

**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF PSYCHOLOGY**

**THE PREDICTIVE VALIDITY OF THE CRITERIA USED FOR THE
SELECTION OF CANDIDATES FOR THE HEALTH SCIENCE
COLLEGE AT AWASSA**

By
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COLLEGE AT AWASSA**

**A Thesis presented to the school of graduate studies, Addis
Ababa University, in partial Fulfillment of the Requirement
for the Degree of Master of Arts in Educational psychology**

**By
Samson Fekadu**



**July 2007
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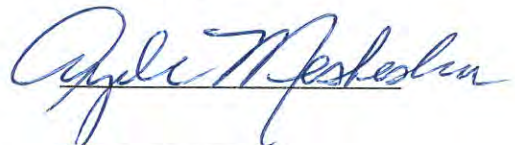
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ACRONYMS AND ABBREVIATIONS

ESLCE – Ethiopian school leaving certificate Examinations

EGSECE – Ethiopian General Secondary Education certificate Examinations

EHEECE – Ethiopian Higher Education Entrance certificate Examinations

GPA – Grade point Average

AAU – Addis Ababa University

SNNPR – Southern Nations Nationalities and peoples Region.

AHSC – Awasa Health Science College

ABSTRACT

The issue of student selection for different training college has been a subject of scientific enquiry for many Years. The enrolment increase with limited resources, for example, makes it necessary for a college to evaluate selection criteria designed to identify those who will become professionals in the field. The purpose of this study was to assess the predictive validity of the selection criteria used were entrance examination results and ESLCE/EHEECE GPA. Besides this, High school average scores were also considered as additional selection criteria in the study. The criterion measure used was the training performance scores throughout the training program.

The subjects of the study were 281(male = 176 and Female =105) trainees who have been admitted to AHSC in 2004 and graduated in 2006 attending three series of regular programs. For the purpose of this study; the subjects were classified into four sub groups (clinical nurse, pharmacy, laboratory and midwife) with respect to their fields of study.

Results of the study indicated that the selection criteria have different predictive power in each subgroup. Entrance examination was found to be the best predictor of college GPA in each of the subgroups except the midwife field of study. But ESLCE/EHEECE GPA was also better predictor of college GPA in the case of clinical nursing field of study only. In fact, the addition of another variable (high school average score) to those predictors improved the prediction accuracy in all fields of study. Finally, suggestions were given so as to improve the prediction power of one (ESLCE/EHEECE) selection criteria.

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

The purposes of tests are many. They are used to understand pupils, evaluate their success and failure and to identify their assets and liabilities. Tests are used for administrative purposes such as for selection, classification and description of students or persons who are to be employed and so on (Thorndike, 1982, Walsh, 1989, Yusuf, 1989).

As Worthen and Sanders (1987) indicated in most advanced nations, education is increasingly viewed as a primary means for solving social problems. Indeed, in some cases the future welfare of nations has been placed squarely on the shoulders of schools and universities.

There are numerous situations in which such decisions could be made and consequently decisions about people are needed. In education; for example, hiring of school teachers, selecting students for admissions to college or professional school, decisions to promote or fail students and illustrate the varied need for prediction (Anastasi, 1976; Jameson and Ottobre, 1976; Ogunniyi; 1984).

Some institutions suffer when inaccurate selection decisions are made either from losing a potentially productive individual or devoting precious resources a person who does not fit in the institutions (Hogrebe, et al, 1983; Gottheil and Michael, 1957;

O'hara and Reith, 1966). However, the selection of students who demonstrate a higher probability of successful academic performance in training program is the goal of most admission criteria. The objective of admission criteria is, in fact, to identify candidates for certain training program who will complete the training program (Gough et al, 1963, Jameson and Othobre, 1967, Orring, 1967). The value of selection criteria, then may be appraised by the degree to which it can fulfill such objectives. Such an appraisal should not be considered as something to be done at once, but rather as a continuing and systematic evaluation of the selection techniques (Hogrebe et al, 1983).

Hence, applicants should be typically selected on several variables which are used as predicators of their potential to perform successfully, in training program (Anastasi, 1976, Frankel and Wallen, 1993). This is to reveal that when specific variables are used as predicators in the selection process, a significant relationship should be made between those predictor variables and the criterion 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 (Messick, 1980 cited in O'thuon and Kishor, 1994).

Consequently, most of the predictor variables in selection of students are based on intellectual evidence such as high school ranks, high school academic scores, test scores, patterns of courses and the like (Bressel, 1977, Michael et al, 1963, Petery and Craft, 1976). It has been found out that high school ranks as predictor generally given higher correlation with college grades than any other types of data (Fantu et al, 1996, Houston, 1983,

Oliver, 1985; Snyder and Elmore, 1983). Whereas various types of academic aptitude and achievement tests take a second place (Kerlinger, 1992; Lanier and Chisson 1975; Halpin et al, 1981, Price and Kim; 1976). The combination of high school scores or ranks and test scores yield somewhat better prediction than either taken alone (Aleamoni and O'boler cited in Nitko, 1983, Halpin et al, 1976; Houston, 1983).

In Ethiopia, before its termination, the Ethiopian school leaving certificate Examination (ESLCE) has served as the sole instrument of selection and placement of students in colleges and universities of the country. Lot of research works has been conducted to know and determine the reliability and validity of this examination. Investigating the extent of the predictive validity of the ESLCE was the point that drew the attention of most researchers.

Many researchers had conducted predictive validity studies on the ESLCE and given their conclusions and suggestions. A thorough investigation of most of these studies has shown that, some of these researchers have concluded that the ESLCE is efficient in predicting future success (Belay 1990, Tameru 1992) while others disagree with this conclusion (Tibebe 1992, Fantu, et al, 1996). Many of them found it to be weak in predicting future performance in college. As a result some researchers have attempted to use other alternative measures such as aptitude tests, achievement tests and high school scores (Kebede, 1991; Mekonnen et al, 1991).

Besides this, some studies have been conducted regarding the predictive validity of admission criteria of some training institutions in the country (Belay, 1990; Meresa, 1994; Shenkute, 1992; Mohammed, 2004). Each of these studies was carried out on different institutions because they have their own admission criteria in selecting applicants. In fact, evaluating the admission criteria of one of these institutions is not an end by itself but rather requires a continuous assessment from time to time. Regarding this, some researchers like Leners et al, 1996, have suggested that the screening instruments should be re-evaluated yearly for their validity and usefulness. On the other hand; the findings of each of these institutions cannot be inferred from other institutions due to their differences in selection criteria in general.

Some of the institutions in Ethiopia that requires evaluating the predictive power of its selection criteria are Health Science colleges. In different countries, even though considerable research in health education has been directed toward development of selection criteria, stable predictor variables have yet to be identified (Crane et al, 1987; Oliver, 1985). Recently Leners et al (1996) have questioned whether screening on the basis of GPA alone truly identifies the quality of nursing trainees the society would demand. The literature, however, did reveal that pre-nursing GPA and high school rank (HSR) were cited as most frequent predictors of academic performance (e.g. Grippando, 1986; Oliver, 1985; Plapp et al, 1965). They also reported a significant relationship between science subjects and admission test scores taken prior to admission and academic performance in Health Science colleges. Although minimum

grades and test scores may be used, students who meet these criteria are usually not automatically admitted (Whitney; 1989). According to him, there are far more applicants who meet the minimum required, for example, in the health profession. As a result he further noted that additional non-test data (e.g., prior grades, background characteristics should be considered in making the final decisions.

In Ethiopia, however, Health Science colleges admit candidates who have completed high school education through selection criteria to produce well trained individuals in the health profession. According to information obtained from Regional Health Bureaus, the Ministry of health has given the mandate of selecting and assigning applicants to nursing schools to the respective Regional Health Bureau with general guidelines. But, since 2003 the nursing schools have grown to Health Science college and the Regional Health Bureau has given the mandate of selecting and assigning applicants to Health Science college to that college with general guidelines. Having this as a framework the college screens its applicants who fulfill some basic requirements. Among the requirements is high school transcript, ESLCE/EHEECE grades in the natural sciences including mathematics and English, (the ESLCE GPA equivalent to that used by colleges for admitting students into diploma programs in the country a minimum of 60% of the score entrance examinations prepared by the college.

Eventhough the general selection requirements are the same for all regions, using the ESLCE/EHEECE results and preparing entrance examinations may vary from region to region. For

example, if the number of applicants with higher EHEECE and entrance examination results exceeds the quota required for a region, those applicants with better EHEECE/ESLCE and entrance examination will have a greater chance to be selected. But those who rejected, in spite of fulfilling the basic requirements for selection, may have a chance of being selected in some of other regions. In another case, one cannot evaluate the entrance examination results of each region in combination. This is because they are differently prepared, administered, scored and interpreted. As a result there is variation in the selection criteria among regions in general. It is, therefore, essential that there would be evidence of predictive validity for each region separately. Having this in mind, the consideration of this study is to assess the selection criteria used in Southern Nation Nationalities and People Region (SNNPR).

Evaluating the validity of such selection criteria for selecting potentially talented individuals to the Health Science colleges might help to reduce wastage of resources which, otherwise could be spent on candidates that may not benefit from the training program. Moreover, the interest of the employer, the applicant and the public at large, are also best served when such selection is made through valid measuring devices. The present study, thus, attempts to assess the selection criteria, i.e., ESLCE/EHEECE GPA and entrance written examinations in order to draw valid conclusion regarding their predictive power.

1.2 Statement of the Problem

In spite of the common difficulties inherent in prediction studies, several researchers have conducted studies on the predictive validities of admission criteria with respect to academic success in colleges. The lack of reliable and valid selection criteria accounts for a major portion of the difficulties that have hindered the development of more successful outcomes of many training programs (Gottheil and Michael, 1957). When seen in light of this argument, valid selection criteria are required not only when there are more applicants than there are places for students. It is not only desirable to reduce the number of students who fail to graduate but also is desirable in order to choose students who will become professional in the field (Gottheil and Michael, 1957; Gross and Perry, 1983).

Therefore, looking for better predictions of success and screening of applicants who will be well trained in specific area require the use of empirically valid and reliable selection devices. To the best knowledge of the writer no research has been conducted so far in an attempt to establish the predictive validity of the selection criteria used for the Health Science college in SNNPR.

The purpose of this study is thus, to evaluate the predictive power of the selection criteria i.e., entrance examination results and ESLCE/EHEECE GPA, in respect of first; second and third year academic average achievement scores of trainees in the Health Science colleges.

The study tries to answer the following basic questions:

- 1 Is there a significant relationship between ESLCE/EHEECE GPA with first, second and third year academic achievement?
- 2 Does Entrance examination have statistically significant relationship with first, second and third year academic achievements?
- 3 Do ESLCE/EHEECE and Entrance Examination result collectively have statistically significant relationship with first, second and third year academic achievement earned by trainees in the Health Science college?
- 4 Which year's academic achievement does the selection criteria predict better?
- 5 Does high school average score improve prediction of the trainee's academic achievement in training institutions if it was used in combination with the initial predictor variables?

1.3 Objective of the Study

The objectives of this study are:

- To evaluate the predictive power of ESLCE/EHEECE results in predicting academic performance of trainees.
- To investigate the contribution of the entrance examination result in the prediction of academic performance of trainees.
- To assess whether or not the addition of high school average score will improve the prediction of trainee's academic performance.

1.4 Significant of the Study

Developing a desirable selection criteria does not only assist in decision making in the selection of candidates for health science college, but it also serve as a pre-requisite to ensure that properly trained and qualified trainees are produced. To attain this, the designing suitable devices and procedures should be made in recruiting and selecting candidates for training programs. Therefore, the findings of this study are expected to:

- Evaluate which independent variables are significant in predicting academic performance of trainees.
- Identify which independent variable is likely to be a better predictor of the first, second and third year academic performance of trainees.
- To identify some problems related to the selection of candidates and thereby provide information for improving the practice of admission to the health science college.

1.5 The Scope and Limitation of the Study

Even though there are other regional colleges having health training program, the study is limited to Awassa Health Science College (AHSC). Most of the trainees enrolled in this college have come from SNNPR. The study is limited to trainees who were selected by SNNPR Health Science colleges and then assigned to Awassa Health Science College.

1.6 Operational Definitions of Important Terms

Variables and terms which are frequently used in this study are defined as follows.

- Academic achievement is an average score obtained in the training program.
- Criterion variables are the first, second and third year average scores which are used as validation the selection criteria.
- High school average scores is the average of the sum total of scores earned by students while studying from ninth to twelfth grade.
- Predictive validity refers to how significantly each predictor variables predicts the criterion measures obtained at the end of the first, second and third year of training program.
- Selection criteria are defined as requirements fulfilled by applicants to be admitted into Health Science College.

CHAPTER TWO

2 REVIEW OF RELATED LITERATURE

2.1 Nature of Validity

Tests and other evaluation instruments serve a variety of purposes in college. Regardless of the type of instruments used or how the results are to be used, all measurements should possess certain characteristics. One of the most essential of these is validity. Several researchers (Anastasia, 1976; Grondund, 1985; Nitko, 1983; Slavin, 1994) viewed the validity of such instruments with reference to the soundness with which they can be interpreted in a particular way or the usefulness of test scores for a particular purpose.

The question of validity is different from the question of appropriateness, for validity can not be satisfied only on the basis of a test meeting its own objectives (Anastasi, 1976; Tuckman, 1975). Distinction has been shown that while appropriateness uses internal criteria, i.e., the test's own objectives for its evaluations, validity requires external criteria of whatever the test is designed to measure. The answer to the general question of a test of validity depends on the purpose of the test and the context in which the test is intended to measure. Nitko, (1983), Koul, (1988) believes that one should not ask a general question, the pertinent question to ask is "How valid is the test for the decision?" or more generally, "for what decision is the test valid?" It is also reasonable to believe that one should avoid thinking of evaluation of results as valid or invalid. It is unlikely then any test will ever have perfect validity for any

decision, because some error may be bound to occur (Mehrens and Lehmann, 1984). Thus, it is best considered in terms of categories that specify degrees such as high, moderate and low validity (Gronlund, 1985; Gruister and Kamp, 1984).

Accordingly, some authors (Gleser, 1960; Gronlund, 1985; Koul, 1988; Nitko, 1983) confirm that a test which helps in making one decision at a particular research situation may have no value at all or is less valid for other situations. Because there is no single validity question, rather different kinds of validity questions exist. Each question may view the test from different perspective. As a result, with out some evidence of the validity of a test for a particular group it is then unwise to use it for the purpose of decision (Anastasi, 1976; Fraenkel and Wallen, 1993; Tuckman; 1975).

2.1.1 Criterion – related validity

Criterion- related validity pertains to the empirical techniques of studying the relationship between the test score or other measures (predictors) and some external measures (criteria). Distinctions are often made between two types of criterion – related validity, predicate validity and concurrent validity (APA, 1974 Cited in Nitko 1983).

There are two types of distinctions between these types of criterion related validity (Brown, 1983; Fraenkel and Wallen, 1983; Mehrens and Lehmann, 1984). The First distinction between them pertains to the time when the criterion data are gathered. The other is logical which is based on the purpose of testing or the inference one wishes to predict in the future.

In the case of predictive validity, for instance, the focus is how accurately criterion scores can be predicted by test scores or other measures. Whereas, in concurrent validity the interest is whether one method can be substituted for another (Brown, 1983; Mehrens and Lehmann, 1984). In fact, time interval between administering the test and obtaining the criterion measures has also been emphasized since it might affect the observed degree of relation between the two measures (Fraenked and Wallen, 1993). In the outcomes both aspects of validity investigate the accuracy of the inferences about criterion performance made from test scores or other measures.

In some situations especially in selection, according to Koul (1988), decision-making is base on an individuals expected future performance as predicted from some measures. It is also known that decisions involving selection, for example, to admit or hire an applicant or not is predictive in nature. As to Kerlinger (1992), one may predict from an independent variable. One may also predict the existence or non- existence of a relation. Such prediction is particularly needed for decision making about training institutes entrants (Ogunniyi, 1984). This is the case where predictions to the validity deals with ability to make predictions to the future performance of the applicants selected on the basis of some measuring devices.

However, there are problems in educational and psychological testing as to how to investigate the predictive validity of such selection instruments as predictors of subsequent performances when completed data are not available for those cases. In Nitko

(1983), it was shown that if all who applied to college were admitted and persisted through the first term the correlation between the admission test scores and training institute GPA might be, 0.75 or 0.80. On the other hand, if only the top scoring 30% admitted and persist, the observed correlation for this group might be only 0.50. He also indicates that most institutions have data for this type of restriction group rather than for the full applicant population. Consequently since it is the full applicant on which validity on information is needed which validity information is needed, data on the restricted group may underestimate the validity of measuring devices for selection decision (Gilbert and Cameron, 1966; Gross and Perry, 1983; Nitko, 1983).

To this end, the most commonly used measure of criterion – related validity is a validity coefficient, which is the relation between predictors and criterion scores as it was noted in Brown (1983) and Fraenkel and Wallen (1993), a validity coefficient is an index of how well criterion scores can be predicted from tests scores or other means. The squared validity coefficient indicates the proportion of shared variance or the proportion of variance in criterion scores predictable from test scores or other measures.

2.2 Finding of Studies on predictor variables

To gain from the institutions, the entering applicants must have acquired certain pre- knowledge that the training program requires. Regarding this, Schwarz (1971) has to say that “no instructional program begins at an absolute zero level of student sophistication.” According to him, one of the most straight

forward admission procedures is to measure the applicants' achievement of these entry skills and to screen the individuals who have not attained the minimum level the course of the study requires. It is meant that such devices are most useful in situation where the applicants are known to vary with respect to one or more of the necessary entry skills. He also indicated that if useful predictor can be made from data that are collected and then have no additional costs, such data have the potential of providing appreciable net gain. Hence, it is then necessary to consider first, the readily available data as predictors.

Reviews of literature; made by (Lewis, 1964; Perry and Craft, 1976) revealed that there have been extensive researches about identifying the variables, or combination of variables, that are used in predicting academic performance of training programs. Accordingly, the studies are mostly concerned with intellectual variables; which especially include high school achievement, tests as the best predictor variables.

In general, institutions usually request applicants to fill out application forms, require scores on admission test, and use other miscellaneous devices in addition.

As a results in the students file of most institution. For example, there are transcripts, admission test score and their historical information prior to their admission (Schwarz, 1971). Having this in mind, we now turn to the consideration of the predictor variables, i.e. academic performance and admission test scores that are often examined or used in educational selection.

2.2.1 Academic performance

2.2.1.1 High school Academic Scores

In practical terms, for educational selection one usually needs to have a readily available transcript of the candidate's previous work. Several investigators (Fraenkel and Wallen, 1993; Halpin and Schaer, 1981, Kebede, 1991; Meresa, 1994; Mekonnen et al, 1991, Wesely, 1994) have found the record of performance in high school to be reflected in the criterion of college performance. There are frequent cases in which high school achievement predicted freshman grades are better than scholastic achievement or aptitude tests (Halpin and Schaer, 1981). However among studies concerned with grade prediction in specific subject areas, Passons (1967) concluded that, although school achievement was the most predictive indicator of future over all college success, test scores were slightly more valid than was high school achievement for predicting grades in specific courses.

More specifically, some validity studies have focused on the predictions of nursing schools measured terms of nursing GPA and scores on state board examination from a number of nursing curriculums – related variables (Crane et al., 1987). In studies concerning the prediction of grades in nursing schools, high school achievement was found to be significantly related to first year GPA of the students in the schools of nursing. Moreover, and Oliver 1985 along with other investigators, (Alichine and Bellacci, 1986; Clemence and Brink, 1978), cited pre-nursing academic achievement as a significant predictor of academic success. In addition, Oliver (1985) found statistically significant

relationship between grades in biology and English with academic achievement in nursing programs as well as positive correlation with age. Similarly, Haney et al., (1962) have found that chemistry grades alone in high school are slightly better predictor of grades in the training courses than in the overall high school achievement.

This would not be surprising in a sense that high school performance is work sample of college performance. Regarding this, Vernon cited in Thorndike (1971) and Plapp et al, (1965) have pointed out that these measures show better correlation due to their similarity in form as well as dependence on common underlying attribute. It was further noted that these are rather based on performance over a period of time rather than on one shot evaluation

However, Schwarz (1971) pointed out that the use of school grades as index of achievement has some problems which is compounded by variations in the grading system applied by different schools and different teachers. Such difficulties have been widely recognized, and numerous adjustment techniques have been developed. One of these approached is to scale the grades given by each school in accordance with the level of future performance they actually predict, as determined through empirical studies.

Bloom and Peters (1961) cited in Thorndike (1971) applied this approach to both the predictor (High school achievement) and the criterion (freshman GPA) so as to correct for variation in the grading standards of both types of institutions; and they also reported substantial gains in the accuracy of prediction. However

Lindquist (1963) repeated this study with a larger and more representative sample and concluded that the very slight gains obtained do not justify the computational labor involved. His suggestion was to use grades as they are as one of the component of a multiple predictor and to account on the other instruments to compensate for the unfairness which uncorrelated grades may introduce. It should be noted that both of these studies Lindquist (1963) were carried out on students in reasonably homogeneous high schools of the United States, unlike that quite different result might be expected in countries in which there are considerably larger inter-school variations.

Accordingly, the simplest of other approaches and which also reduces variations is to use the applicant's rank in his/her graduating class rather than an index based on his/her grades directly (Schwarz, 1971). Thus, in most studies (Fantu et al, 1996, Brown, 1983) rank in class is found to yield consistently better results in predicting academic success of students in future work. In an attempt to demonstrate the need for more effective indices for training success, several investigators (Dittmar, 1977, Goldman and Widawski, 1976; Houston 1980, Slack and Porter, 1980) have pointed out the limitation of the college Board Scholastic Aptitude Test (SAT) and superiority of High School Rank (HSP) over both the math's and verbal sub-test scores of SAT. The study conducted by Fantu et al (1996) also revealed that the twelfth grade class rank significantly predicted first semester freshman GPA. In addition, among seven predictors used in college of engineering HSR was the one having the highest correlation with the criterion (Brown,

1983). Some researcher (Lewis and Welch, 1975, Plapp et al, 1965) also applied rank to nursing schools and found that in graduating class it yielded a statistically significant relationship with a criterion of achievement in the program. Consequently in the review made by Bressel (1977) the correlation of HSR with first term grades in training program generally ranges from 0.40 to 0.55.

Since high schools frequently rate their students in terms of their rank in class and also schools vary so much in enrolment, then these rankings are of limited value Hence, translating these rankings into percentile rank is a useful method of giving a more meaningful inter predation. The study conducted by Aleamoni and Oboler, 1977, cited in Nitko (1983) used high school percentile rank (HSPR). In this study, the correlation between percentile rank in high school graduating class and first semester college GPA was found to be 0.84. Likewise, Plapp, et al. (1965) also found similar results in nursing school. Thus, from the fore going research findings and discussions, one would predict that an applicant who has a higher school rank will likely have better grade in the training institutions.

2.2.1.2 The Ethiopian School Leaving certificate Examination (ESLCE)

It is not time more about ESLCE since it has been ceased to be administered beginning from 2003. However, applicant of Health Science College student's can summit their ESLCE GPA optionally to that EHEECE GPA. This is because most students have attended their high school education prior to the implementation

of currently used EGELCE/EHEECE GPA as one of selection criteria in health Science College. Therefore, a short ESLCE validity seems appropriate for the complete understanding of the predictor variables in this study.

Many studies have been conducted to examine whether the ESLCE GPA predicts students performance in colleges universities and other institutes. However many of the results are not consistent. Tracy (1965) examined the validity of ESLCE in several facilities. He found a significant relation between the overall ESLCE GPA and first year cumulative GPA but the correlation was lower for each subject grade of ESLCE and concluded that ESLCE GPA predicted moderately with differential prediction among colleges and facilities.

Similarly, Desta Berhe (2002) made a study on the validity of the selection criteria for recruiting trainees to Abbiyi Addi College of teacher's education. This study included 314 trainees who sat for the first semester college examination in the 1999/2000 academic years. The selection criteria, TTI GPA, ESLCE GPA, academic rank in career structure, work performance evaluation score and entrance examination score were taken as predictive variables while college semester grade point average of the first semester of the trainees considered as criterion variables, using statistical devices such as Pearson correlation, simple and multiple regression analysis and analysis of variance (ANOVA), he concluded the TTI GPA, ESLCE GPA and entrance exam scores found to be the best criteria for selection purpose, Mohammed Alewi (2004) has also indicated that ESLCE GPA together with other predictive variables was found to be best

predictor of success in the Kiremt program of the Awassa College of Teachers Education.

On the other hand, researchers forwarded their argument in opposing the above findings. Merhatibeb (1993), in his study of the relationship between ESLCE scores and students academic achievement at Bahir Dar Teachers Collage, reported that they have weak correlation. Hence, he concluded the ESLCE as a whole lack adequate validity to warrant validity as the sole instrument of selection and admission of students to higher education. There are other researchers, who indicated that ESLCE scores were not valid indicators of student success at higher institutions. For example, Mittman (1972) analyzed three variables (Amharic, English and Mathematics ESLCE scores for the variation they contributed to first year University GPA of freshman students. The result neither showed that the three variables did nor show significant contribution for variation in first year GPA. Kebede (1991) found that neither totals ESLCE GPA not ESLCE mathematics results significantly contributed to predicting college performance. In a similar study by Meresa (1994) the concluded that ESLCE GPA did not predict first semester ESLCE GPA was not statistically significant with first year composite score Fantu et al (1996) similarly concluded that ESLCE GPA did not predict first semester freshman GPA freshman GPA. Lakew (1972) concluded that the ESLCE Amharic GPA was too low to predict the student's college performance.

Belay (1991) did also conclude that ESLCE GPA was not a potential predictor of trainee's GPA of vocational and professional courses at teacher training institute by Tamiru (1992) the ESLCE

GPA was not found as valid predictor for Departments other than the Department of front office. In general, from the very brief research findings dealing with the ESLCE, some correlation coefficients found were significant and moderate. These may indicate that the part played by ESLCE GPA in predicting the success of students in the higher institutions was not negligible. It can also be noticed that some of the studies reported considered the ESLCE as weak predictor of college performance.

The main points raised about ESLCE are not because of the fact that ESLCE is functioning today. It is aimed at showing how the existing nationally standardized achievement test was continuously declining in validity with passage of time, and that test developers and policy makers should give attention for the new standard achievement test that is being administered at grade ten.

2.2.2 Admission Test Scores

Evidence in defense of ability tests in college admissions come largely from validity studies of such test in predicting educational attainment, especially the academic performance of student in institutions of higher learning. Austin and Garber (1982) pointed out that admissions tests have predictive power in college independent of one's high school grades, partly because grades depend considerably on the academic and competitive environment of a particular high school student attended.

Beside to this, records of previous academic performance are data readily available for academic selection. However, additional data such as scores on admission tests have often been found to

be useful for academic selection. It had been indicated by Hills (1971) that the most commonly used admission tests are achievement and aptitude tests which are often thought to have potential contribution to the prediction of college academic performance. It should also be noted that there is no a very clear distinction between aptitude and achievement in educational testing. According to Hills a matter more completely than is the aptitude test.

But, verbal and mathematical aptitude tests are correlated with each corresponding achievement tests at the level of 0.60 or higher when this is the case, it probably would be difficult even for a measurement or subject – matter expert to sort into separate groups accurately the items from aptitude and achievement tests.

Achievement and aptitude tests can also be distinguished according to the types of predictions for which each is most useful (Gronlund, 1985). Because past achievement is frequently the best predictor of future achievement, both types of achievement tests are then useful in predicting future learning. The content – oriented achievement tests can predict how well a pupil will learn new knowledge in the same content area, but it is less valid in predicting future learning in other areas. On the other hand, test measuring general educational development are more effective predictors of future achievement than are content oriented test (Gronlund, 1985). This suggests that test of educational development have been shown as good predictors of general school achievement as aptitude tests.

However, some author (Brown; 1983, Mehrens and Lehmann, 1972) argue that certain achievement tests may be better predictors than particular aptitude test for some specified purpose. They also pointed out that there are many instances where achievement test are used primarily to predict future performance since past performance is frequently the best predictor of future performance. In that case a training institute may select its entrance on the basis of an achievement test if the test has been found to be a valid predictor. On the other hand, Helmick and Jameson (1977) argued that a combination of aptitude and achievement testing almost always provides a better basis for predicting academic performance than does either type of testing separately.

It appears reasonable that admission test scores are more significant and important in predicting training performance. According to Lewis (1964) admission test scores yield significant regression weights and was also the only pre- training variable to yield a significant regression weight for predicting training performance. Sechrest (1963) also found the highest correlation between cooperative General Science Test and the GPA in nursing schools.

In Ethiopia, Some researchers (e.g, Fantu et al 1996; Kebede, 1991; Meresa, 1994, Mittman, 1972; Mekonnen et al., 1991; Tamiru, 1992) have attempted to assess the effect of admission test scores (the incremental validity of the admission test scores) in selection of students for higher learning institutions. Some of these found admission test scores to be strongly predicting students' future performance in training institutions

for instance; Kebede (1991) found the Differential Ability Test (DAT) total and its sub scores significantly predicted students' academic performance in college. However, the predictive ability of the DAT test scores by Meresa (1994) revealed that the aptitude test has statistically significant relationship with most of the criterion measure. For example, the mathematics and physics entrance examination had statistically significant relationship with the first year composite scores, but English entrance did not predict first year composite scores. Tamiru (1992) also found that score of entrance examination was valid predictor only for food and Beverages services and food and Beverage control Department. In addition to another study (Fantu et al, 1996) DAT – numerical and DAT verbal reasoning were found to be significant predictor of first semester freshman GPA – Spatial Reasoning. To sum up, when one desires to predict a criterion type of behavior, it would be very convenient to use an appropriate admission test and then make decisions accordingly.

2.2.3 Combination of variables in predicting

Academic success

Often times several variables rather than a single variable are investigated as possible predictors of a criterion. The aim then becomes that of selecting those predictor variables which in combination could give most reliable predictions and finding the most effective way of using the combined information. For example, admission officers of training institutes consider student's high school achievement, achievement tests and other data (Brown, 1983). In such cases; the important question is

how to combine scores on these variables so as to obtain the most reliable prediction. In terms of validation the question is then how to determine the validity of the composite scores.

The most frequently used approach to the combination of such measures for prediction of a continuous criterion is that of multiple linear regressions (Brown, 1983; Fraenkel and Wallen, 1993, Kerlinger, 1992).

Eventhough many predictor variables may be found to be predictive of the criterion, it has been observed that combining these variables usually yield relatively little gain in prediction over that obtain by using the best two or three (Alemoni and Oboler, 1977 cited in Nitko, 1983; Brown, 1983). Thus, an additional measure has value only to the extent that it adds validity beyond that provide by the initial predictors, and each additional measures would be evaluated by its ability to improve upon the existing variable (Sechrest, 1963).

2.3 Selection of Applicants for higher education

There are two forms of access to higher educations one is referred to as open admission which allows any student who has completed secondary school to attend course work at a higher level; and the other is selective admission (Jameson and Ottobre, 1976; Hills 1971.) However, there have been arguments indicating that the system of open admissions to higher education for all qualified high school leavers seems problematic (Smith cited in Thorndike, 1971, Teichler, 1991). This is because when access to higher education from secondary education is widened, and when capacities in some field of study are not also

extended in accordance with the growing number of applicant do not exceed the number of places available, all qualified could be admitted. However, this does not mean that such institutions are required to retain those applicants once they are admitted. Because the attrition rate in colleges and universities that practice open admission in many cases is quite high, with the first year in particular.

There are other institutions that carefully choose students in the selection process in order to be sure that their product would display refined qualities (Biraimah, 1991; Jameson and Ottobre, 1976, Hills, 1971 Teichler, 1991) for instance, all institutions in the United States require a minimum secondary school graduation with a passing average. But it was indicated that many selected institutions required the student to be in the upper half of his/her secondary school class. Besides this selective institutions also required students to submit entrance examination results of aptitude and/ or achievement test (Jameson and Ottobre, 1976).

Likewise, nursing schools like some of the higher institutions in different counties require students to have class rank in his/her graduating class and entrance examination results (Grippando, 1986, Waston, 1976). However, Crane et al, (1987) claim that the problem nursing schools is the identification of predictor variables which would facilitate the selection of candidates. In fact, some authors of rejecting students who would actually succeed and accept students who would fail. Moreover, some students in some institutions may fail although they may excel

other students elsewhere (Gottheil and Michael, 1957 Oliver, 1985).

In the Ethiopian case the admission requirement to higher learning institution is the ESLCE. The certificate of completion is awarded to those who have successfully completed the secondary education cycle and pass an examination which is administered nationwide by the Ministry of education currently through the organization for National Examinations, Nevertheless the ESLCE ceased to serve as college entrance examination; instead other instrument of selection were devised. As the result of the implementation of the new educational and Training policy; college entrance exam and other examinations have been devised to serve as selecting instrument for admission into higher educational institutes of the admission into higher educational institutes of the country. These are the Ethiopian General Secondary Education Certificate Examination (EGSECE) and the Ethiopian Higher Education Entrance Examination (EHEECE). The first one is used to select student TVET and preparatory classes. However, different governmental and other training institutions in the country have been using other alternative measures besides the EGSECE for admitting applicants.

CHAPTER THREE

3 Methodology

In this section of the paper, subjects variables included in the study, procedures of data collection and analysis are discussed in this order.

3.1 Subjects

The subjects for this study consist of 306 trainees who are admitted to the Awasa Health Science College (AHSC) for the regular program in 2004 and graduated in 2006 after attending for three years. Graduation approval is assured when each candidate has completed the total credit hours (varying from 65-71 according to the department of enrollment) allotted and scored a minimum cumulative GPA of 50%. Since success in the program was defined as graduating just after attending three years regular program, those trainees who withdrew, or dismissed are not taken as subjects of the study. This is because of the fact that, graduation GPA as a criterion measure is more reliable than other GPA obtained through the course of the study. However, if there is high attrition rate, taking graduation GPA as a criterion measure may cause sampling bias. Particularly, when number of participants dismissed due to academic failure is high. As referred to some documents of the college most of the candidates who have poor performance were given promotion instead of dismissal. Moreover, withdrawal due to family problem and delaying due to the limited number of courses that a trainee needed to take according to his learning pace are the major causes for attrition. For instance, the total number of trainees

number of trainees admitted to AHSC in 2004 is 306. Out of these, 22 are dismissed, 3 of them dropped out and 281 of them were able to graduate in 2006. These 281 graduates are the subjects of the study.

AHSC started the regular program for Diploma Level into 2004 in different field of study but, in earlier years it trained only nurse students. The trainees admitted to AHSC in 2004, are the only candidates whose data on both criterion and predictor variables are available in the registrar's office of the college. The 2004 batch is the source of data as they are the convenient sample for the study.

Table 1 Number of subjects for the study

Department				Dismissal		
Field of study	M	F	T	M	F	T
Clinical nurse	102	40	142	1	14	15
Pharmacy	35	11	46	4	1	5
Laboratory Technician	39	8	47	3	2	5
Mid wife	-	46	46	-	-	-
Total	176	105	281	8	17	25

3.2 Variables Included in the Study

3.2.1 Independent (predictor) Variables

The selection criteria used for Awasa Health Science College of SNNPR, i.e., entrance examination scores and ESLCE/EHEECE, GPA were considered as predictor variables. In addition, trainee's high school average scores were used as other predictor variables. This is on the basis of the assumption that the addition

of some variables would improve the prediction of academic performance of trainees used with other variables. The pertinent literature reviewed also indicates that high school average scores and class rank have been used in academic selection in different training institutes (Lewis, 1964; Loeb and Mueller, 1970, Mclaughlin, 1971).

3.2.2 Dependent (Criterion) Variables

The dependent variable in this study was the academic achievements of the trainees in the Health Science College. Hence, the dependent variable was average score earned by each trainee during first, second and third year training program.

3.3 Procedure of Data Collection

Each subject's scores in both the selection criteria and college performance (predictors and criterion measures respectively) are collected from personal and other files kept at AHSC. Scores in the selection criteria such as sex, ESLCE or EHEECE GPA, high school average scores and entrance examination are collected from the document containing results from each zone or special worda of the SNNPR to the college. Then personal file of each trainee was checked in order to collect data on criterion variable (college of Graduation GPA) with special consideration whether there is graduation approval, dismissal or withdrawal cases in each file.

3.4 Data Analysis

The means and standard deviations were determined at the beginning to show the general characteristic of the data. Then, the inter predictor and the predictor-criterion variable correlation

matrices were computed for sub-groups separately in order to pave the way for further analyses by indicating the predictability of each predictor variable. Then to know the exact amount of variance accounted for by the independent variables to the total variance in the dependent variable (academic achievement) coefficients of determination were obtained through multiple regression.

Finally, to find the relative contribution of each independent variable to the total variables, in the dependent variable while controlling the effects of other independent variables, stepwise regression was also computed.

An F test of significance of the correlation coefficients in each model and the incremental validity of predictor variables included in the model is made at the final step using on alpha level. If the contribution of the selected predictor variable is not significant, the best prediction model is established based on the significant contributor variable only.

To this end, the analyses were done for each academic year in spite of analyzing predictor variables (i.e., entrance examination and ESLCE or EHEECE scores) of three years in combination.

Table2 Mean and standard Deviation

Variables	Clinical Nursing		Pharmacy		Laboratory Technical		Midwife	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
X₁	31.4155	6.76426	34.2826	6.87318	35.0213	5.29249	35.6630	6.11106
X₂	29.5734	5.87224	63.0174	6.75070	71.7106	7.52562	2.7522	0.38915
X₃	71.6071	9.54675	71.5609	11.52529	72.9323	9.84520	69.3063	9.66908
Y₁	76.0758	7.80695	72.4650	10.872	75.9309	7.98627	76.2987	8.58327
Y₂	74.8321	7.88395	78.9800	8.41722	75.4100	6.85138	76.76501	6.77832
Y₃	80.297	5.97605	83.0852	6.6506	79.5415	6.43630	77.3798	6.6435

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4.1 Results

Under this part of the paper, the results obtained from the simple descriptive statistical methods, results of correlation analysis and results of regression analysis are presented.

4.1.1 Descriptive Statistical Result

To show the general feature of each predictor and criterion variables descriptive statistics such as the mean and standard deviation are used. The results are presented in Table 2.

As can be seen from the table, number of subjects in four fields of study varied from 46 to 142. The mean entrance examination (X_1) in the field of study varied from 31.4155 to 35.6630, where the least is in clinical Nursing and the highest is in Midwife fields of study. The mean ESLCE/EHEECE (X_2) varied from 29.5734 to 71.7106 where the least is in clinical nursing and the highest is in laboratory. But, the mean of ESLCE is observed in midwife is 2.7522. The mean high school average score (X_3) varied from 69.3063 to 72.9323 where the least is in midwife and the highest is in laboratory.

The mean of year one (Y_1) college GPA Varied from 72.4650 to 76.2907, where the least is in pharmacy and the highest is in midwife. The mean of year two (Y_2) college GPA varies from 74.8321 to 78, 9850 where the least is in clinical Nursing and the highest is in pharmacy. The mean of year three (Y_3) college GPA Varies from 77.3798 to 80.2971. Where the least is in midwife

and highest is in pharmacy. However, one can see that the means of the other variables seem to differ in size from the means of the variables mentioned above. These happen because of the nature of scores of these variables.

According to the selection requirements, the number of female trainees expected to be twice of male trainee. There is, however, no obvious reason to be stated have why this is completely reversed in its implementation. In fact, one may argue that either few numbers of female applications applies for admission or most of them failed to fulfill the requirements might be the reason for this rate. The standard deviation of the criterion variables range 5 to 10. In addition, values of this standard deviation indicate that the scores of criterion variables are somewhat clustered closely around in their means than most predictor variables. In general, the distribution indicates that most variables tend to have relative spread when comparisons are made among variables in terms of their respective standard deviations.

4.1.2 Results of correlation Analysis

Once correlation coefficient has been computed between predictor and criterion variables, there are remaining the questions of interpretation. In interpreting the relationship between these variables, some researchers (e.g. Cohen and Manion, 1994: 137, Frankel and Wallen, 1993: 296) have approached it in three ways. These are examining the strength of the relationship, the statistical significance of the relationship, and the square of the correlation coefficient. These are generally

intended to answer some basic questions about two variables. Is there a relationship between two variables? If there is a relationship, then what is the direction of the relationship? And what is the magnitude? These approaches are used to interpret the correlation coefficients computed so far. Table 3 through 6 shows the relationships between predictor and criterion variables.

Table 3 Intercorrelation Matrix of the predictor and criterion variables in the Clinical Nursing field of study (N=142)

Variable	X ₁	X ₂	X ₃	X ₄	Y ₁	Y ₂	Y ₃
X ₁	1						
X ₂	-0.342**	1					
X ₃	0.357**	-0.131	1				
X ₄	0.017	-0.184*	-0.033	1			
Y ₁	0.392**	-0.007	0.656**	-0.041	1		
Y ₂	0.579**	-0.423**	0.632**	-0.006	0.750**	1	
Y ₃	0.484**	-0.119	0.685**	-0.047	0.845**	0.869**	1

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

As can be seen clearly from table 3 above two of the predictor variables in clinical nursing field of study have statistically significant positive relationship with trainees first year academic achievement (Y₁), for example, high school average scores X₃ has strong correlation with criterion variable (r=0.656). Slightly lower, but still sizable correlation with this criterion exist for entrance examination (X₁)(r=0.392). The high school average score and entrance examination score have statistically significant at the 0.01 level. Whereas, sex (X₄) and

lower, but still sizable correlation with this criterion exist for entrance examination (X_1) ($r=0.392$). The high school average score and entrance examination score have statistically significant at the 0.01 level. Whereas, sex (x_4) and ESLCE/EHEECE (x_2) results of trainees' at selection do not show statistically significant relationship with this criterion variable.

In the second year academic score (Y_2) all of the predictor variables have statistically significant with positive and negative relationships for instance, entrance examination (X_1) and high school average score have positive strong correlation with Criterion variable (Y_2) ($r=0.579$ and 0.632) respectively. While ESLCE/EHEECE (X_2) has negative correlation with Criterion variable (Y_2) ($r=0.423$). These are all statistically significant at the 0.01 level. But sex (X_4) is not statistically significant.

As can be seen from same table above, two of predictors variables have statistically significant relationship with the third year academic score (Y_3). Among the variables high school average score and entrance examination (X_1) have strong relation with the criterion which are significant at the 0.01 level. However, ESLCE/EHEECE scores and sex (X_4) are not statically significance relationship.

In general, we can also see from Table 3 that X_3 is significantly related with X_1 and X_2 where the latter two are also significantly correlated with each other. This may happen in the course of model building that the contributions of some variables are taken over by already selected variables for each criterion measure.

Table 4 Intercorrelation Matrix of the predictor and criterion variables in pharmacy field of study

Variable	X ₁	X ₂	X ₃	X ₄	Y ₁	Y ₂	Y ₃
X ₁	1						
X ₂	-0.497**	1					
X ₃	0.829**	-0.533**	1				
X ₄	0.434**	-0.310*	0.294*	1			
Y ₁	0.775**	-0.559**	0.776**	0.372*	1		
Y ₂	0.733**	-0.523**	0.705**	0.328*	0.944**	1	
Y ₃	0.725**	-0.538**	0.755**	0.374*	0.936**	0.907**	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

As can be seen from table 4 above almost all of predictor variables in the pharmacy field of study have statistically significant positive and negative relationship with trainees first year academic achievement (Y₁), For example entrance examination (X₁) and high school average score (X₃) have strong correlation with criterion variable (r=0.775 and 0.776), respectively. But the ESLCE/EHEECE (X₂) has negative relationship and strong correlation with criterion variable (Y₁) (r=-0.559). Slightly lower, but still sizable correlation with this criterion exist for sex (X₄) (r=0.322). These are all statistically significant at the 0.01 level. Whereas, sex (X₄) is at the 0.05 level. The positive relationship between sex (X₄) and first year academic performance reveals that male trainees perform better than females.

In the second year academic score (Y₂) is the same with the first year that is two the predictor variable entrance examination and high school average scores have strong correlations and positive

relationship with criterion variable (Y_2). On the other hand, ESLCE /EHEECE(X_2) is negatively and moderately correlated with this variable ($r=0.538$) and sex (X_4) with in the same criterion has positive but lower correlation with (Y_2) ($r=0.320$) the significant of all predictor variables are the same with (Y_1). That is the three predictors X_1 , X_2 and X_3 are significant at 0.01 levels. But, X_4 is at 0.05 levels.

The same with the above two criterion variable, almost all predictor variables are statically significant with negative and positive relationship with three years academic performance score. In addition, the predictor variable X_1 , X_2 and X_3 are significant at 0.01 levels; where as, X_4 is significant at 0.05 level.

Table 5 Intercorrelation Matrix of the predictor and criterion variables in Laboratory field of study

Variable	X_1	X_2	X_3	X_4	Y_1	Y_2	Y_3
X_1	1						
X_2	0.121	1					
X_3	0.324*	0.066	1				
X_4	0.090	-0.240	-0.139	1			
Y_1	0.686**	0.205	0.581**	-0.012	1		
Y_2	0.699**	0.093	0.636**	0.027	0.947**	1	
Y_3	0.735**	0.056	0.671**	-0.040	0.860**	0.893**	1

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

As can be seen from the table 5 above, except ESLCE/EHEECE which is not statistically significant with all criterion variables. Other enters predictor such as entrance examinations and high school average show strong correlation coefficients. The entrance

examination (X_1) is strongly correlated with first year academic performance ($r=0.689$) and the same with the two academic years ($r=0.699$ and 0.735), respectively. More over, high school average score is strongly correlated with year one, year two and year three academic performance ($r=0.581$, 0.636 and 0.671) respectively. Both predictors i.e. X_1 and X_3 are significant at the 0.01 level. Where as, the remaining predictor variables sex and ESLCE/EHEECE(X_2) have positive relationship with all criterion variables, they are not statistically significant. This is to suggest that those trainees who scored high in entrance examination and high school average score tend to achieve high academic performance in training institutes and vice versa.

Table 6 Intercorrelation Matrix of the predictor and criterion variables in Midwife field of study.

Variable	X_1	X_2	X_3	Y_1	Y_2	Y_3
X_1	1					
X_2	0.080	1				
X_3	-0.009	0.493*	1			
Y_1	-0.175	0.263	0.528**	1		
Y_2	-0.221	0.202	0.556**	0.860**	1	
Y_3	-0.184	0.227	0.429**	0.751**	0.809**	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

As can be seen from table 6 one predictor variable like high school average school has statistically significant positive relationship with each of criterion variable in the midwife field of study. For example, high school average score has the highest correlation among the other predictor variables throughout the

training program($r=0.528, 0.556$ and 0.429), respectively. It is also significant at 0.01 levels.

Even though ESLCE GPA has positive relationship with all criterion variables, it is not statistically significant with all criterion variables. In addition, entrance examination results has negative relationship throughout training program and it is not significant in prediction .This is to suggest that those trainers who scored high in entrance examination tend to achieve low academic performance in training collages and vice versa.

4.1.3 Results of Regression Analysis

In order to evaluate the gross contribution of all predictor variables, all are employed in a linear combination for prediction of each criterion variable, there, after, the stepwise regression analysis has been done to assess the relative contribution of predictor variables in predicting each criterion measures in each academic year. Hence, in this part of the paper, the first two predictor variables (i.e., X_1 and X_2), were assessed accordingly. Moreover, when predictor variables (i.e., X_3 and X_4) were added to the initial predictors, the same techniques were also employed in founding potential predictors and overall contribution as well. The results of the analysis are summarized in table 7 to 10 below.

Table 7 Summary of regression analysis of Y_1 to Y_3 in the field of clinical nursing (N=142)

Variables	Multiple Correlation			F- Value	Simple Corr.	Dep. Var.
	R	R ²	change in R ²			
X_1 & X_2	0.415	0.172	-	14.462	-	Y_1
X_1	0.392	0.154	0.154	25.473	-0.392	
X_1 to X_4	0.692	0.479	-	31.502	-	
X_3	0.656	0.431	0.431	105.830	0.656	
X_1	0.678	0.459	0.028	59.026	0.392	
X_2	0.692	0.479	0.020	42.308	-0.007	
X_1 & X_2	0.627	0.393	-	44.955	-	Y_2
X_1	0.579	0.335	0.335	70.626	0.579	
X_2	0.627	0.393	0.058	44.955	-0.423	
X_1 to X_4	0.774	0.600	-	51.329	-	
X_3	0.632	0.399	0.399	93.055	0.632	
X_1	0.737	0.543	0.144	82.468	0.579	
X_2	0.773	0.598	0.045	68.416	-0.423	Y_3
X_1 & X_2	0.486	0.236	-	21.503	-	
X_1	0.484	0.234	0.234	42.721	0.484	
X_1 to X_4	0.734	0.539	-	40.018	-	
X_3	0.685	0.470	0.470	124.033	0.685	
X_1	0.732	0.535	0.065	80.057	0.484	

As it can be seen in table7 above, the proportion of explained variance in Y_1 , Y_2 and Y_3 accounted for by the linear combination of two predictor variable (i.e. X_1 and X_2) are 17%, 39% and 24%, respectively. The F-values indicate that the contribution of predictors are statistically significant in all criterion mentioned earlier. This shows that both variable success to explain all the

respective criterion variables. The addition of two predictor variables (i.e. X_3 and X_4) to initial variables, explained about 48%, 54% and 60% respectively. In the same table, the F-value revealed that the overall contribution of X_1 through X_4 in Y_1 , Y_2 and Y_3 is statistically significant at the 0.01 level. Besides this, results of stepwise regression analysis on Y_1 show that almost all predictor variables were selected by the regression model. Thus they explain about 43%, 3% and 2% of the variance in Y_1 , respectively. Similarly, almost all predictor variables were selected by the regression model in Y_2 . These explain about 40%, 54% and 60% of the variance in Y_2 , respectively. Whereas, only two predictor variables such as X_3 and X_1 are selected by the regression model. Thus, they explain about 47% and 54% of the criterion variables in the Y_3 . On the other hand, both variables (the first two) jointly contribute about 17%, 40% and 23% to explained variable in Y_1 , Y_2 and Y_3 , respectively.

The F-value also indicates that the contribution of those variables (i.e. X_1 through X_4) in combination is statistically significant at 0.05 levels in all criteria, variables. This holds true again for the joint contribution of X_1 and X_2 in predicting all criteria. Results of stepwise regression also revealed that X_1 was selected between X_1 and X_2 to predict trainee's performance in both criterion measure of Y_1 and Y_3 . So X_1 explains alone about 15% and 23% of the explained variance in Y_1 and Y_2 , respectively. This may assure the negligible contribution of X_2 in predicting Y_1 and Y_3 . Similarly, among predictor variable used in this study X_3 was selected at the first model, because of this variable has the highest correlation with the respective criterion variables. Hence, it appeared as the only potential predictor variable when the four

predictor variables used in combination. Thus, this variable explains about 43% 40% and 37% in the three cases.

Table 8 Summary of regression analysis of Y_1 to Y_3 in Pharmacy field of study (N=46)

variable	Multiple Correlation			F. Value	Simple Corr.	Dep. Var.
	R	R ²	Change In R ²			
X_1 & X_2	0.801	0.641	-	38.429	-	Y_1
X_1	0.775	0.601	0.601	66.344	0.775	
X_2	0.801	0.641	0.040	38.429	-0.559	
X_1 to X_4	0.825	0.681	-	21.924	-	
X_3	0.776	0.602	0.602	66.671	0.776	
X_1	0.811	0.658	0.056	41.368	0.775	
X_1 & X_2	0.756	0.571	-	28.629	-	Y_2
X_1	0.733	0.538	0.538	51.195	0.733	
X_1 to X_4	0.767	0.588	-	14.651	-	
X_1	0.733	0.538	0.538	51.195	0.733	Y_3
X_1 & X_2	0.754	0.568	-	28.264	-	
X_1	0.725	0.526	0.526	48.795	0.725	
X_2	0.754	0.568	0.042	28.264	-0.538	
X_1 to X_4	0.790	0.624	-	17.020	-	
X_3	0.755	0.570	0.570	58.398	0.755	

As can be seen from the table, the proportion of the explained variance in Y_1 and Y_3 also accounted for by the linear combination of the initial variables (i.e. X_1 and X_2) are 64% and 57%, respectively. In addition Y_2 also explained variance of linear combination of the initial variable is 57% when other two variables are used along with those variables the prediction accuracy was improved from 64% to 68%, from 57% to 59% and from 57% to 62% in each criterion variable, respectively. Hence, there is a gain of 2%, 4% and 5% in prediction in all

Hence, there is a gain of 2%, 4% and 5% in prediction in all cases. The F-value of the multiple regression show that all predictor variables in all combination make statistically significant contribution at the 0.05 level. In all cases between X_1 and X_2 the variable that is entered to the regression model is X_1 in the criterion variable Y_2 but both X_1 and X_2 are models in Y_1 and Y_3 . It then accounts for about 54% of variance in Y_2 . However, it accounts for about 60% and 64% and 52% and 57% of variance in Y_1 and Y_3 respectively. Moreover, two predictor variables entered into the regression model among the other variables in predicting those criterion variables in predicting Y_1 , for example, the variable that is entered into the model is X_3 since it has the highest correlation with criterion (Y_1). This variable alone improved the accuracy of prediction in Y_1 by 60%, The predictor variable which entered in the second step is X_1 and then added about 6% of the explained variance in Y_1 , In the same way, X_3 and X_1 were also entered into the model in the first place in predicting Y_2 and Y_3 . Hence x_3 and X_1 accounts for about 60% of the variance in Y_1 when X_1 entered in the next step, the prediction of the criterion variable is thus improved by 66%.

In general, we can also see from Table 4 that X_3 is significantly related with X_2 and X_1 where the latter two are also significantly correlated with each other, And X_3 is also significantly related with each other And X_3 is also significantly related with X_2 This may happen in the course of model building that the contribution of some variables are taken over by already selected variables for each criterion measure.

Table 9 Summary of regression analysis of Y_1 to Y_3 in Laboratory field of study (N=47)

variable	Multiple Correlation			F. Value	Simple Corr.	Dep. Var.
	R	R ²	Change In R ²			
X_1 & X_2	0.697	0.486	-	20.823	-	Y_1
X_1	0.686	0.471	0.471	39.986	0.686	
X_2	0.792	0.628	0.157	17.714	-	
X_1 to X_4	0.686	0.471	-	39.986	0.686	
X_3	0.784	0.615	0.615	35.104	0.581	
X_1	0.700	0.489	0.144	21.088	-	Y_2
X_1 & X_2	0.699	0.489	-	43.109	0.699	
X_1	0.823	0.678	0.678	22.123	-	
X_1 to X_4	0.699	0.489	-	52.946	0.699	
X_1	0.822	0.676	0.676	66.050	0.636	
X_1 & X_2	0.736	0.541	-	25.982	-	Y_3
X_1	0.735	0.541	0.541	52.946	0.735	
X_2	0.868	0.754	0.213	32.141	-	
X_1 to X_4	0.735	0.541	-	52.946	0.735	
X_3	0.866	0.750	0.750	66.050	0.671	

Results of multiple regression analysis in Table9 above indicate that the combined effect of X_1 and X_2 statistically significant through out criterion variables The explained variance in each criterion measure are both X_1 and X_2 are 49% and X_3 is 54% account for by two predictor variables. This is meant that these variables which are now found to be substantial were used in screening applicant for training institutions.

Moreover, the explained variance of each of the criterion variables is also improved when those additional variables computed together with initial variables. The prediction of each criterion variable is now better improved by about 63%, 68%

criterion variable is now better improved by about 63%, 68% and 75% of variance in Y_1 to Y_3 , respectively. Hence the gross contributions of those variables in combination are then statistically significant at the 0.001 level in all criterion variables. In addition, among the variables, only X_1 and X_3 are selected as potential variables in predicting criterion measures in the same order, in predicting Y_1 , for example, X_1 first entered in to the regression model and account for about 47% when X_3 entered in the next step, the prediction of Y_1 is improved by 14%. Similarly these variables are also selected by the model in predicting Y_2 and Y_3 in the same order. Moreover, some predictor variables are deleted from the mode since they could not add a significant contribution to the explained variance of each criterion variable. However, since X_1 and X_3 have significant relation ships with X_4 and X_3 is also with X_2 , the contribution of the remaining variables towards the prediction might be suppressed by their influence.

Table 10 Summary of regression analysis of Y_1 to Y_3 in midwife field of study (N=46)

Variable	Multiple Correlation			F. Value	Simple Corr.	Dep. Var.
	R	R ²	Change In R ²			
X_1 & X_2	0.328	0.108	-	2.977	-	Y_1
X_1 to X_3	0.579	0.336	-	3.838	-	
X_3	0.528	0.279	0.279	16.241	0.528	
X_1 & X_2	0.314	0.096	-	2.1839	-	Y_2
X_1 to X_3	0.639	0.409	-	5.124	-	
X_3	0.556	0.309	0.309	18.366	0.556	
X_1 & X_2	0.306	0.094	-	2.072	-	Y_3
X_1 to X_3	0.542	0.294	-	3.095	-	
X_3	0.429	0.184	0.184	9.249	0.429	

As can be seen in table 10 above, regression analysis on each criterion variable indicates that contribution of X_1 and X_2 together are not statistically significant with all criterion variables. None of them is also entered into the regression model. This may happened as a result of having petty correlation with each criterion variable. The extent to which these variables explain each dependent variable is almost negligible. In predicting Y_1 , Y_2 and Y_3 , for instance, they account for 11% and 10% of the explained variance in the respective criterion variable. The proportion of variance in each dependent variable by its relationship with predictor variables might be increased in some amount when one additional variable included in the regression model. In all cases, the overall contributions of those variables

are found to be statistically significant at the 0.05 level. That variable is improved about 23%, 20% and 31% of that the variance in each of the criterion variables, respectively.

However, among the variables used in the study X_3 as a potential variable entered into the regression model in all criterion variables from Y_1 through Y_3 . This variable then explains about 28% in Y_1 , 31% in Y_2 and 18% in Y_3 . It can be seen from table 10 the significant correlation of X_2 and X_3 with selected predictor variable X_3 is likely to take a reasonable share of prediction which other wise would have been made by other variables.

Table 11 summary of the stepwise regression analyses Indicating potential predictor variables.

Field of study	Criterion Variables		
	Y_1	Y_2	Y_3
Clinical nurse	$X_3^{***}, X_1^{***}, X_2^{***}$	$X_3^{***}, X_1^{***}, X_2^{***}$	X_3^{***}, X_1^{***}
Pharmacy	X_3^{***}, X_1^{***}	X_1^{***}	X_3^{***}
Lab, Tech	$X_3^{***}, X_1^{***},$	X_3^{***}, X_1^{***}	X_3^{***}, X_1^{***}
Mid wife	X_3^{**}	X_3^{**}	X_3^{**}

* $P < 0.05$, ** $P < 0.01$ *** $P < 0.001$

The summary of regression analysis from table 7 to 10 indicate that the combined effect of entrance examination results is significant in predicting criterion variables from Y_1 to Y_3 in almost the three fields of study. But, ESLCE or EHEECE is also significant in predicting criterion variables in clinical nursing and pharmacy

fields of study. None of these is, of course, significant as indicated in table 8 in particular.

The addition of other variables to those initial variables has better improvement to explain variance in each criterion variables to some extent. In all cases among all predictor variables used in this study, high school cumulative score and entrance examination are selected by the regression model one after the other.

Generally, some of the variability in each cases remains still unexplained, The remaining variables are also too small to add substantially to the value of multiple R- square in this regard.

4.2 Discussion

In an attempt to investigate the predictive power of the selection criteria that have been used for getting candidates into the Health science colleges, each of those basic questions used in this study is again presented and then thoroughly discussed based on the results presented under section 4.1

Question 1 Do the ESLCE/ EHEECE GPA and Entrance Examination results separately and collectively have statistically significant relationship with first, second and third year academic achievement earned by trainees in health science colleges?

The results of inter correlation matrix of Table 3 to 6 clearly indicate that the locally prepared entrance examination have statistically significant relationship in all academic years performance in all field of studies at the 0.01 level. It appears that on the whole, the entrance examination is a valid indicator

of academic performance in all cases. Because, according to Cohen and Manion (1994) correlations ranging from 0.35 to 0.65 correlations are statistically significant beyond the 1 percent level. Correlations ranging from 0.65 to 0.85 make possible group predictions that are accurate enough for most purposes. Hence, all fields of studies have good predictions that are accurate enough for most purposes. It has also been observed that the explained variance accounted for by this predictor variable in most criterion variables is the best predictor of college GPA among variables considered in this study. This shows that the content of the entrance examination is relevant to health science college curriculum.

In fact, the objective of entrance examination is to procure evidence of the applicants' educational and cultural background scientific knowledge and understanding as well as his/her interest in profession. It is also to assure better selection of students with the minimum wastage of educational resources of course; most training institutes have also made it mandatory for entrants to pass entrance examination as prerequisites for admission on the pre-supposition that their test scores are on of other most important predictor for the success or failure in training institutes.

Therefore, the results of this study regarding entrance examination, as determination criteria in selecting applicants found to be very good in all aspects. The results of this study are thus consistent with some research findings For example, Fantu, et al (1996), Kebede (1991) and Mokennon et al (1991) found entrance examination to be potential predictor of student's future

performance in potential predictor of first year academic performance in higher institutions ((Laekemariam, 1994). Others like Lewis (1964) found it significant predictor of freshman GPA. It seems appropriate to use such examination as sole predictor in assessing the overall background of each applicant. With regard to the predictive validity of the ESLCE/EHEECE GPA(X_2) the results of the intercorrelation from the same table indicate that the ESLCE/ EHEECE GPA has only significant relationship with first year academic scores (Y_1), second year academic scores (Y_2) and third year academic scores (Y_3) in the pharmacy field of study. It also has significant relationship with second year academic scores (Y_2) in clinical nursing field of study According to Cohen and Manion (1994), correlations ranging from 0.35 to .65 are useful when combined with other variables They also go on to say that correlations at this level used singly are of little use for individual prediction because they yield only a few more correct prediction than could be accomplished by guessing or by using some chance selection procedure.

In line with this guideline the magnitude of correlation that, this variable has got with most criterion variables except the three variables mentioned above, range from 0.20 to 0.35 for all fields of study. Even some are below this range. As mentioned earlier in connection with entrance examination, correlation coefficients of this range are of no value in individual predictions,. Even though it was not significant in its contribution, its relationship with second year academic score is better than other years especially in the clinical nursing field of study. This appears to indicate that as the year of training increases, the magnitude of correlations with expected criterion tends to decrease. This was

in fact confirmed by Lewis (1964) that none of the pre-training variables was significant for predicting achievement beyond sophomore level.

However, the results obtained in pharmacy field of study agree with the results of Mekonnen et al. (1991), in that the ESLCE was found to be a potential predictor of the first semester college performance in spite of being the least predictor of other variables used in the study. But some are in agreement with those findings, for example, Laekemariam (1994), found ESLCE to be very poor predictor of first semester in higher institutions, Other like Tassew et al. (1991) and Tracy (1965) also found statistically significant relationships between overall ESLCE GPA and first year training performance. But, Meresa (1994) came up with contradicting findings that ESLCE GPA was not statistically significant with the same year mentioned above. In the remaining academic years the ESLCE, however, was found to be not significant with the respective criterion variable in all cases. These findings are in fact consistent with that of Tamiru (1991). According to him the ESLCE GPA is found to be a valid predictor of training success only for one department in the catering and Tourism Institute for the rest Departments, the ESLCE is not a valid predictor being in line with the findings of Belay (1990) and Kebede(1991). The issue of the ESLCE has been long since its predictive validity has been questioned. Moreover, with regard to the predicative studies made on the EHEECE, Legesse (2006) has reported that EHEECE GPA was found to be poor predictor of the criterion variable and low in predictive ability. The non-significant relationship might be explained due to several factors. For one thing, the courses given in the training institutes may have little

or nothing to do with ESLCE/EHEECE test scores. For another, the restriction in range of ESLCE/EHEECE GPA operates to suppress relationship with criterion variables. It might also be entangled with administrative problems not be serve the purposes vested in it. Thus, the ESELC/EHEECE GPA may not be recommended as the most important selection criteria for better prediction of academic success in training institutions.

Furthermore, predictions were also made regarding the combined effect of the two predictor variables. As can be seen form table 10, the combined effect of these predictor variables is not again significant in predicting most criterion variables particularly in the mid wife field of study. The magnitude of the R^2 was one possible evidence to this statement in mid wife field of study. When examining these relationships with the levels of correlation between each predictor and criterion variables, it reveals that there is some advantage of using the combined predictors even if they were mostly not significant. It can also be argued that since the contribution of each predictor variables is not significant separately, it is not as such surprising to observe the same result again. They are in fact found to be significant in predicting Y_1 , Y_2 and Y_3 in which one of two variable found to be significant an all remaining field of studies (see Table 7,8 and 9). Then the proportion of the explained variance in these criterion variables accounted for by the linear the result combination of predictor variables are mention in the result. In light of the purposes vested in them, the combination of these predictor variables is again expected to explain more than what is actually observes now. There is no clear background to explain why this is so. Because, each predictor variables had no problem of

multicollinearity. They shared a very small amount of common variance in three cases. One of the possible reasons may be, as noted earlier, the contents of these predictors may not be relevant to the midwife group performance, as students with no secondary school mathematics, for instance, will have difficulty in science. On the other hand, in finding out potential predictors between the two, both have high potential predictors in the cases of Y_1 , Y_2 and Y_3 in the three fields of study, as clinical nurse, laboratory and pharmacy. In fact, X_1 appears to be a potential predictor where an inefficient use of X_2 is exposed. In this instance, correlation involving entrance examination was higher than were those involving ESLCE/EHEECE. Moreover, entrance examination was the most predictor variable used for the health science colleges in the three fields of study. This is consistent with the findings Price and Kim (1976) in which entrance examination scores are more significant and important in predicting training performance than other variables. It is in agreement with the findings of some researchers (Grippando, 1986; Oliver, 1985; Plapp et al, 1965) in that the scores of science were significant in predicting academic performance in health science colleges. In general, then it might be concluded that although there was no advantage of using a number of different single predictors, employing the combined predictors did have some merit. In most studies reviewed, therefore, some variables rather than a single variable are also investigated as possible predictors of criterion.

Question 2 which year's academic achievement does the selection criteria predict better?

As it can be observed from Table3 entrance examination scores predict more in second year but it has significant relationship with all variables. This is to reveal that the second year better predicted by entrance examination in the clinical nursing field of study. When it comes to ESLCE /EHEECE GPA the same with the above the second year was better predicted since it has significant negative relationship with this variable. The magnitude of entrance examination is also higher than that of ESLCE /EHEECE. It might also be expected that since formerly mentioned year were found to be significant regarding ESLCE /EHEECE GPA score there are no evidence to support what entrance examination did. Similar results were obtained when X_1 and X_2 were also computed in combination. That is the contribution of these variables together with the first and third year scores are statistically significant by selecting entrance examination only (see table7) .Where as the second year score are significant with two predictor variable. According to the magnitude of R^2 of the second year seems to predict better than the remaining two.

The result display in table6 is; however, completely differ from the group discussed above. Because both of the predictor variables are not significant in predicting any of the criterion (years) used in the study separately. This is the case where the only attempt is made to examine their combined effects in the line with amount of explained variables accounted for by them in each case. Although it was not also significant in combination, Comparisons could be done among years in terms of their

multiple R^2 in both cases. Hence, inspection of table 10 shows that the explained variance of the first year academic score is slightly higher than the explained variance of the majority of the criterion variables when X_1 and X_2 were combined together. That is about 11% of variance in Y_1 was explained, for instance, in the midwife field of study. Yet; there are two years which have closely related amount of variance in the respective year. For example about 9% of the explained variance in Y_2 accounted for by the combination of X_1 and X_2 (see table 10). Moreover, there was no match difference in the magnitude of multiple R^2 for combined effects of X_1 and X_2 for predicting the second and third year scores in the midwife field of study. (see table 10)

On the other hand, the results in table 4 and 5 are also completely different from the group discussed all above. Because, both of the predictor variables are highly significant in predicting the entire criterion variables used in the study. However in the table 4 there is no much difference between academic years but Y_1 score is little bit higher than the others in the entrance examination. The same with that ESLCE /EHEECE GPA is negatively significant in all cases but it is the first year is higher than the other criterion variables. In general the two fields of study do not have any more difference between them. Thus, the results of this study are consistent at least with the finding of Plapp et al (1965) in which the relationship between the intellectual predictor and criterion variables is higher for the first than for the second year in the school of nursing. Furthermore, Snyder and Elmore (1983) also reviewed that most research on the prediction of academic performance in the

training program has limited the criterion to performance in the first year training programs. Over short period of time chance effects are reduced and predictive validity coefficient are increased.

Question 3 Does high school Cumulative score improve the prediction of the trainee's academic achievement in training colleges if it was used in combination with the initial variables?

The primary purpose of third investigation was to determine whether the addition of this variable could improve the predictive power of the entrance examination and ESLCE/EHEECE GPA as treated earlier was found to be almost inefficient in predicting academic performance in health Science College. The some with this, the entrance examination was not significant in the mid wife field of study. But, when one other additional variable was included in the regression model for each field of study, some sort of increment of variance in each criterion variable was observed. This means that the contributions of the combined variables were significant in predicting most criterion variables. It is only with Y_2 of pharmacy field of study that contribution becomes unexpectedly not significant (see Table 7). In other instance, the multiple R^2 was apparently improved in degree at the maximum, for example 33% in Y_1 .

Results of stepwise regression analysis also indicate that X_3 has appeared as the first potential predictor for all criterion variables in clinical nursing, laboratory and midwife field of study. Although, it appears as the predictor for two criterion variables, it doesn't predict in Y_2 (other criterion variables)

Hence, about 57% of the variance in Y_3 was accounted for by X_3 in the pharmacy field of study. But other variable added little to the accuracy of regression function in all cases. The results then support the findings of some prediction studies conducted in similar area. For instance, Oliver (1985) found that score of high school average was potential variable in predicting health science college performance and then recommended to be considered in selection decisions. According to Lewis and Welch (1975) when the contributions of academic scores required in pre-nursing courses is compared with a multiple correlation of all variables in the study, the former variable was very pronounced in prediction. While X_3 is in case of Y_3 that it appears alone, other wise mostly with X_1 . As can be observed from table 7,8 and 9, this variable was entered into the regression model with one of initial variables one after the other. In predicting Y_1 , Y_2 and Y_3 in case of clinical nursing, for example, high school average scores selected by the model in the first place, then followed by entrance examination conversely, in prediction of Y_1 , X_3 was entered first into the model then the other initial variable, that is also entrance examination results was followed in the prediction of Y_1 in pharmacy. In both cases, the accuracy of prediction almost reached by using only the two selected predictors together, The results of study seems to support the findings of this study in which a combination of high school academic performance and entrance examination scores yields a bit better prediction than the entrance examination alone (Laekmariam, 1994)

Similarly, Passons (1967) concluded that only high school achievement was the most predictive indicators of training

performance, entrance examination scores were slightly more reliable than was high school achievement in many instances, a student's entrance examination score, in combination with his/her high school achievement the basis for his/her acceptance or rejection by the school of his/her choice. (Chisson and Lanier, 1975). On the other hand entrance examination results with the high school performance did result in a more accurate prediction of achievements in health science college than did the use of high school achievement alone (Halpin et al., 1981). It was also confirmed that high school achievement commonly found to be the predictor of academic success in training program (Dalton, 1974)

Moreover, X_1 and X_3 were also selected by the model one after the other with all criterion variables in Laboratory. Results of the stepwise regression analysis on Y_1 , for example, indicate that there was overall R^2 of 0.47 in which high school average score contributed 0.61 to the variance in Y_1 high school average score add 0.14 and others contributed virtually zero. (see table7). The same variables were also observed as potential variable in Y_1 and Y_3 with different amount of contribution attached to each criterion. That is high school average score found to be a potential predictor of academic success in training program (Loeb and Mueller, 1970, Price and Kim, 1976). Other authors had also reported that academic achievement in pre- college courses and rank in high school graduating class yielded statistically significant correlations with a criterion of achievement in the nursing program (Brown, 1981, Clemece and Brink, 1978)

Once again, among criterion variables used in the study, first year academic score (Y_1) was relatively better predicted by the combination of those variables. This as usual, supports the findings of other studies, for example, Alichnie and Bellucci(1981) and Halpin, et al(1976) in which most variables are effective predictors of academically achievement at the year in health science college.

CHAPTER FIVE

5 Summary, conclusion and Recommendations

5.1 Summary

Most training colleges often establish minimum selection criteria that are implemented by some admission officials. These officials carry out their task according to a predetermined official nearly always consider a number of relevant non test measures such as high school achievement, rank in class and the like. Since a relatively high proportion of high school graduates go on to further study, the review of their transcript is crucial for selection. Tests then can come some what latter to identify applicants who were at least minimally qualified to begin training more recently, admission test scores have been used in some colleges. Which use of admission test data is most important at any time, depends up on the needs of the training institutes. When the number of applicants exceeds the openings available, test results are used to help colleges select and admit the colleges resources are under- utilized, test results are also used to identify applicants with the potential for with high school performance and some others are used for selection in most training colleges.

In the present study, high school average score, ESLCE/EHEECE GPA in the natural sciences (including Math emetics and English) and a minimum of 50% score on locally prepared entrance examination were used in selecting trainees. These selection criteria are required to provide some means of reducing the

number of wastage from each health science colleges by selecting those candidates who give evidence of being most likely to complete the program. However, inaccuracy of such selection criteria resulted in either losing a potentially productive individual or losing precious resources to a person who does not fit in the colleges. The data were obtained from Awasa Health Science College and then analysed for its accurate prediction in four fields of studies separately. Thus, based on results obtained and discussed so far, the following

5.2 Conclusions

- Entrance examination result is a valid indicator of academic performance in the training institutes in almost three fields of study but not in midwife field of study.
- The ESLCE/EHEECE GPA has not significant relationship with all academic years score in almost all fields of study.
- Except mid wife field of study, the combined effect of entrance examination and the ESLCE/EHEECE GPA are significant in predicting all criterion variables throughout academic years.
- First year academic score and second year academic scores are better predicted by entrance examination result and ESLCE/EHEECE in combination in three fields of study. But midwife field of study second year academic score is better predicted. Other criterion variables are however, not significant with those initial predictors in the mid wife field of study in particular.

- The entrance examination results are found to have a better predictive power than ESLCE/EHEECE GPA in clinical nursing, laboratory and pharmacy fields of studies.
- Using such inefficient selection criteria, therefore, represent wastage of efforts for the admission officials a serious loss of resources (i.e. potential applicants, money, time and the like) and a serious inconvenience For the Society at large.
- The addition of other variables (i.e. high school averages scores) to these in initial predictors (entrance examination and ESLCE/EHEECE GPA) has been observed as the only potential predictor in all field of study.
- Among all predictor variables used in the study, high school average score improved the prediction accuracy in most cases.
- The combination of these predictors together relatively better predict all academic year scores.
- In general, the predictive ability of predictor variable used in the study seems to vary from one field of study to another, depending on elements which the investigator is unable to test or control cutoff point of ESLCE/EHEECE GPA, environment with in the health science program which can have an indirect relationship to academic achievements.

5.3 Recommendation

It can, therefore, be recommended from the above conclusions that:

- ❖ Taking some information from student's transcript (average score of all subjects in high school) into account will make the selection criteria more accurate.
- ❖ Difference between the two sexes on selection should be expected for males and females during selection as it is the case today for EHEECE GPA in higher education. Admission decision makers should, therefore, give a critical thought to their faith in the selection ratio of two sex groups to implement practically.
- ❖ The active participation of training colleges in selection process will improve the prediction of such measures. The training collages, of course, have greater responsibility for it is only through them that the potentiality detected by such selection method can be actualized and brought to fruition.
- ❖ Since an evaluation of this selection criteria is not an end by it self, continues assessment should be required from time to time. Attempts, therefore, be required to established a systematic and meaning full selection criteria to screen potential prospective for Health Science College Students.
- ❖ Evaluating such selection criteria is only possible when complete documents are available in training collages. Training collages, therefore, admit applicants with all necessary documents so that any interested body in the field can easily conduct research.

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APPENDIX

Variable Designation

Below are shown specifications and designation of variable used in this study.

X_1 = Entrance examination scores

X_2 = ESLCE/EHEECE GPA

X_3 = High school average scores

X_4 = Sex=1, if male, =0, if female

The Criterion variables used for validation

Y_1 = First year average score

Y_2 = Second year average score

Y_3 = Third year average score

Year I Summary Grade of 10 + 3 Clinical Nurse Students/ 1996 E.C. Intake /AWASSA

Course	Cr.Hour
BPPN In School Tra.	18
BPPN Projec	2
BPPN App.	12
PSN in school	5
PSN Project	1
PSN Appr	5
Emer. In School Tra	7
Emer. Project Work	1
Emer. App	6
Human Anatomy	3
Human Physilology	4
Microb.& Paras	4
In.to Psy	2
In.to Socio	2
Ethico.	2
Nursing Health	2
Mathematics	5
English	5
Civics	4
Int. to web page dev	4
Entrepre.	6

**ACHS OFFICE OF THE REGISTRAR
GRADE SUMMARY FOR 10 + 3 STUDENTS
CATEGORY CLINICAL NURSE YEAR II INTAKE 1996 E/C**

Course	Cr.Hour
Med/sur In school	26
Project work	4
Apprenticeship	17
Mat. In sch. Tran	7
Project work	2
Apprenticeship	6
Nutrition	2
Pharmacology	4
Health Educ	2
Commun. Dis.	4
Psychiatric Nurs.	2
Mathematics	5
English	5
Civics	4
Int.to IT	4
Sma. Bus Mgt	6

**ACHS OFFICE OF THE REGISTRATION
 GRADE SUMMARY FOR 10+3 STUDENTS
 CATEGORY CLINICAL NURSE YEAR III INTAKE 1996 E/C**

Course	Cr.Hour
Ch.H. In school train.	23
Ch.H Project work	3
ch. H. apprenticeship	13
Rep.H In school train	7
Rep. H Project work	2
Rep.H Apprenticeship	4
NSM In school train.	3
NSM project work	1
NSM Apprenticeship	3
NRTA In sch. Train	4
NRTA project work	1
NRTA Apprenticeship	3
Epidemiology	2
Environmental Heal	2
Health statistics	2
Mathematics	5
English	5
Civics	4
Int. to web page dev.	4
Business growth strategy	6

**SUMMARY OF GRADE REPORT FOR 10+3 1996 INTAKE PHARMACY TECHNICIAN
STUDENTS YEAR I**

YEAR II

Course	Cr.Hour	Course	Cr.Hour
Ana & Phy.	8	Dispen .In scholl train	35
Organ.Chemistry	9	Project Work	5
Bio.Chem	6	Apprentice ship	22
Pha.Micro& Para	7	Pharm Calc.	3
First Aid	3	Pharmaceutics	6
Psychology	3	Epidemiology	2
Comple.Medicine	5	Prof. Eth.& Jur	2
Pharmacology.	20	Heal.& Drug Edu.	1
Pharmacognocy	7	Mathematics	5
Mathematics	7	English	5
English	7	Civics	4
Civic	5	Int. to IT	4
Intro.to IT	5	Sma. Bus. Mana	6
Entrepren	8		

YEAR III

Course	Cr.Hour
Dru. & med sup.in sch.trai	6
Project work	2
Apprentice ship	6
Pharm. Manu. In sch. Tra.	15
Project work	2
apprentice ship	10
Phar. Anal. In sch.trai.	2
Apprentice ship	8
Hospital pharmacy	2
Analytical Chemistry	6
Biostatistics	4
Research Methodology	2
Mathematics	5
English	5
Civics	4
Int.to IT	4
Business growth strategy	6

**Summary Grade for 10 + 3 Laboratory Technician Students /1996 Intake/
Year I**

Course	Cr.Hour
Sp.Coll, In School Trai	14
Sp. Coll. Apprent	9
Para.Diag. In School Trai.	19
Para.Diag. Apprent	13
Hum. ana.& Physiology	6
Int.to Medical Lab	5
Human Parasitology	5
Health Education	1
First Aid	2
Psychology	2
Mathematics	5
English	5
Civics	4
Int. to IT	4
Entrepre.	6

Year II

Course	Cr.Hour
Dispen .In scholl train	7
Project Work	5
Apprentice ship	22
Pharm Calc.	3
Pharmaceutics	6
Epidemiology	2
Prof. Eth.& Jur	2
Heal.& Drug Edu.	1
Mathematics	5
English	5
Civics	4
Int. to IT	4
Sma. Bus. Mana	6

YEAR III INTAKE 1996 E/C

Course	Cr.Hour
Cl.Ch.In school tarin	13
Cl.Ch.Project work	3
Cl.ch.Apprenticeship	10
In school train.	6
Project work	1
Apprenticeship	5
Immuno ser. In school train	9
Immuno ser. Project work	2
Immuno ser. Apprenticeship	7
Immunoematology	2
Clinical Chemistry	6
Immunology & serology	5
Heal lab mgt & qua.con	3
Epidemiology	2
sociology	2
Mathematics	5
English	5
Civics	4
Int. web page dev.	4
Business growth strategy	6

**Summary grade for 10+3 Midwife Students /1996 Intake/
Year I**

Year I		Year II	
Course	Cr.Hour	Course	Cr.Hour
ANC in school	19	Labo. & Deli.In sch. Tran.	21
ANC Project	2	Project work	5
ANC App.	14	Apprenticeship	12
F/P in school	11	Postnatal. In sch. Tran.	7
F/P Apprent	8	Project work	2
An/Phy.	6	Apprenticeship	10
Ethics	1	Pharmacology	4
First Aid	2	Med. Surg.	4
Microbiology	4	Basic Nur. Art II	7
Nursing Art	5	Env. Heal. & Per. Hyg	2
Health Educ.	1	Epidemiology	2
Nutrition	1	Mathematics	5
An/Phy.Repro	2	English	5
Mathematics	5	Civics	4
English	5	Int. To Com. Net	4
Civics	4	Sma. Bus mgt	6
Int to IT	4		
Entrepri.	6		

**ACHS OFFICE OF THE REGISTRAR
 GRADE SUMMARY FOR 10 + 3 STUDENTS
 CATEGORY MIDWIFE NURSE YEAR III INTAKE 1996 E/C**

Course	Cr.Hour
CGp. In school train.	18
CGP Project work	6
CGP Apprenticeship	12
CHC In school train.	12
Chc project work	5
CHC Apprenticeship	10
Communicable Dis.	5
Physical Diagnosis	2
Int.to research	1
Basic vital statistics	1
Health Mgt	2
Social Science	2
Mathematics	5
English	5
Civics	4
Int. web page dev.	4
Business growth strategy	6

Declaration

I, here by confirm that this thesis is my original work and has not been present for a degree in any other university and that all resources of material used for this thesis have been duly acknowledged.

Name Samson Fekadu

Signature 

Date of Submission _____

This thesis has been submitted for examination with my approval as university adviser.

Name **Ayele Meshesha** (Ph.D.)

Signature _____

Date _____