Open Praxis, vol. 10 issue 3, July–September 2018, pp. 237–247 (ISSN 2304-070X)

OPEN PRAXIS
INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION

Entry qualifications of students as predictors of academic performance in various degree programs in distance education setting in Pakistan

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Abstract

Academic performance of students has always been the area of concern for educational institutions as it is a key indicator of institutional quality. In order to have a better quality output the higher education institutions set some admission criteria such as scores on specified international standardized tests, previous academic qualifications, and admission tests of students or a combination of such scores. Virtual University of Pakistan (VU) is a technology-based distance learning institution that facilitates students who are unable to attend traditional institutions of higher education for a variety of reasons. It was of interest to the researchers to study the entry qualifications of students i.e. the admission criteria, as predictor of their academic performance in various degree programs at VU. For that purpose, the data of 5825 graduates in different two years masters programs in 2015-16 were taken as sample. The entry qualifications of students, and cumulative scores of their previous academic qualifications were taken as predictors of their performance i.e. cumulative grade point average (CGPA,) in relevant degree program. Descriptive (range, percentage) and inferential (pearson r, multiple regression) statistics were applied after grouping the students into low, average and high achievers on cumulative scores as well as entry qualification scores. The results showed significant differences in the predictions and their implications are useful for policy makers and relevant departments of the university as well as for other distance learning educational institutions.

Keywords: Entry qualifications, academic performance, distance education, cumulative scores, Pakistan

Introduction

Quality of the graduates of an educational institution including universities is considered the most important indicator of its quality. On the basis of systems approach, input and output model, it is believed that better quality input students will perform better in terms of learning and achievement. Therefore, universities lay stress on taking those students who could perform better in relevant degree programs. For that purpose universities set certain criteria of admissions. Most common are the aptitude tests, standardized tests, and entry qualification scores, aggregate of previous academic performance scores, interviews or a combination of any or some of these. Purpose of all these criteria is to get a good input in the form students who could perform better. Teacher educators and researchers across the globe have been keen to identify the factors that predict the achievement of the students in different degree programs (e.g. see, Durotolu, 1994; Hijazi & Naqvi, 2006; Jayanthi, Balakrishnan, Ching, Abdul-Latif, & Nasirudeen, 2014; and Kasworm & Pike, 1994).

Many researchers have found significant positive correlation between the school academic performance/entry qualification and tertiary level scores of students. For example, Ogbonnaya, Okpuruka, Iheanacho, and Ndu (2014) studied the correlation between the entry qualification and academic performance of university students and found a positive significant relationship between the two scores. Kapinga and Amani (2016) studied the correlation of entry qualifications and students' academic performance in undergraduate study programs in Tanzania and found a significant positive

Reception date: 1 March 2018 • Acceptance date: 31 July 2018
DOI: https://doi.org/10.5944/openpraxis.10.3.848

correlation between the two. Chathuranga (2016) studied the previous academic qualification scores of students and their university Cumulative Grade Point Average (CGPA) in Srilankan context. This study did not find any correlation between the scores of primary level and university CGPA but it did find a significant positive correlation between O-level and A-level examination scores with university CGPA. Cyrenne and Chan (2010) studied the high school grades of students and their university performance in one university in Canada and found significant correlation between the two variables. Zwick (2013) in education testing service (ETS) report on high school grades and SAT tests in predicting students' achievement at tertiary level, illustrated three large scale studies carried out in US. It was noticed that high school grade point average scores of students were predicting (R^2) 13% to 21% while SAT scores of students were predicting only 12-13% of their achievement at tertiary level. Combining the two types of tests i.e. high school grades and SAT scores showed prediction value of 21%-22%.

There are studies that have found low correlation values between entry qualification and university academic performance and hence low predictions from entry qualification scores. For example, Obioma and Salau (2007) have found that the entry qualifications of students measured by their grades from West African Examination Council (WAEC), National Examination Council (NECO) and Joint Admissions and Matriculation Board (JAMB) examinations had low correlation with their first and final year's performance in the universities. House and Johnson (2002) studied the relationship of GRE scores with the students' achievement from different disciplines (degree programs) in university and found significant correlation but value of correlation coefficient to be ranging from weak to medium strength for different degrees. The students who were high on GRE scores were also high on university scores.

Agbo (2003) conducted a study on different science subjects at university level and identified low correlation between entry qualifications and students' performance. Okonkwo (2000) discussed that there is often an inconsistency in entry point and achievement score of students in tertiary institutions. He pointed out that this made it difficult to predict final performance using entry qualification grades.

Taking a sample from on-campus and distance teaching education students Wambugu and Emeke (2016) reported differences in the correlations and predictions between the entry qualification scores and student achievement scores in three different science subjects at undergraduate level. It was noted that on-campus students were performing better than distance education students in one subject only. This high performance in one subject was due to high entry qualification score of on-campus students than distance learning students. In the other two subjects there was no significant difference in the performance of on-campus and distance learning students. That study also observed slightly positive and significant but low correlation between the entry qualifications and academic achievements of both student types. This showed that previous/entry academic scores are predictors of tertiary level performance for both on-campus and distance learning students.

Ali, Haider, Munir, Khan, and Ahmed (2013) studied the factors contributing towards academic performance of students at a Pakistani university. They did not find any correlation between the previous academic scores and degree qualification scores. However, they found the role of demographic variables as significant contributors toward academic performance.

A number of studies on the relationship between entry qualification and academic performance indicate that students with high entry qualification scores often perform better than those with low entry qualification scores (Adedeji, 2001; Aderson, Benjamin & Fuss, 1994; Alias & Zain, 2006; Zezekwa & Mudavanhu, 2011).

The above-cited literature showed some inconsistency in the correlation of entry academic qualifications and academic achievement scores of students. In this paper the researchers intended

to see the predictions for academic performance of students from the admission criteria i.e. entry qualification scores, in Pakistani context.

In Pakistan, online and distance learning educational institutions are still at infancy stage and there is a vacuum of research in this mode of education. Virtual University of Pakistan (VU) is the first online technology based distance learning university in Pakistan. At VU the admission criteria for all undergraduate programs is minimum 45% marks or Cumulative Grade Point Average (CGPA) of 2.0/4.0 in the last degree. For M. Phil it is at least 2.5/4.0 CGPA in the last degree (Admission Eligibility Criteria, 2016-17). VU offers degree programs of various duration, ranging from one year (two semesters) to four years (eight semesters). Only a few certificates, however, are of 18 weeks (1 semester) duration. The assessment of the students at VU is based on the mid-term, final term, assignments, quizzes, graded discussion boards, and in some faculties, internship reports and viva voce examination. In this, information technology based education mode in Pakistan, the correlations and predictions between previous cumulative qualification scores, entry qualification scores and present academic performance of students becomes more valuable to study in order to see the trends and patterns (Alias & Zain, 2006; Mlambo, 2011).

Objectives of the Research

Based on the review of the literature, the following objectives of the present research were designed:

1. To explore the possible correlations between entry academic qualification score, cumulative score and academic performance of students in various degree programs at VU.
2. To find out the predictions made from entry academic qualification scores about academic performance of students in various degree programs at VU.

In order to achieve the above stated research objectives, these research questions were formulated:

1. Do students with different levels of cumulative scores of previous academic qualifications perform differently at VU?
2. Do students with different levels of entry qualification scores perform differently in various degree programs at VU?
3. To what extent does entry qualification and cumulative score predict the academic performance of students in various degree programs at VU?

Methodology

Using cross-sectional design, predictive correlation research method was used in this research. The academic qualification marks i.e., matriculation (10 years education), intermediate (12 years education), and CGPA/ marks of bachelors (14 and 16 years education) were cumulated and then their relationship with the CGPA of their degrees completed at VU was analyzed using pearson r product moment formula. The relationships of entry qualification scores and cumulative score of previous qualifications with VUCGPA were calculated. Multiple regression analysis was also used to see predictions from cumulative scores and entry qualification scores taken as independent variable.

The population of this study was the students who completed their 2 years master degree programs from VU in the years 2015 and 2016. The sample did not include those students who failed in these degree programs; only the data of pass students were taken. The secondary data of their complete academic record including: Matriculation, Intermediate, and Bachelors (two years, 4 years) and their CGPAs achieved in various degree programs at VU were obtained from the

VU through formal request. Degree programs were also segregated into major disciplines and correlations between VUCGPA in those disciplines and cumulative and entry qualification scores were also calculated. The data were further categorized into low achievers, average achievers and high achievers separately for 1) cumulative score and 2) entry qualification score. The correlations were seen separately for low, average and high achievers based on cumulative scores and entry qualification scores.

Ethical Considerations

Ethical considerations in data collection were followed. Formal requests to the examination, administration and networking department were made duly channelized and following the university protocols. Anonymity of the data was also assured and ensured by the researchers.

Significance of the Research

The results of this research are significant in predicting the student performance based on their entry qualifications. Other studies may be conducted based on the recommendations of this research to expand the empirical evidence on students' achievement in distance learning education. This research can be important for the university administration for revisiting admission policy. It may also suggest providing individualized support to students with different academic performance backgrounds.

Delimitation of the Research

The researchers delimited the current research to measure the predictions of academic achievement score based on entry qualification scores and cumulative scores only. There was no cause and effect relation established in this research. It was further delimited to the students who passed different masters' degree programs in the years 2015 and 2016.

Results

The descriptive and inferential statistical analysis is explained as under. For clarity and better understanding the results of masters' program are presented in a sequence of cumulative scores' correlation with VUCGPA, predictions from cumulative scores, subject wise correlation between VUCGPA and cumulative scores, entry qualification score and their correlation with VUCGPA, predictions from entry qualification scores, and subject wise correlation between VUCGPA and entry qualification scores separately.

When Pearson r was applied to see the correlation between VU CGPA and cumulative score of all previous academic degrees of the students, it was found that significant positive correlation existed in the two scores. Correlations between VU CGPA and previous academic qualification scores were also calculated separately. All values of correlation coefficient presented in table 1 were significant at $p < 0.01$.

Table 1: Correlation of matric, intermediate, bachelors, and cumulative scores with VU CGPA

	VU CGPA	Matric	Inter	Bachelors	Cumulative
VU CGPA	1.000	.300**	.271**	.222**	.340**

**p<0.01

Multiple regression analysis was used to determine the predictions of matric, inter, and bachelors scores taken as independent variable for VU CGPA taken as dependent variable. The predictions made were 11.8% significant and significant contributions to this prediction were from all the previous qualification scores. However, this prediction of 11.8% does not establish that VU CGPA can be predicted only through previous academic scores. There could be some other factors along with the previous academic qualification scores that contribute in the CGPA of VU students. The standardized beta coefficients and t-values can be seen in table 2.

Table 2: Multiple regression by taking matric, inter, bachelors as independent variables and masters CGPA as dependent variable

	Adjusted R Square	Standardized Coefficients	*t*	*p*
		Beta		
constant	.118		37.707	.000
Matric		.204	14.330	.000
Inter		.131	8.822	.000
Bachelors		.097	7.002	.000

To further probe into the data the students were categorized into low achievers, average achievers, and high achievers based on their cumulative scores. The cumulative scores were calculated by adding the scores of students for their matric, intermediate and graduation external examination. The baseline or standard marks for matric were 850, for intermediate were 1100, and for bachelors were 800. By adding these three scores the sum gets 2750. Out of this total 2750 score of the last three academic qualifications the highest marks obtained score was 2421 and the lowest was 821. These cumulative scores of students were divided into 3 sets of almost equal range to categorize the students into high, average and low achievers. This categorization was made after dividing the number of students (5825) by three; it gives 1941.67. Approximately, 1942 students were included in each of the three categories (low, average, and high). The small variation present in the number of students in different categories each category is due to including the students with same scores in one category.

Table 3: Categorization of students on the basis of cumulative achievement scores

Category	Marks Range	N
Low Achievers	821-1515	1941
Average Achievers	1516-1683	1946
High Achievers	1684-2421	1938
All	821-2421	5825

In table 4 the correlations of VU CGPA was calculated with the previous academic qualification scores in terms of low achievers, average achievers, and high achievers categories as made in table 3. It was observed that high achievers based on cumulative scores were showing significantly

higher correlation with the VU CGPA followed by average achievers and the lowest correlation was found for low achievers. These results lead to infer that those who were high achievers in the cumulative scores were also performing high at the VU. The values were significant at $p < 0.01$ as seen in table 4.

Table 4: Correlation of VU CGPA with previous academic performance scores - cumulative and by categories—low, average, high achievers

Category by Cumulative scores	Matric	Inter	Bachelors	VUCGPA
Low achievers	.065**	.019	.028	.077**
Average achievers	0.124**	-.042	.020	.121**
High achievers	.182**	.193**	.110**	.256**

**p< 0.01

The table 5 depicts the subject wise correlations between VUCGPA and cumulative scores. The masters' degree programs were segregated into different disciplines. The four major disciplines in the masters' degree programs were: business administration; commerce; computer science (CS) and Information technology (IT); and social and behavioural science. The correlations between VUCGPA of business administration discipline and previous academic cumulative scores were highest among the disciplines followed by social and behavioural science discipline and CS & IT. The correlation between VUCGPA of commerce discipline and cumulative score was the least among these disciplines. The correlation coefficient values presented in the table 5 were significant at $p < 0.01$.

Table 5: Discipline wise correlation between VUCGPA and cumulative scores of previous academic qualifications

Subject wise VUCGPA	N	Cumulative score
Business Administration	2895	.359**
Commerce	520	.305**
CS & IT	2172	.309**
Social & Behavioural Sciences	238	.352**

**p < 0.01

The table 6 categorizes the students in to low, average, and high achievers on the basis of their entry qualification scores. The criteria of categorizing the students into three groups were the cut point marks of 1st division (high achievers), 2nd division (average achievers) and 3rd division (low achievers).

Table 7 demonstrates the correlation values of low, average, and high achievers based on the entry qualification scores were showing higher correlation of average achievers with VU CGPA than the high achievers. However, the difference in the correlation values was very small. The correlation of bachelor degree low achiever scores was negative with the VU CGPA. It meant that entry qualification low achievers scores do not have any relationship with how these students

Table 6: Low, average, and high achievers on the basis of their entry qualification scores

Categories	Range	N
Low achievers (3rd Division)	Up to 359	280
Average achievers (2nd division)	360-479	4093
High Achievers (1st Division)	480 and above	1566
All	288-796	5825

perform in VU. The reasons could be, either the number of students in the low achievers category was less, or it could be the equal learning opportunity and fair assessment at VU that it boosted their performances in VU. The predictions made from entry qualification were only amounting to 4.9%.

Table 7: Correlation of (low, average, high achievers on the basis of entry qualification scores [bachelors]), and predict of entry qualification score with VU CGPA

Bachelors	VU CGPA
Low achievers	–.070
Average achievers	.136**
High achievers	.109**
R^2	.049

**p< 0.01

Table 8 reflects the correlations between VUCGPA of different disciplines and entry qualification scores of students. The highest correlation coefficient value was for commerce discipline followed by social & behavioural science and business administration disciplines. The lowest value of correlation was for CS & IT discipline. The values given in table 8 were significant at $p < 0.01$.

Table 8: Disciplines wise correlation between VUCGPA and entry qualifications scores

Subject wise VUCGPA	N	Entry qualification score
Business administration	2895	.235**
Commerce	520	.290**
CS & IT	2172	.219**
Social & Behavioural Sciences	238	.245**

**p < 0.01

Discussion

This research strived to achieve two objectives. The researchers applied various descriptive and inferential statistical analyses on the data to address those questions.

Research objective 1. To explore the possible correlation between entry academic qualification score, cumulative score and academic performance of students in various degree programs at VU.

In order to achieve this objective, researchers designed these two research questions. (1). Do students with different levels of cumulative scores of previous academic qualifications perform differently at VU? (2). Do students with different levels of entry qualification scores perform differently in various degree programs at VU?

To address the first research question, the researchers grouped the previous academic qualifications of students of masters' program students. After cumulating their previous academic scores the researchers categorized students in low, average and high achievers category. The correlations of cumulative scores and VUCGPA were determined in terms of coefficient of correlation of pearson r product moment. For masters' students the overall correlation of cumulative scores with VUCGPA was 0.340, which was considered as significant positive. The correlations of low, average and high achievers on the basis of cumulative scores displayed high achievers to be correlating higher with the VUCGPA than the average achievers, and average achievers showed higher values than low achievers. This was consistent with the literature; we see many studies in conventional educational institutions that report to have such correlations (Aidoo-Buameh & Ayagre, 2013; Alias & Zain, 2006; Braunstein, 2002; Dalziel, & Peat, 1998). To dig further in the data, the masters' degree programs were segregated into different disciplines. The discipline wise correlations of four major disciplines were also calculated between cumulative scores and VUCGPA. VUCGPA of Students in business administration discipline was showing the highest correlation with the cumulative scores. Then correlation of social science discipline was higher than that of CS & It discipline VUCGPA and cumulative scores. The lowest of all correlation was between commerce discipline VUCGPA and cumulative scores. This was another limitation of this research, as it did not evaluate the variation in the correlation values among different disciplines. However, this is not uncommon in such research (e.g. see, Wambugu & Emeke, 2016). The researchers recommend a research to find variations in the correlation values of cumulative scores and their VUCGPA in different discipline students This was how first research question was answered.

Second research question was to see these relations with entry qualifications. For that purpose the researchers categorized the data into low, average, and high achievers on the basis of their last degree scores. The criteria were discussed in the results section of this paper. For masters' students, the scores of the students categorized as low achievers were showing negative relationship with VUCGPA. This could be attributed to a variety of reasons. For one, the students who were categorized as low achievers got third division in entry qualifications. VU usually do not offer admissions to students with third division degree but when they do they require the students to enroll in a zero semester. Once the students get passed with at least 2.0 CGPA in the zero semester then only they can proceed with the degree. Therefore, this zero semester already enables the students to get familiar with the VU system and mode of education. This could be why they perform better in the VU. Another reason could be the fair assessment system of VU that eliminated all biases of the teachers that might prevail in conventional educational systems. In VU the teachers are unable to identify the students and they can only mark the items randomly without knowing who the student actually is. Because the papers are computer generated and every student gets a different question out of the item bank. Along with this, the papers of students are also marked in terms of items only. A teacher only gets to the check the items with no identification of student name or student number, not even a complete paper of any student. The papers are marked in terms of items only and then the examination centre compiles the results of the students. This makes the examination system of VU fair hence eliminating any or all biases. Third reason could be the less number of students in the low achievers category. This is for a fact that when pearson r has lesser values as input it shows insignificant results.

This is in line with the results from the studies of Jansen (2004), McCarey, Barr and Rattray (2007), McKenzie and Schweitzer (2001). As mentioned previously, the master degree programs were segregated into four major disciplines and correlations between VUCGPA of such disciplines and entry qualification scores were also calculated. The correlations were highest between commerce discipline VUCGPA and entry qualification score. After commerce discipline the second highest value of correlation was of social & behavioural science disciplines followed by the correlation value of business administration disciplines and the lowest among these disciplines was the correlation between VUCGPA of CS & IT discipline students and their entry qualification scores. The reasons for this variation of correlations among different disciplines were not addressed in this research. Not only this variation in the correlation but also the variation in the correlation values of disciplines on the basis of cumulative scores and entry qualification scores was also asymmetrical. Researchers suggest a separate study to find such irregularities in the patterns of correlation in the disciplines. In this way, the researchers had addressed the two research questions. Hence, the first objective of this study was achieved.

Research objective 2. To find out the predictions made from entry academic qualification scores about academic performance of students in various degree programs at VU.

To achieve this objective the researchers pursued with this research questions. To what extent does entry qualification score of different levels predict the academic performance of students in various degree programs at VU? To answer this question, multiple regression analysis was run on the data. For masters' students the predictions from the cumulative scores were amounting only to 11.8% with significant contributions from matriculation, intermediate and bachelors' scores. The study of Dalziel and Peat (1998) in University of Sydney found that first semester high CGPA of the students was predicted by their high grades in secondary school. The prediction for VUCGPA made from the entry qualification scores was only 4.9% reflecting other unstudied factors to be considerable in predicting VUCGPA. This is how objective number to was achieved for this study.

Conclusions and Recommendations

Based on the analysis done above, it is concluded that in distance education setting in Pakistan, the students in masters are performing in the same pattern as mostly found in the literature about conventional education students. This is concluded based on the result that students with high marks on cumulative scores performed better than those with low and average marks in the cumulative scores. Some coarse patterns were seen in the relationship of entry qualification scores with the recent CGPAs in master degree programs. When the students were categorized into low, average and high achievers on the basis of their performances in the entry qualifications the correlations were weak and could not establish any considerable relationship with their performances in different masters' program at VU. Predictions from cumulative scores were also not very encouraging as it amounted to only 11.8% for masters programs. Across different disciplines in masters' degree program there were variations in the correlations. Researchers conclude that this uneven correlation patterns were because the mode of education of previous degrees was not similar, it could be regular or it could be distance education. Therefore, the researchers recommend to identify the previous mode of education of students and then to compare their correlations and predictions in different disciplines. That correlation comparison should be based on two patterns i.e. a) students who had previous education in regular setup—their correlations with their different degree programs at VU and b) students who had previous qualifications through distance education—their correlation with their performance in different degree programs at VU. Identifying the correlations and predictions on such patterns may help the university in any reconsideration of the admission policy.

Limitations of the Research

This research had certain limitations. The researchers could only access the previous academic marks of the students and not the mode of education and institution type from which the students had completed those degree programs. The researchers considered this a limitation because the present academic achievement of students is measured in a distance-learning mode of education. For better prediction of their performances the researchers assume that previous modes of education of students should have been mentioned in the research. In low achievers on entry qualification scores, the correlation with VUCGPA was negative and insignificant. Another study is suggested here by the researchers to dig further into the data to explore reasons of this variation and to find how these average achievers and low achievers in the above-mentioned programs have actually performed in VU.

References

Adedeji, O. B. (2001). *A study of the Relationship between Students UME Results and their Undergraduate Performance* (unpublished Master's Thesis). University of Ibadan, Nigeria

Aderson, G., Benjamin, D. & Fuss, M. (1994). The Determinant of Success in University Introductory Economics Courses. *Journal of Economic Education, 25*(2), 99-120.

Admission Eligibility Criteria (2016-17). *Prospectus for students of VU* (2016-17). Virtual University of Pakistan: VUP.

Agbo, S.A. (2003). A learning community model for professional development and transformational teacher education: Linking teacher preparation with in-service teacher learning and school improvement. In D.S. Preston (Ed.), *The Idea of Education* (pp. 17-32). New York: Rodopi.

Aidoo-Buameh, J., & Ayagre, P. (2013). The Effect of Entry Grades on Academic Performance of University Accounting Students: A case of Undergraduates of Central University College. *Research Journal of Finance and Accounting, 4*(7), 198-206.

Ali, S., Haider, Z., Munir, F., Khan, H., & Ahmed, A. (2013). Factors contributing to the students' academic performance: A case study of Islamia university sub-campus. *American Journal of Educational Research, 1*(8), 283-289.

Alias, M. & Zain, A. F. M. (2006). Relationship between entry qualification and performance in graduate schools. *International Education Journal, 7*(3), 371-378.

Braunstein, A. W. (2002). Factors determining success in a graduate business program. *College Student Journal,* Sept 2002.

Chathuranga, C. D. (2016). The impact of past education performance on grade point average in the faculty of social sciences, university of Keaniya, Srilanka. *International Journal of Humanities and Social Sciences, 6*(4), 101-109.

Cyrenne, P. & Chan, A. (2010). *High school grades and university performance: a case study. Department of Economics working paper: 2010-02*. The university of Winnipeg, Canada.

Dalziel, J., & Peat, M. (1998). Academic performance during student transition to university studies. In R. Stokell (compiler), *Proceedings of the Third Pacific Rim Conference on the First-year in Higher Education.* Vol. 1 (Auckland, Auckland Institute of Technology), Paper No. 29. [verified 6 Jan 2004]. Retrieved from http://www.qut.edu.au/talss/fye/papers98/JD-MP98.DOC

Durotolu, A. O. (1994). Entry qualification and periodic assessment as predictors of end-of-semester performance of the students of the college of education. The Nigerian Teachers (Today). *A Journal of Teachers Education, 3*, 107-115.

Hijazi, S. t., & Naqvi, S. M. R. (2006). Factors affecting students' performance A case of private colleges. *Bangladesh e-Journal of Sociology, 3*(1), 1-10.

House J. D. & Johnson J. J. (2002). Predictive validity of the graduate record examination advanced psychology test for grade performance in graduate psychology courses-Statistical Data Included. *College Student Journal*, *36*(1), 32-36.

Jansen, E.P.W.A. (2004). The influence of curriculum organization on study progress in higher education. *Higher Education 47*, 411-435.

Jayanthi, S. V., Balakrishnan, S., Ching, A. L. S., Abdul-Latiff, N. A., & A.M.A. Nasirudeen, A. M. A. (2014). Factors Contributing to Academic Performance of Students in a Tertiary Institution in Singapore. *American Journal of Educational Research, 2(9),* 752-758.

Kapinga, O. & Amani, J. (2016). Determinants of students' academic performance in higher learning institutions in Tanzania. *Journal of Education and Human Development, 5*(4), 78-86.

Kasworm, C. E., & Pike, G. R. (1994). Adult Undergraduate Students: Evaluating the Appropriateness of a Traditional Model of Academic Performance. *Research in Higher Education, 35*, 689-695. http://dx.doi.org/10.1007/BF02497082

McCarey, M., Barr, T. & Rattray, J. (2007). Predictor of academic performance in a Cohort of pre-registration nursing students. *Nursing Education Today, 27*(4), 357-364.

Mckenzie, K. & Schweitzer, R. (2001). Who Succeeds at University? Factors predicting Academic performance in first-year Australian University Students. *Higher Education Research and Development, 20*(1), 21-33

Mlambo, V. (2011). An analysis of some factors affecting student academic performance in an introductory biochemistry course at the University of the West Indies. *Caribbean Teaching Scholar, 1*(2), 79-92.

Obioma, G. & Salau, M. (2007). The Predictive validity of public examinations. A case study of Nigeria. Paper presented at the *33rd Annual Conference of International Association for Educational Assessment (IAEA)*, Baku, Azerbaijan, 16-21 September, 2007.

Ogbonnaya, N. P., Okpuruka, P. O. U., Iheanacho, P, N., & Ndu, A. (2014). Students' entry qualification and academic performance in basic schools of nursing in Enugu state between 1995 and 1999. *Creative Education, 5*, 719-727.

Okonkwo, S.C. (2000). Relationship between some school and teacher variables and student achievement in mathematics. *Journal of STAN, 35*(1&2) 43-49.

Wambugu, L. N., & Emeke, E. A. (2016). *Relationship between Entry Qualification and Academic Performance in Undergraduate Science Courses at the University of Nairobi, Kenya.* Paper presented at Third International Conference of the African Virtual University (AVU) on Integrating Mobile Learning to Open up Access to Quality Education and Training Opportunities in Africa, Kenya.

Zezekwa, N., & Mudavanhu, Y. (2011). The effects of entry qualification on students' performance in university science courses: The case of Bindura University of Science Education. *African Journal of Education and Technology*, *1*(3), 32-39.

Zwick, R. (2013). *Disentangling the role of high school grades, SAT scores, and SES in predicting college achievement.* ETS Research report series. ETS RR-13-09. Princeton, New Jersey.