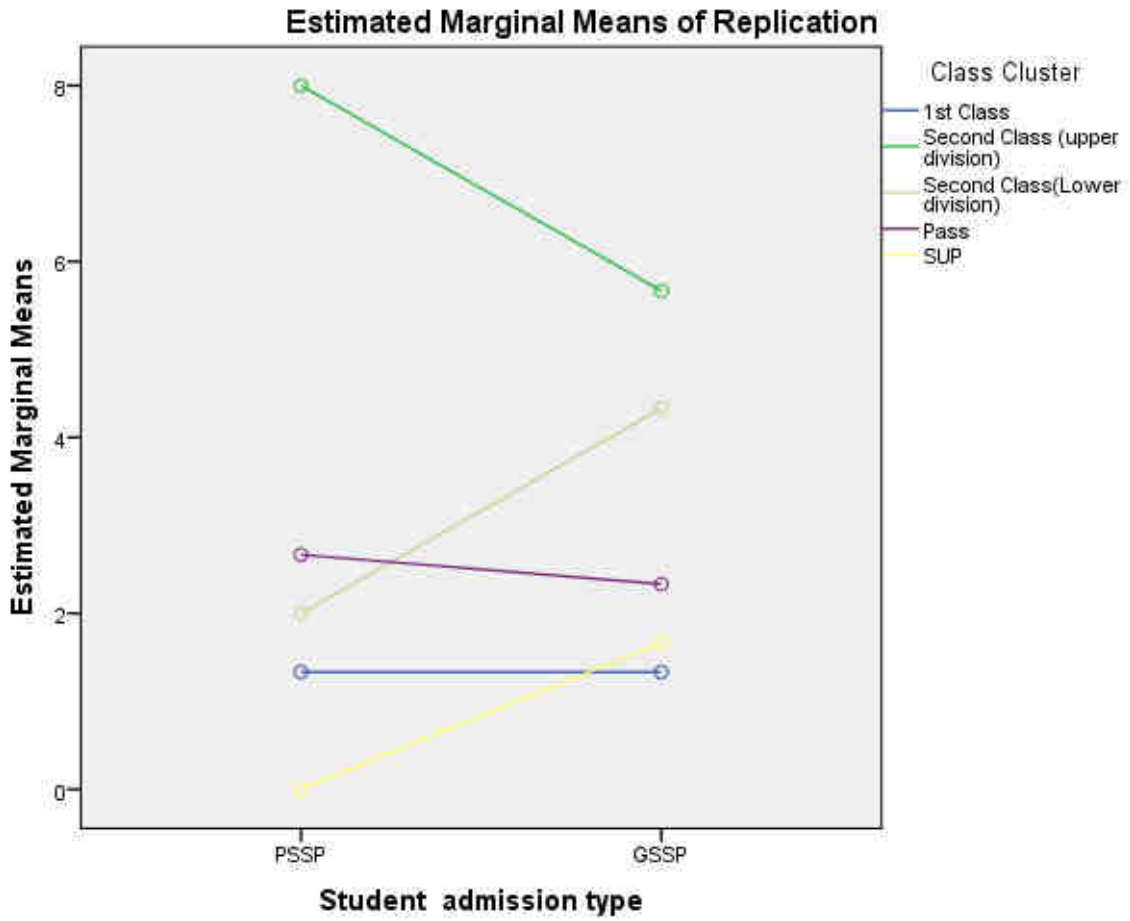
A post hoc analysis for interaction effects(F=3.082, p = .040) needs to be performed since significance was found in the Studenttype* ClassCluster factor interaction. Thus **Turkey HSD** post-hoc was computed as shown in Table 4 below:

Table 4: Post Hoc analysis – Multiple Comparison

Multiple Comparisons						
Dependent Variable: Replication Turkey HSD						
(I) Class Cluster	(J) Class Cluster	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1st Class	Second Class (upper division)	-5.50*	.738	.000	-7.71	-3.29
	Second Class(Lower division)	-1.83	.738	.134	-4.04	.37
	Pass	-1.17	.738	.525	-3.37	1.04
	SUP	.50	.738	.959	-1.71	2.71
Second Class (upper division)	1st Class	5.50*	.738	.000	3.29	7.71
	Second Class(Lower division)	3.67*	.738	.001	1.46	5.87
	Pass	4.33*	.738	.000	2.13	6.54
	SUP	6.00*	.738	.000	3.79	8.21
Second Class(Lower division)	1st Class	1.83	.738	.134	-.37	4.04
	Second Class (upper division)	-3.67*	.738	.001	-5.87	-1.46
	Pass	.67	.738	.892	-1.54	2.87
	SUP	2.33*	.738	.035	.13	4.54
Pass	1st Class	1.17	.738	.525	-1.04	3.37
	Second Class (upper division)	-4.33*	.738	.000	-6.54	-2.13
	Second Class(Lower division)	-.67	.738	.892	-2.87	1.54
	SUP	1.67	.738	.199	-.54	3.87
SUP	1st Class	-.50	.738	.959	-2.71	1.71
	Second Class (upper division)	-6.00*	.738	.000	-8.21	-3.79
	Second Class(Lower division)	-2.33*	.738	.035	-4.54	-.13
	Pass	-1.67	.738	.199	-3.87	.54
Based on observed means. The error term is Mean Square(Error) = 1.633.						
*. The mean difference is significant at the 0.05 level.						

The findings of Post-hoc Turkey HSD in Table 4 indicates that indeed there is some significant difference between GSSP and PSSP students scoring 1st Class, second class (lower division), pass and fail when compared to type of students scoring second class(upper division). The p-values of above mentioned class clusters are p=.000, .001 <0.05. However, the results also showed that students scoring 1st class are uniquely statistically significant when compared to the class clusters. These findings imply that except for 1st class students, there is no difference in students scoring second class honors between GSSP and PSSP students

Figure 1: A graph depicting interaction effect between student type against performance class cluster



From Figure 1 above, the results depict clearly that interaction effect is highly significant between the two factors since the lines intersect, except for students scoring first class honors.

CONCLUSION

The findings of this study show clearly that contrary to the general belief, students on privately sponsored programmes were found to be performing at optimum levels. During the analysis, it was clear that PSSP students score slightly higher in Second class (upper division) than their counterparts in the GSSP category. Nonetheless, the findings further pointed out that GSSP students dominate 1st class honors cluster than the PSSP students. Almost equal proportion of students attained same grade in second class (lower division) and a pass, at the degree classification stage. Surprisingly, far fewer PSSP students sat for supplementary examinations after failing the main exams than their GSSP counterparts.

RECOMMENDATION

The findings of this study are expected to help the Kenyan universities PSSP directorates, managements, faculties of education and KUCCPS to make informative decisions while admitting students who did not meet the minimum qualifying grade for government sponsorship into our local universities. It is necessary to look into policy changes for KUCCPS to come to the support of PSSP students. It is expected that the findings will be useful to policy makers, planners and administrators of higher education. Moreover, findings may also be of

interest to other stakeholders in higher education, such as the Commission for University Education (CUE), students, parents and even employers by avoiding discrimination depending on whether a job applicant was a PSSP or a GSSP entrant.

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