Validity Strength of College Entrance Assessment Score and High School Academic Records in Predicting College Academic Performance

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Abstract

This is a predictive validity study which aimed at examining the validity strength of College Entrance Assessment (CEA) scores, EGSLCE (Ethiopian General School Leaving Certificate Examination) and High School Average Transcript (HSAT) in predicting college students' academic success as measured by first year CGPA. For this purpose, 2015 regular program entrants (2nd year regular program students in the year 2016) of Gondar College of Teachers Education were comprehensively taken as participant of the study. Data collected from716 out of 954 participants were found useful and employed for analysis. The collected data were processed using SPSSv16.0. Standard multiple regression and hierarchical multiple regression were used as data analysis methods. Standard multiple regression was employed to estimate the individual and combined contributions of CEA, EGSLCE and HSAT as predictor variables in predicting students' college academic performance. While hierarchical multiple regression analysis was used to check if the addition of EGSLCE and HSAT as admission criteria up on CEA score during the final admission decision enhances prediction of college academic performance. The results indicated that 38.5percent of the variance in college academic performance as measured by first year CGPA is accounted for by the combined predictor variables (CEA, EGSLCE and HSAT). Implying in, jointly these three predictor variables contribute 38.5 percent in predicting college academic achievement. F-test result also indicated that the contribution of these predictor variables in predicting first year college CGPA was found statistically significant $F_{(3,712)} = 148.689$, $p < 0.05$. Of these, CEA scores where final admission decision so far merely relied on accounted 4.9 percent while EGSLCE and HSAT accounted 3.2 percent and 30.4 percent, respectively. Indicating that, HSAT took the largest share of contribution to predict first year CGPA. In the same token, it was found that HSAT has the largest regression coefficient or 'β weight' (.510) as compared to CEA (.140) and EGSLCE (0.099). All these evidence showed that HSAT was found a statistically significant best predictor of college academic performance as measured by first year CGPA. Hierarchical regression and F-test results disclosed that EGSLCE and HSAT do add a statistically significant increment (20.3 percent and 6.2 percent, respectively) to the prediction of first year college academic performance if they were used as predictor variables along with CEA scores during the final admission decision. Based on the findings it was recommended that admission guide lines needs to be revised and mere reliance on CEA score during final admission decisions need to be terminated. And EGSLCE and HSAT have to be used along with CEA score during final admission decision. When combined predictor variables were considered during the final admission decision, maximum weight needs to be placed for HSAT.

Keywords: Validity Strength, College Entrance Assessment score, EGSLCE, High School Average Transcript, first year CGPA.

1. Introduction

Wishing to admit students who will succeed academically in the higher learning institution, admission procedures through which applicants are supposed to pass has been used since many years ago. Although it may vary from country to country, in the admission process academic variables like High School Average Grades, Scholastic Aptitude Test (SAT)and/or American college Testing (ACT), college admission tests, institute based entrance exams/tests, etc., and non-academic variables like evidence letters of extra-curricular activities, recommendation letters are either independently or jointly used (Nobel and Sawyer, 2002).These variables are employed with the belief that they have certain power to predict future college students' academic performance.

In this regard Ethiopia has its own experience of applying admission producers to admit students at college and university level. At university level, the current experience in Ethiopia shows that selection of eligible students has been exclusively relied on scores of National University Entrance Exam held at the end of grade 12th. And admission process used in Teachers Education College has some sort of difference from university. College of teachers' education has its own admission procedure. Practical evidences showed that the admission procedures have been held through the guideline devised by Education Bureau of the Regional State based on Teachers education College students' recruitment guidelines of the Federal Ministry of Education.

Accordingly, selection of students for Gondar College of Teachers Education has been made based on admission procedures devised by the Amhara National Regional State Education Bureau. As to the recruitment guideline, the admission procedure has two basic phases; i.e., Screening phase and the final admission decision

phase. The screening stage is made using EGSLCE and the Average Transcript Score of grade 9 and 10. Each constitutes 50%. They are used simply to select eligible applicants for College Entrance Assessment/CEA. The final admission decision was made merely based on the scores of CEA.

EGSLCE and the average transcript score of grade 9 and 10 were not considered in the final admission decision phase. Their function in the admission process was terminated in the screening stage. This shows the final college admission decision making was entirely relied on CEA score. The roles of EGSLCE and HSAT in predicting future academic achievement seemed to be overlooked. Besides, it is very unclear for the researcher why the final admission decision merely relied on CEA scores. Why certain shares/portions were not given for those two variables/factors. Is it due to the reason that CEA score better predicts college academic success than EGSLCE and HSAT do individually or even jointly? Even, let us assume that CEA score better predicts than EGSLCE and high school transcript do either independently or jointly, what is the matter if these variables have their own share in the final admission decision process. I believe they would really increase the predictive validity strength of college admission procedure and hence get competent college students who will better succeed academically.

As mentioned before, the number one goal of using college admission variables/factors in the admission decision process is to accurately identify and admit potentially successful applicants. And the usefulness of admission variables in achieving this goal depends mainly on their predictive validity strength. It has been empirically evidenced that admission variables/factors used to select students for college/university education have different level of capacity in predicting future academic success. A predictive validity study (High School Grade Point Average (HSGPA) vs Standardized Test) made by Geiser and Santelices (2007) at University of California, for example, show that HSGPA was found better in predicting freshman grades than Standardized test scores. Similarly, another study revealed that high school GPA was found better than college admission test scores in predicting first-year college GPA (Sawyer, 2010). Still the works of Fara (2010) evidenced that increases in high school GPA, increased the likelihood of students' academic success in higher education more than what ACT/SAT does. Implied the predictive validity strength of high school GPA is more than the predictive validity of ACT/SAT.

There are also research findings which disclose the lesser contribution of high school GPA in predicting college performance than college entrance test scores. For example a predictive validity study conducted in Yemeni university by Abdulghani Ali Dawod Al-Hattami (2012) revealed that college entrance test scores have higher correlation coefficients with the criterion variable (college academic achievement) and have greater predictive power of college success than high school GPA.

All these lead to the conclusion that research works regarding which admission variable/factor best predicts students' academic performance in higher studies don't seem consistent. In spite of this fact, at least to the best of my knowledge, particularly in Ethiopian teachers' education context, the issue of identifying the predictive validity power of the commonly used college admission variables/factors is not an exhaustively studied issue. Thus, investigating the admission variable/factor that best forecasts future academic success in our setting is really reasonable. This was one thing that inspired me to conduct this study.

Besides, various predictive validity studies have recommended that relaying on a combination of two or more admission variables during admission decision to select students for higher education is very valuable. With no question this action would strengthen the accuracy of admission decisions. To mention few, it was found that the addition of college entrance test scores to the prediction equation along with high school GPA enhanced the predictive power of college performance (Abdulghani Ali Dawod Al-Hattami, 2012). Geiser and Santelices (2007) also indicated that Standard test scores do add a statistically significant increment to the prediction, so that the combination of High School GPA and test scores predicts better than either High School GPA or Standard test scores alone does.

The existing practices in Gondar College of Teachers Education in particular, in Amhara National Regional State (ANRS) Teachers Education Colleges in general were found different from the above recommendations in terms of reliance on a combination of admission variables during final admission decision. In our case, the final admission decision merely depended on scores of CEA. High school records (scores of HSAT and EGSLCE) which are presumed to have good curricular relationship with college education was totally left behind. They were not considered during the final admission decision making. It is meant, their roles in the admission process were entirely detached during the final admission decision.   This is an existing bold gap which should be filled in through scientific analysis and show how relying on a combination of two or more than two college admission variables better improves the quality of college admission decision than mere relying on a single admission factor during final admission decision. This is another situation that inspired me to conduct this research.

2. Leading questions of the study
This scientific analysis was conducted to look for answers for the following basic research questions.

- To what extent College Entrance Assessment (CEA) scores, EGSLCE, High School Average Transcript (HSAT) individually and jointly predicts college students' academic success as measured by first year college CGPA?
- Which college admission variable (CEA score, EGSLCE or HSAT) is the best significant predictor of college students' academic achievement?
- Does the inclusion of EGSLCE during the final admission decision significantly enhance the prediction of college students' academic performance?
- Does the inclusion of HSAT during the final admission decision significantly enhance the prediction of college students' academic performance?

3. Methodology
3.1Population, Samples and Sampling Techniques
Predictive validity study by its nature requires pre-existing data of both predictor and criterion variable. For this study, for example, data of three predictor variables (i.e., CEA, EGSLCE, and HSAT) and one criterion variable (i.e., college academic performance as measured by first year college CGPA) should essentially be available. To this end, efforts were made to identify from which batch/year students of the college data of these variables could be obtained. First year students (2015 entrants) of the college were not considered in this study, because no one academic year complete college GPA was found when this study was conducted. Similarly, third year students (2013 entrants of the college) were not considered, because it was hardly possible to access their scores of CEA. Finally, it was evidenced that the necessary data of variables included in this study could only be found from 2014 regular entrants of Gondar College of Teachers Education. Thus, regular entrants of the specified year were used as target population of this study. They were 954 in number (based on 2015 2nd quarter report of the college). They were comprehensively considered as sources of data for this study. Implying in, comprehensive sampling technique was employed. Evening students were not considered in this study because entrance assessment scores for the entire batches were not found in a very organized manner as equally as regular students.

3.2 Predictor Variables
The main predictor variables considered in this study were CEA, EGSLCE and HSAT. Each of these variables is described below.
3.2.1College Entrance Assessment (CEA)
Practical experience showed that Teachers Education Colleges found within ANRS in general, Gondar College of Teachers Education in particular used College Entrance Assessment as admission criteria to select students from the applicants. **College Entrance Assessment** is an assessment designed to measure a student's readiness for college academic success. It included written entrance exam, interview, hand writing test, teaching profession attitude test and letter of participation in extra-curricular activity. These are subtests of College Entrance Assessment. Items of entrance exam, interview, hand writing test, and teaching profession attitude test were prepared by selected College of Teachers Education within the region. And participation letter of extra-curricular activity is a letter presented by applicants that approved their participation in the club called the 'future teacher' and of course in other clubs. The maximum percentage score on College Entrance Assessment is 100%. Each subtest consist its own share in the cumulative score (100%). Entrance exam accounts 50%. Interview accounts 25%. Attitude test accounts 15%. Hand writing and approval letter of participation in extra-curricular activity individually accounts 5%. College Entrance Assessment was administered around from September to November every year. The scores of CEA were used to make final admission decisions. According to the teachers' education college admission guideline, the pass-point is 50%+. But evidences revealed that this restriction was not strictly applied particularly when the required number may urge the admission committee to go below this percentage. Scores of this predictor variable was collected from College Entrance Assessment result collection sheet found from the former selection and admission officer of the college, Mr. Teferi Abebe. The reliability coefficient of each subset of college entrance assessment was computed using Cronbach alpha or alpha coefficient and found 0.86 for writing entrance exam, 0.79 for hand writing test, 0.75 for interview and 0.65 for letter of participation in extra-curricular activity.
3.2.2 High School Average Transcript (HSAT)
HSAT in this study refers to the mean percentage score over all subjects taken in grade 9 and 10. For example if a student gets average score of 80 in all subject matters in grade 9, and 70 in grade 10, then his/her aggregated average score will be 75 (the summation of 80 and 70 divided by 2). Thus, 75 would be used in the study as HSAT score. If a participant was preparatory graduate only his/her grade 9 and 10 average transcript was considered for uniformity purpose. Its reliability was computed by Cronbach alpha or alpha coefficient and found 0.89.
3.2.3 EGSLCE
It refers to the scores obtained from the General Secondary Examinations constructed by the Federal Ministry of

Education and administered to all tenth graders across the country at the end of the school year. It was calculated in a 4-point scale (a maximum of 4 points and a minimum of 0 point).It was collected from students' EGSLCE certificate. The reliability coefficient was estimated using Cronbach alpha or alpha coefficient and found 0.79.

3.3 Criterion Variable
3.3.1First year CGPA (Cumulative Grade Point Average)
The criterion variable used in this study was first-year college CGPA which refers to the cumulative average grade point that students obtain in the first two semesters based on a scale with a maximum of 4 points and a minimum of 0 points. Students' (2014 regular entrants) mean GPA (Grade Point Average) of two semesters was considered in this study. It was collected from individual students as regulation of College registrar doesn't allow to have access to results of students in any way. Its reliability was tested by Cronbach alpha or alpha coefficient and found 0.89.

Previous research works discovered that first-year College CGPA is the most commonly used criterion variable in the predictive validity studies of college admission procedures (Wilson, 1983). Pascarella and Terenzini (1991) stated that "First-year grades are probably the single most revealing indicator of . . . successful adjustment to the intellectual demands of a particular college's course of study" (p. 388). Camara and Echternacht (2000) found that first-year College GPA is the most frequently used criterion in predictive studies. They noted that first-year college GPA is favored because it is a well-defined criterion and available relatively soon after students finish high school.

3.4 Procedures of data collection
Data of the variables were collected from documents. The documents were 2nd year regular program students' (2014 entrants of GCTE) academic credentials (i.e EGSLCE certificates, grade 9 and10 average transcript, first year grade reports) and College Entrance Assessment result collection sheets. Students were wisely told in advance by the researcher to bring their academic credentials before semester break. This was made simply to give chance for those whose academic documents were found at their parents' or guardians' home. During the first two weeks of second semester (January 20/2015 to March 01/2015), scores of the variables (EGSLCE, HSAT and first year CGPA) were collected from documents of the respective students directly. Of 954 students, complete data were impossible to collect from 238 students. The reasons were mainly associated with loss of one of the required documents and failure to recall the message to bring their academic credentials. Therefore, data collected from 716 students (70.05% from the expected data sources) were found valuable and used for analysis. Accordingly, CEA scores of 716 students were collected from the respective result collection sheet (which was personally taken from Mr. Teferi Abebe, the former selection and admission officer of the college). All the data collection activity was made by the researcher himself.

3.5 Data Analysis
Data analysis for this study included both descriptive and inferential statistics. Descriptive statistics were computed for predictor variables (CEA score, EGSESCE and HSAT) and for the criterion variables (first-year CGPA). In descriptive analysis mean scores, maximum and minimum values of the predictor and criterion variables were used simply to examine the average behaviors and the last maximum and minimum scores of students, respectively.

In Inferential statistics, standard multiple regression and hierarchical multiple regression were chosen as statistical methods. Standard multiple regression was employed to examine the extent to which predictor variables (CEA, EGSLCE and HSAT) jointly and individually contribute in predicting criterion variable (college academic performance as measured by first year CGPA). Because, standard multiple regression analysis provides the proportion of explained variance, also known as the *coefficient of determination* or R^2 in the criterion variable (first year College CGPA) that is accounted for or explained by the combined predictor variables (CEA, EGSLCE and HSAT). At the same time, the analysis results provide standardized regression coefficients of each predictor variable which is an indicator of the relative prediction strength of the predictor variables. In regression analysis, the following prediction equation or model is often used:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

where 'Y' is the predicted or dependent variable, 'X_1' is the score on the first predictor variable (CEA), 'X_2' is the score on the second predictor variable (EGSLCE), and'X_3' is the score on the third predictor variable (HSAT). 'a' is the constant or intercept, representing the amount that the dependent variable will be when all the independent variables are zero. The regression coefficients (β_1, β_2, and β_3) represent the amount that criterion variable (first year CGPA) changes when the corresponding predictor variable changes one unit, all other factors held constant. Finally, 'e' stands for prediction error or statistical noise (the difference between observed value and predicted value of the dependent variable). F-test and t-test were used respectively to examine whether the joint and individual contribution of predictor variables in predicting criterion variable is

statistically significant.

Hierarchical multiple regression analysis was employed to examine whether the addition of EGSLCE and HSAT up on CEA score in the final admission decision enhances/improves the prediction of first year college academic performance. In this study, hierarchical regression has three blocks as there are three predictor variables. Hence, score of CEA, EGSLCE and HSAT were entered in these regression blocks- Model 1, Model 2 and Model 3, respectively. This order-of-entry feature, where some predictors are considered before looking at others, is what makes this a "hierarchical" regression procedure – some variables take precedence in the hierarchy over others. For this study, CEA score took the priority/precedence and was entered into the first model (block1) because this is a predictor variable where its proportion of explained variance (R2) in first year CGPA accounted by it was taken as frame of reference (starting point) and then the increments of prediction when EGSLCE and HSAT were added in the prediction equation would be evaluated. Or in short, this is a variable that the researcher wants to control. R^2 change statistics in the output table is used to evaluate how much predictive power was added to model 2 and 3 by the addition of the next two predictor variables in step 2 and 3, respectively. The magnitude of R^2 change in Model 2 and Model 3, therefore, indicate the level of increment/improvement to the prediction of first year GPA when EGSLCE and HSAT were added in the final admission decision, respectively. This again indicates the level of improvements of admission decision accuracy if EGSLCE and HSAT were included in the final admission decision. F-test was also used to declare whether the increment information for the prediction of first year CGPA is statistically significant. All the analyses were processed using SPSSv.16.o

To apply multiple regressions as data analysis method assumptions of i.e., Normality, Linearity and Homoscedasticity are expected to be satisfied. But in this study as there is no plan to compare groups on the bases of mean difference of variables, there is no need to test the homoscedasticity (homogeneous of variance between groups). Thus, assumption of homoscedasticity was not considered here and **SPSS** was only commanded to produce the output needed to evaluate the assumption of normality and linearity. The results revealed that all the variables satisfied the criteria for normal distributions because the skewness and kurtosis of data distribution of the variables were found between -1.0 and + 1.0 (see table 1). Many literatures suggested the assumption of normality is satisfied if the variables' distribution of skewness and kurtosis is within the range of-1.0 and + 1.0.

The assumption of linearity was also satisfied. Because the SPSS output of correlation analysis command indicated though the magnitude varies there existed a significant correlation between predictor variables and criterion variable (see table-2). Implying in, there existed linear relationship between CEA, EGSLCE and HSAT as predictor variable, and first year CGPA as criterion variable.

3.6 Results and Discussion

Leading Question number 1 and 2: To what extent College Entrance Assessment (CEA) scores, EGSLCE (Ethiopian General School Leaving Certificate Examination), High School Average Transcript (HSAT) individually and jointly predicts college students' academic success as measured by first year college CGPA? Of the three predictor variables which one is the best significant predictor of college students' academic achievement?

As displayed in table 3 the standard multiple regression result showed 38.5 percent of the variance in first year college CGPA was accounted for by CEA score, EGSLCE and HSAT jointly. F-test result also indicated that the combined contribution of CEA score, EGSLCE and HSAT as predictor variables in predicting first year college CGPA was found statistically significant $F(3,712)=148.689, p<0.05$. An explained variance or "R square" of this magnitude is generally considered a strong result in predictive validity research, where R-squares of 20 percent or even less are usually considered sufficient to "validate" the use of a particular selection factor in college admissions or other "high stakes" educational decisions. An explained variance of 38.5 percent also implies that 61.5 percent of the variance in college CGPA is unaccounted for and unexplained by this study. It is to mean 61.5 percent of the variance in college CGPA is associated with other factors. In fact, this result should not be surprising given that there are many other factors that affect students' college experience after admission, such as financial aid, social support and academic engagement in college.

Predictor variables' individual contribution in predicting first year College CGPA was also analyzed using their regression coefficients and portion of explained variance (which can be estimated using $R^2=\beta_1 r_{1y}+ \beta_2 r_{2y}+ \beta_3 r_{3y}$) as presented in table 3. Of the joint explained variance, HSAT accounted 30.4% while CEA score and EGSLCE accounted 4.9% and 3.2 %, respectively. This showed large portion of variance in first year college CGPA was explained by HSAT.

Regression coefficients (β weight) as another indicator of the relative predictive strength of the predictor variables were used to compare the individual contribution of CEA score, EGSLCE and HSAT in predicting college students' academic performance as measured by first year CGPA. Result presented in table 3 indicated that 'β weight' of HSAT (.510) was found to be the largest compared to CEA (.140) and EGSLCE

(0.099). In fact although 'β value' of the three predictor variables vary in size/magnitude, they were found statistically significant (t=4.396,p<0.05, df=712); (t=3.087,p<0.05,df=712) and t=15.327,p<0.05,df=712, respectively). Both the portion of explained variance and magnitude of 'β weight' showed HSAT is the best predictor of first year CGPA. This finding is pertinent to the findings of various predictive studies which indicated high school result (to use their exact word but it may include high school transcript and grade point average resulted from National examination offered at the end of high school education) is the best reliable predictor of freshman academic performance (Hu, 2002; Sawyer, 2010). A predictive studies conducted in Ethiopian context also asserted that high school average transcript is a valid predictor of students' academic performance at colleges and universities (NegussieTamiru, 1996; Daniel Zewdu, 1998).

The observation of greatest prediction strength of HSAT in this study might be associated with factors like (1) the existence of strong curricular relationship between high school and college. (2) Its relative representativeness of students' academic behavior. As compared to College Entrance Assessment score and EGSLCE, scores of HSAT were collected in a long time sitting and reflects students' cumulative performance over a period of years in a variety of subjects. And relatively speaking, academic scores collected in a long time sitting by far better consistently represent students' academic behavior than collected in a short time session. This leads to the conclusion that students who have better scores in HSAT are more likely to do the same in college. But in case of College Entrance Assessment, the scores were obtained in a short time span and hence less likely to assume it would consistently represent students' academic behavior. Besides, its inclusion of non-academic subset (i.e extra-curricular activity participation letter) though it accounts small fraction (i.e.,5%) during admission decision and the weak link of its curriculum with the curriculum of college might have their own contribution for not to have as greatest contribution as HSAT has in predicting students college academic performance.

Regarding the relative low predictive strength of EGSLCE, the homogeneity of scores of respondents might be the supreme reason. As known, college applicants average score of EGSLCE ranges between 2.00 and 4.00 and correlation coefficient is affected by homogeneity of scores (low size variance) of sample units. Again regression coefficient is related with correlation coefficient. Thus, it is very difficult to expect large portion of explained variance and magnitude of regression coefficient from this variable. But still it has statistically significant contribution in predicting future academic performance.

Leading question number 3 and 4: Do the inclusion of EGSLCE and HSAT during the final admission decision significantly enhance the prediction of students college academic performance?

To find answers for these leading questions, hierarchical multiple regression analysis was implemented. To compute this kind of regression, scores of CEA, EGSLCE and HSAT were entered in regression blocks, (Model 1, Model 2 and Model 3), respectively. Then, change in R^2 (coefficient of determination) was evaluated to see whether the addition of EGSLCE and HSAT to the prediction equation (i.e., the final admission decision process) provided incremental information for the prediction of first-year college GPA or not. In model 1, first-year CGPA was regressed on score of CEA to estimate its independent R^2 which would be used as frame of reference or starting point to evaluate change of coefficient of determination (R^2 change) to be observed as the result of the addition of the next predictor variables in their respective regression models. Then in Model 2, first-year college CGPA was regressed on CEA score along with EGSLCE. Coefficient of determination (R^2) and change of coefficient of determination (R^2 change) when EGSLCE was added to the prediction equation (i.e., the final admission decision process) were presented in table 4. The results presented in table 4 showed that R^2 went up from 0.121 to o.182. A 0.062 R^2 change was observed. Implying in, 6.2% increment/improvement to the prediction of first year college CGPA was observed because of the addition of EGSLCE during the final admission decision making process. Although percentage of R^2 change observed due to the addition of EGSLCE as a predictor variable in Model 2 seemed low (6.2%), it made a statistically significant contribution to the prediction of college academic performance F(1,713)=53.890,p<0.05.

In the same token, in Model 3 first-year College CGPA was regressed on CEA score along with EGSLCE and HSAT. The results presented in table 4 indicated that R^2 went up from 0.182 to 0.385. A 0.203(20.3%) increment of first year college CGPA prediction was observed when HSAT was considered along with CEA and EGSLCE during admission decision. Implied when HSAT was used as predictor variable together with CEA score and EGSLCE in predicting college academic performance, the prediction would be enhanced by 20.3%. F-test result also displayed that this greatest increment was found statistically significant F (1,712) =234.908, p<0.05. This again implies, the independent contribution of HSAT to the explanation of the variance in first year CGPA is by far greater than EGSLCE. But it is also important to note that though there existed a difference in terms of magnitude of contribution, the result of t-test indicated that the contribution of both predictor variables is statistically significant. Thus, inclusion of HSAT and EGSLCE during the final admission decision is important as they accounted for a considerable amount of additional variance in first-year college GPA when added to the prediction equation (i.e. the final admission decision). Again it is possible to argue confidently that inclusions of EGSLCE and HAST during teacher education college admission decision tended

to improve the fairness and accuracy of admission decisions. While doing so, it is also important to note that greater weight should be placed for HSAT because it accounts for the largest share of the predicted variance in first year college CGPA

3.7 Conclusions

- The three predictor variables (CEA, EGSLCE and HSAT) jointly better contribute in predicting college students' academic performance as measured by first year CGPA than any one predictor alone variable does.
- CEA seemed failing to serve its purpose as expected. Because as it is the only predictor variable through which the final teachers education college admission decision was passed, its contribution in predicting first year CGPA should by far be greater than at least what other predictor variables do.
- Of the three independent variables, HSAT was found the best statistically significant predictor of teachers education college academic performance as measured by first year CGPA. Of the two remaining predictor variables, though the numerically difference is not as such big, College Entrance Assessment score was found the next better predictor variable while EGSLCE took the last rank in predicting college students academic performance.
- The prediction of college academic success as measured by first year CGPA was statistically and significantly enhanced when HSAT and EGSLCE were used together with CEA scores as admission criteria during the final teachers' education college admission decision. Statistically remarkable improvement to the prediction of college academic performance was observed when HSAT as admission criterion was added to the prediction equation (i.e., the final college admission decision). EGSLCE on its part yield a small but statistically significant improvement in predicting students' academic achievement when it was included as admission criteria in the final admission decision along with scores of CEA and HSAT.

3.8 Recommendations

- As it was an admission criteria where the final admission decision was passed on its mere consideration, CEA should have by far better predictive strength than HSAT in which its function or role in the admission process was terminated during the screening phase. Again statistically significant prediction increment (though the magnitude varies) of college academic performance was observed when HSAT and EGSLCE were considered as admission criteria/factors during the final admission decision. All these call for the need to review teachers' education admission guide line adapted by ANRS Education Bureau in the way that gives chance for HSAT, EGSLCE and even others to be considered in the final admission process.
- In this study it was observed that scores of CEA, EGSLCE and HSAT jointly as predictor variables better contribute in predicting college academic success than any one (even HSAT) alone did. Improvement or increment to the prediction of college academic performance when EGSLCE and HSAT were used along with college entrance assessment score during final admission decision was also observed. It is therefore, very important to consider the combination of scores of HSAT, CEA and EGSLCE during the final admission decision rather than mere dependence on scores of CEA. And as the contribution of HSAT among these three predictor variables in predicting students' academic success was found remarkably the highest, the largest/maximum weight should be placed for it when used as admission criterion during final admission decision.
- Observation of relatively minimum but statistically significant contribution of CEA score might be associated with its weak link with college curriculum. Thus, those Teachers Education Colleges assigned by ANRS Education Bureau to prepare entrance assessments should make sure that entrance assessment tools/items are really linked with college curriculum.
- The researcher hoped that this study serves as a baseline for further research to better understand the nature of the predictive validity of the predictor variables (i.e., HSAT, EGSLCE and CEA scores). It is believed that this study is a small scale investigation which only included 2014 entrants (2nd year students in the year 2015) of Gondar College of Teacher Education and first year CGPA as effect/criterion variable. But it could also be conducted through including other batches from the same college as well as from other teachers education colleges found within ANRS, and second and third year CGPA as effect variables to evaluate the consistent predictive measures of predictor variables and hence make the study relatively large scale investigation

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Tables

Table1: Minimum and Maximum value, mean and standard deviation of Variables considered in the study

Variables	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
CEA(IDV)	45.50	76.00	56.4646	5.54416	-.236	.091	.925	.182
EGSLCE(IDV)	2.00	3.80	2.5259	.36468	.953	.091	.822	.182
HSAT(IDV)	51.38	81.20	66.3649	6.90311	.482	.091	-.004	.182
First year CGPA(DV)	1.80	3.67	2.4595	.33211	.495	.091	-.192	.182
Valid N (list wise)=716								

Table 2: Correlation Coefficients between Predictor Variables and First-year College CGPA

Predictor Variables	N	First year CGPA(r_{xy})
CEA score	716	.347**
EGSLCE	716	.327**
HSAT	716	.597**

**= Correlation is significant at $p<0.01$ level (2-tailed).

Table3. Individual and joint contributions of CEA score, EGSLCE and HSAT in predicting First-year College CGPA and their regression coefficients

Multiple R=.621	Coefficient of determination (R^2)= .385
Adjusted R^2=.383	Percentage of joint Contribution=38.5%
	Std. Error of the Estimate=.26096

ANOVA table

Df		Sum of Squares	Mean Square	F	Sig.F
Regression	3	30.377	10.126	148.689	.000
Residual	712	48.487	.068		
Total	715	78.864			

Regression coefficients and portion of explained variance	$R^2=\beta_1 r_{1y} + \beta_2 r_{2y} + \beta_3 r_{3y}$

Predictor Variables	B	SEB	Beta(β)	t	Sig.t	% of Explained Variance
CEA score	.008 .	002	.140*	4.396	.000	4.9 %
EGSLCE	.090	.029	.099*	3.087	.002	3.2%
HSAT	.025	.002	.510*	15.327	.000	30. 4%
(Constant)	133	.120		1.102	.271	

* =Regression coefficients are significant at p<0.05

Table4. First year college CGPA prediction improvement due to the addition of EGSLCE and HSAT up on College Entrance Assessment scores during the final admission decision

Model	R	R square	Adjusted R^2	SE of the Estimate	Change Statistics					
					R^2 Change	% of R^2 change	F Change	df1	df2	Sig. F Change
1	.347[a]	.121	.119	.31167	No change	-	97.857	1	714	.000
2	.427[b]	.182	.180	.30073	**.062**	**6.2%**	53.890	1	713	.000
3	.621[c]	.385	.383	.26096	**.203**	**20.3%**	234.908	1	712	.000

a. Predictors: (Constant), College Entrance assessment

b. Predictors: (Constant), College Entrance assessment, EGSLCE

c. Predictors: (Constant), College Entrance assessment, EGSLCE, HSAT.

Boldface indicates R^2 Change is statistically significant at p<0.05