

University Entrance Exam Result and Preparatory Class Average Score as Predictors of College Performance

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ABSTRACT:

The purpose of this study was to assess the degree to which university entrance exam result (UEER) and preparatory class average score (PCAS) predict success in college academic performance. The subjects of this study were 484 students. The data were collected from the Registrar Office. Correlation and regression analyses were employed on the data. The results indicated that PCAS and UEER in order as selection instruments appeared to be valid predictors of first year college CGPA and jointly accounted for 33.70 percent of the variation in college performance. Besides, PCAS was found out to be more important than UEER as admission variable. Based on the findings recommendations were forwarded.

KEYWORDS: Criterion Measure, Predictive Validity, Predictors, Selection Criteria

INTRODUCTION:TM

Background of the Study:

Selection of the most promising students for admission to higher learning institutions has been a focus of concern for many years. Many universities and colleges select prospective students of their program based on a set of their own admission requirements. The selection criteria they usually consider include the candidates' potentials to succeed in their studies, the economic need of the society, the spaces available in the program offering institutions and the like (Evans, 2012; Gayle and Jones, 1973). Therefore, the main goal of their admission criteria is to identify students who can successfully complete the study program they are supposed to attend and further address the needs of the society in their future careers as professionals. Thus, the value of selection criteria can be assessed by the degree to which such objectives are fulfilled. In fact, such an assessment should not be expected to be done at once, but rather as a continuing and systematic evaluation of the selection techniques (Cronbach, 1990; Eggen and Kauchak, 2001).

Candidates for university or college admission should be typically selected based on several variables, which are used as predictors of their potential to perform successfully in training programs (Anastasi, 1997). This is to reveal that when certain variables are used as predictors in the selection process a significant relationship should be made between those predictor variables and the criterion variable, which measure the training performance. Accordingly, questions about the adequacy of predictor variables for the purpose they serve are answerable on scientific grounds by evaluating psychometric evidence (Howell, 1997; Hurlburt, 2003). Most of the predictor variables in selection of students for higher institutions are based on cognitive variables such as test scores, high school average score, entrance examination and the like. Predictive validity studies have been conducted in different corners of the world on some of these selection criteria.

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It was found that high school average scores and test scores were the most important predictors of college performance (e.g.; Burton and Ramist, 2001; Kobrin, Patterson, Shaw, Mattern and Barbuti, 2008; Zwick, 2007). Besides, the combination of high school average score and test scores yield somewhat better prediction than either taken alone (Evan, 2012; Geiser and Santelices, 2007; Noble and Sawyer, 2002).

In Ethiopian, ESLCE had long been the sole requirement a high school graduate had to pass to join higher learning institution until the country made a reform on its education system. High school graduating students were required to pass at least five subjects in ESLCE including Math and English as compulsory in order to join college or university. Many studies have been conducted on the predictive ability of ESLCE results. The researchers studied the predictive validity of ESLCE GPA in relation with first year college or university performance. Accordingly, the findings of some of the studies showed a strong correlation between the two variables while those of the others showed a weak correlation between them. For example, studies conducted by Shenkute (1991) and Tamiru (1992) found out that students' ESLCE GPA efficiently predicted their first year university result; whereas, other studies (e.g., Fantu, Zelalem and Belay, 1996; Kassim, 1999) reported that students' ESLCE GPA was found to be a weak predictor of their university performance.

In the year 1994, the Transitional Government of Ethiopia formulated and implemented a new Education and Training Policy (MoE, 1994) and ESLCE was replaced by other examinations on the basis of the new curriculum designed by the Ministry of Education (MoE). According to this policy, national examinations would be administered at grades 10 and 12. These examinations are known as the Ethiopian General Secondary Education Certificate Examination (EGSECE) and University Entrance Examination (UEE). The EGSECE is administered at the completion of grade 10 while UEE is administered at the completion of grade 12.

The purpose of EGSECE is to certify completion of general secondary education and to select students who qualify for the next level of education. These students then, attend a two-year university preparatory class. Upon the completion of preparatory class, they take the UEE, which serves as an instrument for selection and placement of students for university education in the country (MoE, 2011). Replacing ESLCE, UEE has been in practice since the 2002/03 academic year. There are few researches conducted on the predictive validity of UEE (e.g; Aboma, 2008; Demewoz, Mehadi and Tesfaye, 2005). So far no study have been made that determines the degree of relationships between university entrance exam result and preparatory class average score with first year college academic performance in KCTE. It is this limitation of local studies on important issue that has initiated the investigator to dwell on it.

Statement of the Problem:

In selection and admission process we have to assure whether the criteria we use are valid, whether they (criteria) help us to admit those applicants with the best chance of success, and whether they enable us to eliminate those with the poorest chance of success (Evans, 2012; Gayle and Jones, 1973). Similarly, it is essential to validate the selection criterion (i.e., University Entrance Examination Result) used by the Ministry of Education. No attempt has been done yet, concerning the predictive validity of UEER and PCAS of degree program in KCTE.

The major purpose of this study, therefore, is to assess the degree to which university entrance exam result and preparatory class average score predict success in college academic performance. Based on this purpose, an attempt was made to answer the following basic questions.

1. *Is there a statistically significant relationship between university entrance exam result, preparatory class average score and first year CGPA in college study?*
2. *Do the university entrance exam result and preparatory class average score collectively have significant contribution to the prediction of first year college performance?*
3. *Which one of the predictor variables is more important in explaining the variation in first year CGPA in college study?*

Significance of the Study:

Researchers in the area emphasize the use of the admission criteria that best predict success in college studies. Specifically, Willingham (1974) explained that compared with lower levels of schooling most tertiary programs are costly as well as intellectually demanding. Thus, to minimize human power and resource wastage, it is advisable to use measures that would predict success in a field of study.

Therefore, it is significant to validate the admission criterion used by MoE. Hence, this study would shade some light on how valid the current MoE admission criterion is. From this study the MoE will get some benefit. Specifically, it helps the MoE in understanding the impact of each predictor variable used in this study and makes the necessary arrangements in the weights of the admission variables if necessary. Furthermore, the results of this study may show future directions of research for those researchers who are interested in this area.

Definition of Terms:

According to their usage in this study the following terms are defined in the manner stated below.

1. Criterion measure refers to student's first year CGPA in the college examinations.
2. University entrance examination result refers to the total scores of seven subjects and the maximum possible score is 700 since each subject is scored out of 100.
3. Preparatory class average score refers to the overall average score of the averages of each of grades 11 and 12 scores.
4. Predictive validity refers to the extent to which predictor variables are accurate in predicting or forecasting college performance; the extent of relationship between the predictor variables (i.e., university entrance examination result and preparatory class average score) and criterion measure (i.e., first year college CGPA).
5. Predictor variables refer to the university entrance examination result and preparatory class average score of 2011/12 degree program entrants of KCTE.

List of Abbreviations used in the Study:

1. CGPA - Cumulative Grade Point Average
2. EGSECE - Ethiopian General Secondary Education Certificate Examination
3. ESLCE - Ethiopian School Leaving Certificate Examination

4. GPA - Grade Point Average
5. HSAS - High School Average Score
6. KCTE - Kotebe College of Teacher Education
7. MoE - Ministry of Education
8. PCAS - Preparatory Class Average Score
9. UEER - University Entrance Examination Result

METHOD OF THE STUDY

This part of the study presents the participants and variables of the study, procedure of data collection and method of data analysis.

Participants of the Study:

The participants of this study were degree regular program students who were admitted to the college in 2011/12 academic year. From a total 497 entrants of that academic year, 484 students (i.e., 97.38%) were included in the study. Only 13 students (i.e., 2.62%) were excluded from the study due to incomplete information. Hence, the total subjects of the study were 484 students (171 males and 313 females).

Variables of the Study:

The variables included in this study were predictor (or independent) variables and criterion measure (or dependent variable). The predictor variables were university entrance exam result and preparatory class average score of 2011/12 regular degree program entrants of KCTE. For statistical purposes, the independent variables were identified by the following symbols: X_1 = University Entrance Exam Result and X_2 = Preparatory Class Average Score. The criterion measure used was student's first year cumulative grade point average in the college exam. Thus, the dependent variable was a two semester CGPA at KCTE in the 2011/12 academic year.

Procedure of Data Collection:

Permission to have access to the academic performance records of students admitted in 2011/12 was obtained from the college authorities. Then, the researcher collected student's university entrance exam results, preparatory class average scores and first year academic performance in the college (i.e., CGPA) from the Registrar Office of KCTE.

Methods of Data Analysis:

The following statistical methods were used in the analyses of the data. Descriptive statistics such as means and standard deviations were computed to describe the average score and variability of scores. This was followed by analysis of relationships among variables. Using the Pearson product moment method, correlation coefficients were computed to see the relationships among variables. In addition, multiple regression analysis was conducted to see the contribution of predictor variables for the variations on the criterion measure. Following the regression analysis, stepwise regression analysis was employed to identify and select the predictor variable that best explains the variation in the criterion variable. The above analyses were carried out using SPSS version 20. Alpha value 0.05 was used to test significance of the contribution of each predictor variable and of the linear combination of the independent variables to the dependent variable.

RESULTS OF THE STUDY

This part of the study presents the results of the statistical findings that provide evidence to answer the research questions raised in section one.

Results Obtained Using Descriptive Statistics and Interco relation Matrix

The first research question was concerned with assessing the extent of relationships between university entrance exam result and preparatory class average score to first year CGPA in college study. Accordingly, the results of the study in this regard are summarized in the following table.

[Insert Table1 here]

Table 1 presents means, standard deviations and correlation coefficients of university entrance exam result, preparatory class average score and college first year CGPA. The means of university entrance exam result, preparatory class average score and college CGPA are 314.24, 66.97 and 2.36; their standard deviations are 26.55, 6.25, and 0.55 respectively. This indicates that the mean of students UEER (X1) is below average while the means of their PCAS (X2) and college CGPA (Y) are above average. Concerning the results of standard deviation, there is relatively high variation in their UEER (X1) and PCAS (X2); and a relatively low variation in their college CGPA (Y).

Besides, Table 1 presents the correlation of predictor variables (university entrance exam result and preparatory class average score) with the criterion variable (college CGPA). Higher correlation coefficient was observed between preparatory class average score and college CGPA, $r = 0.563$, $p < 0.01$, which is statistically significant at 0.01 level while statistically significant correlation coefficient was observed between university entrance exam result and college CGPA, $r = 0.214$, $p < 0.01$. On the other hand, the correlation between the predictor variables (i.e., university entrance exam result and preparatory class average score) was $r = 0.129$ which is statistically significant at 0.01 level. This indicates that there is some overlap between the predictor variables. The inspection of the results of intercorrelations among the variables in Table 1 also shows that the directions of the relationships are all positive.

Result of Multiple Regression Analysis

The second research question was concerned with determining the combined contribution of the predictor variables together to the prediction of first year CGPA. For this purpose, a multiple regression analysis was carried out. The results are presented in Table 2.

[Insert Table 2 here]

From Table 2 above, it can be seen that the multiple correlation coefficient (R) obtained is 0.581, which describes the extent to which first year college CGPA is related to university entrance exam result and preparatory class average score. The coefficient of determination (R²) is 0.337, which means the variance accounted for by the predictor variables jointly (or together) is 33.70 percent, $R^2 = 0.337$, $F(2,481) = 122.313$, $p < 0.01$. In other words, when 33.70 percent of the variance in first year college CGPA is explained by the two-predictor variables, the remaining 66.30 percent of the variance in the criterion measure is left unexplained.

Result of Stepwise Regression Analysis

The third research question was concerned with identifying the predictor variable that was more important in explaining the variation in first year CGPA in college study. In order to answer this

question, a stepwise regression analysis was employed. The results are presented in Table 3 below.

[Insert Table 3 here]

As it is indicated in Table 3, preparatory class average score (X2) and university entrance exam result (X1) were entered into the regression model but in different steps. Preparatory class average score was entered into the regression model in the first step. Accordingly, as shown in Table 3, it accounts for 31.70 percent of the variation in first year college CGPA. Thus, preparatory class average score can be said more important predictor variable in explaining the variation in first year college CGPA than university entrance exam result, $R^2 = 0.317$, $F(1, 482) = 223.525$, $p < 0.01$. When university entrance exam result was entered into the regression model in the second step, as it can be seen in Table 3, the prediction of college first year CGPA has improved by 2.0 percent, change in $R^2 = 0.020$, $F(1, 481) = 14.733$, $p < 0.01$.

DISCUSSION

This section of the study presents the discussion of the findings. As far as the first two research questions are concerned, the findings showed significant relationships between the predictor variables and the first year college student's CGPA. As the computation of intercorrelations among variables showed (Table 1), the predictor variables (university entrance exam result and preparatory class average score) are significantly related to the first year college academic performance (CGPA) independently.

In addition to the correlation analysis, multiple regression analysis (Table 2) was worked out and it revealed that the predictor variables together made a significant contribution in the prediction of first year college CGPA, $R = 0.581$, $R^2 = 0.337$, $F(2, 481) = 122.313$, $p < 0.01$. The study indicates that university entrance exam result and preparatory class average score appeared to be important and significant variables in predicting college academic performance. Thus, the selection criterion (i.e. UEE), which was used for university admission in 20011/12 academic year by MoE, along PCAS were found to be significant predictors of first year academic performance so far as students who joined KCTE in that academic year were concerned.

In fact, this study is not the first of its kind since there are some studies that reported similar findings. For example, the study done by Aboma (2008) reported that preparatory school average score, university entrance exam result and aptitude scores appeared to be statistically significant predictors of first semester GPA of the students at Adama University. The result of Aboma's study revealed that the three variables in combination accounted for 17 percent of the variance in students' university first semester GPA.

The result of this study revealed that 33.70 percent of the variance in college first year academic performance was accounted for by variation in university entrance exam result and preparatory class average score. What this means is that about two-thirds of variance, 66.30 percent, remains unexplained.

The possible explanations for such large unexplained variance in first year CGPA may be due to the fact that other factors such as achievement motivation, study habit and specific content background affect performance in college (Eggen and Kauchak, 2001). Besides, researchers

(e.g., Demewoz et al., 2005; Ebel and Frisbie, 1991) indicate that non cognitive variables such as these play an important role in determining students' success in educational activities. Similarly, Geiser and Santelices (2007) state that there are many other factors that affect students' undergraduate experience after admission, such as financial aid, social support and academic engagement in college.

As it is stated in the previous section, the third research question that is to be answered in this study was identifying the predictor variable that is more important in explaining the variation in first year CGPA in college study. In order to answer this question, stepwise regression analysis was computed. The results of the stepwise regression analysis (Table 3) revealed that preparatory class average score was found to be more important variable in explaining the variation in college performance. Preparatory class average score alone accounted for 31.70 percent of the variance on the first year CGPA, $R^2 = 0.317$, $F(1, 482) = 223.525$, $p < 0.01$. This means that students who performed better during the preparatory class also performed better in college. Probably these students had the potential to cope with the academic atmosphere in college more easily than others. This may also imply the relevance of the content being taught in preparatory schools in preparing students for university.

The result that preparatory class average score is the most important variable in explaining the variation in college performance goes along with the results of the previous studies (e.g., Aboma, 2008; Fantu et al., 1996; Yoseph, 2010, 2012), which suggest that high school result (preparatory class average score) is the most important and significant variable in predicting students' ability to succeed in higher learning institutions than other variables. According to Burton and Ramist (2001) and Noble and Sawyer (2002), there are frequent cases in which high school achievement predicted first year grades better than scholastic achievement or aptitude tests. This would not be surprising because high school performance is a work sample of college performance (Wiersma and Jurs, 1990). Furthermore, high school average scores are rather based on performance over a period of time rather than on one-shot evaluation.

The second variable that entered the regression model was university entrance exam result, $R^2 = 0.337$, $F(2, 481) = 122.313$, $p < 0.01$. This means when university entrance exam result was added, R^2 was increased to 0.337. The change in R^2 due to university entrance exam result is significant, change in $R^2 = 0.020$, $F(1, 481) = 14.733$, $p < 0.01$. When university entrance exam result entered, the prediction of college CGPA has improved by 2.0 percent.

This finding is consistent with the result reported by Geiser and Santelices (2007). They stated that significant correlations were observed between college GPA with high school GPA ($r = 0.31$, $p < 0.01$), SAT II ($r = 0.14$, $p < 0.01$), and SAT I ($r = 0.07$, $p < 0.01$). The possible explanation why university entrance exam result contributed less to the prediction of college CGPA could be that this exam is a one shot examination. It is administered every year at one specific moment. Apparently, such examination is susceptible to factors that can distort students' true score. Among others, cheating and examination anxiety during examination can be mentioned.

As it is indicated above, it is not university entrance exam result, but preparatory class average score that accounts for the lion's share of the explained variance in college CGPA. According to

Geiser and Santelices (2007), one hypothesis that may account for the preparatory class average scores to predict cumulative college GPA may be “method covariance,” or the methodological similarity in the way these academic indicators are constructed. That is, both preparatory class average score and cumulative college GPA reflect student performance in a large number of courses taken over a period of time. Both measures are based on similar kinds of academic experiences - term papers, quizzes, labs, end - of - course examinations so that it should not be surprising that prior performance on these kinds of academic tasks tends to be predictive of later performance.

Nevertheless, this study is not free of limitations. Especially the following limitations should be taken into account before any form of generalization can be made of the result of the study. First, as the study was confined to one college, the results may not necessarily apply to students in other colleges and universities. Second, this study focused on some potential student variables affecting performance at college. Non cognitive, institutional and environmental variables that play important role in the prediction of college success (e.g., Demewoz et al., 2005; Ebel and Frisbie, 1991; Eggen and Kauchak, 2001) were not considered. Third, it is known that correlation coefficient is based on the reliability and validity of scores on predictor and criterion variables (Mehrens and Lehmann, 1991). However, there are some defects on the psychometric quality of the tests used by colleges and universities. This study like other predictive validity studies, shares this problem. Hence, to interpret validity data correctly, it is necessary to be aware of this problem. Finally, lack of related studies in similar research settings limited the possible comparisons that could be made.

CONCLUSIONS AND IMPLICATIONS

Concluding remarks: From the preceding findings it may be possible to arrive at the following conclusions.

1. Preparatory class average score and university entrance exam result appear to be valid predictors of first year college CGPA.
2. Preparatory class average score is found out to be the more valid predictor of first year college CGPA than university entrance exam result.
3. University entrance exam result is a statistically significant predictor of first year college performance, but it has low contribution to the variation compared to the other variable considered in the study.
4. The combination of the two variables is found to be statistically significant to predict the academic performance of college students.

The findings of this study seem to have some practical implications to the selection criteria of higher learning institutions of the country and future direction of research. Preparatory class average score was found to be more influential in predicting first year college academic performance than university entrance exam result. Thus, it would be better to consider preparatory class average score as a selection criterion along university entrance exam result on the basis of their importance during admission process. It would also be better to arrange special educational support programs for students with low preparatory class average score and university entrance exam result. Possible assistances such as tutorial classes, guidance on study skills, note taking skills and other basic academic skills can be organized. Finally, it would also

be useful to conduct further study to examine the predictive power of preparatory class average score and university entrance exam result in predicting college academic performance in other universities in Ethiopia along non cognitive variables such as achievement motivation and study habit. Further research on this issue will help in explaining the variation in college first year performance.

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Table 1. Mean, SD and Intercorrelations Matrix among Variables (N=484)

Variables*	Mean	S	X ₁	X ₂	Y
University Entrance Exam Result(X ₁)	314.24	26.5	1.00	0.129**	0.214**
Preparatory Class Average	66.97	6.23		1.000	0.563**
College CGPA(Y)	2.36	0.55			1.000

* * P < 0.01 [Correlation is significant at 0.01 level (2-tailed)]

*The maximum possible results in X₁, X₂, and Y are 700, 100, and 4.00 respectively.

Table 2. Summary of Multiple Regression Analysis (N = 484)

Variables	B	Beta	t	R	R ²	F
Constant	-1.792	-	-5.826**	0.581	0.337	122.313**
X ₁	0.003	0.144	3.838**			
X ₂	0.048	0.554	14.540**			

**p < 0.01, the regression equation is $y' = -1.792 + 0.003X_1 + 0.048X_2$

Table 3. Summary of Stepwise Regression Analysis (N = 484)

Step	Variables	Beta	R	R ²	R ² change	F	F change
	Entered						
1	X ₂	.563	.563	.317	.317	223.525**	223.525**
2	X ₂	.544	.581	.337	.020	122.313**	14.733**
	X ₁	.144					

**p < 0.01

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