

Full Length Research Paper

Measurement of intellectual functioning of Nigerian youth: the predictive validity of JAMB/UME in relation to students' performance in University

D. O. Igwue and O. Adikwu

Department of Educational Foundations and General Studies, University of Agriculture, Makurdi, Nigeria

Abstract

Various institutions of learning and examination bodies take part in the measurement of intellectual functioning of youths for purposes of certification and admission into higher levels. In this study, 2009 Joint Admissions and Matriculation Board (JAMB)/ University Matriculation Examination (UME) scores of 222 candidates admitted to the University of Agriculture, Makurdi, (UAM), were examined in relation to their performance in the University's Post UME Aptitude test before admission as well as their performance in a 100 level educational psychology course. The 222 students were sampled from 850 students admitted into the College of Agricultural and Science Education of the university in 2009/2010 session. The UME scores in percentage of maximum score obtainable were compared with the candidates' scores in the university Post UME screening / aptitude test that year and their scores in a first year educational psychology course using Pearson Product Moment Correlation coefficient and one – way analysis of variance (ANOVA). The result of the study shows a significant relationship between the candidates' scores in the three examinations at 0.05 level of probability. A one – way analysis of variance of the means of scores indicates significant difference in the mean scores, the highest being 100 level, followed by UME and lastly Post UME mean score. It can be said from the results that UME has predictive validity for performance in university.

Keywords: Measurement, intellect, test validity, Nigerian Youth.

INTRODUCTION

In a recent newspaper story, the Conference of Proprietors of Private Universities in Nigeria (CPPUN) identified government's failure to pursue excellence in education as the cause of universities poor ranking in Africa and the world. It was noted that the highest ranked Nigerian university, the University of Ilorin was in 55th position in Africa and 5846th position among 8000 universities featured in the world ranking. The same paper reported that Obafemi Awolowo University which used to be rated as the second best in Africa in the 1980s had dropped to the 61st (Alli, 2011). Has this deteriorating ranking of Nigerian universities anything to do with how

candidates are examined and admitted to the universities?

In educational systems all over the world, efforts are made to find out the intellectual capability of students for various purposes including placement in the next level. In Nigeria, we have always given primary school pupils in their final year the national and state common entrance examinations for admission into secondary school. Similarly at the end of secondary education, students take West African Examination Council (WAEC) and National Examination Council (NECO) senior secondary school certificate examinations for certification and Joint Admissions and Matriculation Board (JAMB) Universities Matriculation Examination (UME) for admission into tertiary institutions (Universities, Polytechnics and Colleges of Education). The main thrust of this research

*Corresponding Author E-mail: drdoigwue@yahoo.com

Table 1. Summary of 2009 UME (JAMB) Results Nationwide

Candidates who scored 200 and above	548,543
Candidates who scored between 190 and 199	14,847
Candidates who scored between 180 and 189	150,541
Candidates who scored between 170 and 179	128,063
Candidates who scored between 160 and 169	95,055
Candidates who scored less than 160	72,196

Source: http://www.informationnigeria.org/2009/04/jamb-nigeria-ume-2009-results-released_16.html. Retrieved 20/07/2011.

is to find out if students perform in universities as expected from their performance in JAMB UME and University Post UME screening tests using 100 level students in educational psychology course in University of Agriculture, Makurdi (UAM) as a case study.

In addition to certification of candidates, a major function of examinations such as WASSCE and NECO SSCE is to serve as entry requirements for admission into tertiary institutions. In the case of JAMB UME, it should be a search for identifying the learner's intellectual functioning and potential for higher education. How far does the examination perform this function? How far does it accurately predict how the candidates if admitted would perform in the University? This is the question this study set out to address, using 2009 JAMB UME results of candidates admitted to read Science Education in University of Agriculture, Makurdi in 2009/2010 session. The outcome of this study will add to the pool of knowledge that would aid university authorities to insist on post UME screening tests or not.

It would be recalled that JAMB Universities Matriculation Examination started in 1979 in line with Decree (Act) No 2 of 1978 (amended by Decree (Act) No 33 of 1989) (JAMB, 2011). The name of the examination was changed to Unified Tertiary Matriculation Examination (UTME) in 2010. 2009 examination was thus the last with the old name. The general performance of candidates in 2009 examination was as shown in Table 1. It can be seen from the table that only the number of candidates who scored 160 marks and above were indicated. This was because the cut – off point for admission to any university in Nigeria that year was 160. This cut – off score has been increased to 180 by 2011 as more and more candidates take the examination while the number of universities in the country has not increased so much in the same period. In fact, 1,009,245 candidates sat for the examination in 2009, 1,276,795 in 2010 and 1,493,604 in 2011.

Since inception of UME, the major criterion for admission into universities in Nigeria has been success in that examination. A candidate with a very high score in

the examination is therefore likely to be admitted into a university. However, a number of authors have expressed doubt as to the efficacy of using UME score as the major criterion for admission (Bamgboye, Ogunnowo, Badru, and Adewoye, 2001; Kale, 2004; Salahdeen and Murtala, 2005; Adeniyi, Araoye, Amali, Eru Ojabo and Alao, 2010; Ajala, 2010).

In some of these studies, Kale (2004) reported that the best performance at the first year university examination was achieved by students with lower UME scores. Similarly, Bamgboye et al (2001) as well as Salahdeen and Murtala (2005) found that UME score had no correlation with performance in the medical school. Interestingly, Adeniyi et al (2010) found that there was no correlation between UME score and 100 level results but rather with 200 level results in the first two years of medical school.

In the same vein, some lapses observed in the process of admission of candidates into universities in Nigeria through UME necessitated the call for an alternative method of admitting students into the nation's universities. This call eventually led to granting universities the power to conduct Post – UME – screening tests. Questions are already arising as to whether the screening tests will ensure quality and whether when the best students are admitted; there will be better quality of graduates produced by the universities, having in mind other factors that affect students' performance. Ajala (2010) has observed that events of the past three years of Post – UME – screening tests among Nigerian universities tend to cast doubt as to whether it is for academic excellence alone that the test was advocated or that financial gain is a reason for the advocacy.

Having seen all manner of doubts about the efficacy of UME scores as the major basis for admission into universities in Nigeria and the fears expressed about the Post – UME – screening tests, the issue of how their scores correlate to or predict the candidates performance in university becomes all the more imperative. Some of the efforts already referred to in this direction of research

need further investigation. It is in realization of this controversy that the researchers decided to carry out the study.

Purpose of the study

The purpose of the study was to determine the predictive validity of 2009 JAMB/UME in relation to the candidates' performance in University of Agriculture Makurdi Post – UME aptitude test as well as their performance in a 100 level educational psychology course after admission into the university.

Intellectual Functioning and Predictive Validity Defined Operationally

According to Coleman (2003), intellect refers to the faculty, power or capacity of reasoning and understanding as distinct from feeling and wishing. The term is used in general discourse for what in psychology is usually called "intelligence". As if to warn readers of the complexity of the concept of intelligence, Resnick (1976) pointed out that different definitions were suggested by 14 world's leading authorities in a psychology symposium in 1921. This paper is not about theories of intelligence. However, practical issues involved in the idea of intellectual functioning (intelligence) include abstract thinking, problem solving, planning capacity, attention, adaptability, educability or learning capacity, insight and grasping of relations (Resnick, 1976). To avoid the type of situation or dilemma portrayed by Resnick's observation above in this short paper, intellectual functioning should be seen as the cognitive ability of candidates as represented by scores obtained in the examinations or tests being compared in this research report.

The term validity, as used in measurement and evaluation, refers to the extent to which a test measures what it purports to measure (Tyler, 1973). The validity of a test or an examination can be viewed as the accuracy of specified inferences made from its scores. The main types of test validity are content validity, criterion – related validity and construct validity. There are two subclasses of criterion – related validity: predictive validity and concurrent validity. Of the two criterion – related validity, the more common is predictive validity, in which the test has the task of predicting some subsequent measure of performance. Thus, the predictive validity of a test or examination is a measure of how well its predictions agree with subsequent outcomes. In this study, predictive validity refers to the extent to which scores obtained in JAMB/UME are related to

success in the new level (university). The accuracy of prediction is represented by the correlation coefficient between the test scores in JAMB UME, Post UME test and performance in 100 level.

Research Design

This is an ex – post – facto research design. The researchers did not in any way have control on the examination scores used in the study.

Research Questions

To achieve the purpose of this study, the following questions were raised to guide the researchers in the collection and analysis of data.

1. How did the candidates admitted into 2009/2010 session Science Education degree courses of University of Agriculture Makurdi perform in (2009) JAMB/UME.
2. What scores did the candidates obtain in 2009 UAM Post UME aptitude test?
3. What scores did the candidates (as students) obtain in 2009/2010 100 level educational psychology course in UAM?
4. What is the relationship between the performance of the students in the above three examinations?

RESEARCH HYPOTHESES

Tested at 0.05 level of significance, the hypotheses for the study were:

1. There is no significant relationship between the performance of the students in JAMB UME, UAM Post UME test and Educational Psychology course.
2. There is no significant difference in the performance of the students in JAMB UME, UAM Post UME and 100 level Educational Psychology course.

Population of the Study

All students admitted into degree programmes in the College of Agricultural and Science Education of University of Agriculture, Makurdi, in 2009/2010 session formed the target population of the study. These students numbered 850. They were divided into eight (8) different options namely: Biology Education, Chemistry Education, Integrated Science Education, Physics Education, Mathematics/Computer Science Education, Mathematics/Statistics Education and Statistics/Computer Science Education degree options,

Table 2. Means and Standard Deviation of Students Scores in UME, Post UME and 100 Level Examinations

Examination	Mean Score (%)	Standard Deviation
UME	48.49	2.80
Post UME	48.31	7.47
100 Level	52.66	12.50

all domiciled in the Department of Science Education and Agricultural Education which is domiciled in the Department of Agricultural Education.

The Sample

Three (3) out of eight degree options were chosen by simple random sampling technique. 74 students from each of the options were then randomly sampled for inclusion in the study. Thus, scores of 222 students were obtained and formed the sample for the study.

Procedure

The scores of the candidates in 2009 JAMB/UME and Post UME before they were admitted and the scores obtained in Educational Psychology course coded EDU 102 in 2009/2010 session were obtained from the relevant departments of the university. These were then analysed to determine their relationship to one another.

ANALYSIS OF DATA

Each of the sets of scores viz: 2009 JAMB/UME scores in percentage of maximum score obtainable, the university Post UME scores of the candidates concerned and their scores in the educational psychology course coded EDU 102 in 2009/2010 session were analyzed for the means and standard deviation. The Pearson Product Moment Correlation coefficients for each pair of the sets were determined to find out the relationship between scores from the examinations. Lastly, the scores were subjected to one – way analysis of variance (ANOVA). Both the correlation coefficients and outcome of ANOVA were tested for significance at 0.05 level of probability.

RESULTS AND DISCUSSION

The summary of 2009 JAMB/UME results nationwide, the means and standard deviation of the candidates scores

in JAMB/UME, Post UME test and 100 level examinations as well as Pearson Product Moment Correlation coefficient of the candidates scores and report of one – way analysis of variance (ANOVA) of JAMB/UME, Post UME test and 100 level scores are presented in Tables 1 – 4 respectively.

From Table 2, it can be seen that though the means of scores for all three examinations are quite close to each other (48.49, 48.31 and 52.66), there is a wide disparity in the standard deviations (2.80, 7.47 and 12.50) respectively. As an index of dispersion, the standard deviations show that scores for the Post UME test of the candidates are more scattered than the JAMB/UME scores for the same group of candidates. The scores for performance in 100 level educational psychology course are even more scattered than those for Post UME test.

The disparity in the values of standard deviation of the scores may be related to certain characteristics of the examinations such as their internal consistency and content validity. Of course, out of these three tests, educational psychology content would appear to contrast sharply to the JAMB/UME and UAM Post UME tests. From what the researchers know about these examinations, the UME and Post UME tests are based on four different subject-areas such as English, Biology, Chemistry and Physics or Mathematics. The exact combination of subjects taken by the candidates was not known.

In Table 3, the relationship between JAMB/UME scores and the university Post UME aptitude test scores is very high (0.91). This was found to be significant at 0.05 level of probability. This significant relationship suggests that both JAMB UME and UAM Post UME screening test may be measuring a certain trait of the candidates probably the general intellect of the candidates. Ojerinde (2008) has identified possible factors measured by JAMB for science students as physical, numerical, organic and biochemical, based on factor (loading) analysis of scores.

From Table 3 also, it can be seen that there is high correlation between UME and 100 level scores (0.87) and between Post UME and 100 level scores (0.81). These relationships are both significant at 0.05 level of probability. The finding of significant relationship between

Table 3. Pearson Product Moment Correlation Coefficients of Student Scores

Correlated Scores	Coefficient (r)	Std Error (σ)	t-obtained	t-critical	p	Decision
UME vs Post UME	0.91	0.065	13.86	1.96	<0.05	Sig.
UME vs 100 Level	0.87	0.065	13.38	1.96	<0.05	Sig.
Post UME vs 100 Level	0.81	0.065	12.46	1.96	<0.05	Sig.

Table 4. Report of ANOVA of UME, Post UME and 100 Level Scores

Source of Variation	df	Sum of Squares (ss)	Mean of Squares (ms)	F. Cal.	F. Crit.	p
Between Groups	2	2701.64	1350.82	18.36	3.02	<0.05*
Within Groups	666	49013.47	73.59			
Total	668	51715.11				

*Decision: Null Hypothesis rejected

UME and 100 level scores is primarily different from the finding of Adeniyi et al (2010) that there is no correlation between UME scores and 100 level results in the medical school but agrees with their findings for 200 level students.

Table 4 shows the report of one – way analysis of variance (ANOVA) of UME, Post UME and 100 level scores of candidates. Since the calculated F – ratio (18.36) is more than the critical (3.02), the null – hypothesis that there is no significant difference in the mean UME, Post UME and 100 level scores is rejected. In other words, the result shows that there is significant difference at 0.05 level of probability of the mean scores obtained in UME, Post UME and 100 level tests.

Although there is a high positive correlation between the scores there is significant difference in the mean scores in favour of 100 level performances when compared with UME and Post UME scores. This could be as a result of different subject areas covered by the tests. Since the students performed at 100 level well above the UME score it can be said that UME has predictive validity as the ultimate aim of UME is to select the best students for university admission based on their scores.

CONCLUSION AND RECOMMENDATION

The idea of a unified examination for measuring the intellectual functioning of Nigerian youth for admissions into tertiary institutions is a plausible one. Some doubts have been expressed about the efficacy of the scores

obtained in these JAMB examinations over the years especially in relation to performance in university.

However, no much evidence for these doubts has been provided by relevant research except a few case studies which lack much generalisation. In the present study, a significant relationship was found between JAMB UME scores and students' performance in 100 level educational psychology course. There was significant difference found between the mean scores when subjected to analysis of variance. It can be said from results of this study that UME has predictive validity for students' performance in university. There is need for a lot more study on this matter. However, it is the recommendation of the authors that JAMB should be accorded the benefit of any doubt about the efficacy of its examination scores in relation to performance of the candidates in university until clearly proved otherwise.

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