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Remote Emotional Quotient Assessment of UTME candidates as Alternative to PUTME Screening in Nigerian Institutions of Higher Learning.

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Abstract-
This study proposes a test of Emotional Quotient (EQ) of Unified Tertiary Matriculation Examination(UTME) candidates by Universities they have applied to, as an alternative to duplicate Intelligent Quotient test (Post UTME) presently practiced. The proposed assessment system was tested by designing a questionnaire that asks EQ questions and uses students' responses on whether they gained Merit or Supplementary admission and tagged academic ability. EQ ordinal questions were summed and transformed into categorical questions that are used to derive interaction with independent variables. Performance of EQ as Dependent, while demographic information was used as Independent variable, was derived using classification tree. Similarly, association with students' admission type as the dependent variable while EQ items and demographic data is independent variable was also derived. The result of Classification Tree with CHAID algorithm returns Study Type as variable with the highest priority to the dependent variable, with a p-value of 0.000 and Chi-Square of 26.203. Age and EQ items were also shown to have statistical significance with Age having a p-value of 0.000 and Chi-Square of 27.251. Older participants have higher Merit admission than Supplementary admission. EQ item with ability characteristic was captured in node 3 alongside age. Participants who Agree to this item have higher Merit admission than those who do not. Alternative Hypothesis is accepted and Null hypothesis rejected. Performance prediction using Admission Type returned overall 76.5% accuracy while prediction using EQ and dependent variable while other demographics were input ad independent variables returned 68.8% performance accuracy. Also, the choice of Mixed Model for Testing EQ seems to be ideal since the performance of both types (68.8% for Self-Report and 75.5% for Ability) and not too far apart. The researcher, therefore, recommends the use of Previous works (Results) as well as Remote Emotional Assessment System (REAS) as an alternative to PUTME.

Keywords: *Classification Tree, Likert scale analysis, EQ Models, Assessment PUTME, UTME, JAMB, University, Admission, Emotional Quotient, Intelligent Quotient.*

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I. Introduction

Assessment of candidates for admission into Nigerian Higher institutions is a responsibility invested on Joint Admission and Matriculation Board (JAMB). The assessment Unified Tertiary Matriculation Examination required candidates to write examinations in three core subjects of their chosen discipline and English. The process of this assessment, however, was ridden with flaws such as impersonation, malpractice, and special centers set up to perpetrate various malpractice activities, and that made stakeholders query the integrity of the assessment. Following this, institutions of higher learning started a follow-up assessment tagged Post UTME which tested the candidates in the same subjects as the UTME. Recent efforts of the assessment body (JAMB) to improve the integrity of assessment led to change of examination pattern from paper and pen to Computer-Based Test (CBT), use of surveillance cameras, biometric identification of candidates, and National Identity Number inclusion. Despite these checks, the universities have continued with IQ assessment of candidates in the same pattern as JAMB. This study proposes a test of the Emotional Quotient of candidates as an alternative to Post UTME. Many researchers such as Eva K. et al (2015) worked on finding the effect EQ has on various academics-related independent variables, with the parametric statistical test being the most commonly applied method. Literature supports this method on grounds of successful test of normality and robust nature of statistical methods. In this study, the researcher adopted a nonparametric statistical test (Classification tree). The proposed test is conducted by generating an online questionnaire, with questions aimed at ascertaining the psychological status of the candidates. The students self-report their experiences, and the data features are analyzed to gain insight required to build an EQ Assessment System that will replace the present Post UTME IQ

test. Three existing EQ models were x-rayed: Ability EQ model (Mayer et al (2002)), Trait model (Petrides, K. V., & Furnham, A. (2003)), and Mixed model (Bar-On, R. (2006)).

II. Literature Review

2.1 Intelligence Quotient

Ellen & Dennis (2006) describes Intelligence quotient as a standard method of measuring human intelligence through sum of numeric scores. Many definitions of this term exist, some it being a measure of complex cognition (Ken & Sarah (2014), while others describe it as a measure of social class background Ken (2002). Original meaning of Intelligence Quotient is, a score obtained from evaluation of one's intelligence and then divided by his /her chronological age to get a fraction, multiplying the fraction by 100 gives the quotient sort. Modern method involves using a mean of 100 and Standard deviation of 15 to transform test score.

2.2 Emotional Quotient

According to Mayer et al (2004) Emotional Intelligence is the way a person handle's his or her emotions. This can be evaluated through various existing models. While some of the models (Trait model (Petrides, K. V., & Furnham, A. (2003)), and Mixed model (Bar-On, R. (2006)) recommend full self-report or combination of self-report and ability test, others, such as Ability EQ model (Mayer et al (2002)) belief one cannot judge himself without bias. Hence advocating for a test of one's ability in order to ascertain his emotional Intelligence. Mayer et al (2004) observes that perception, and regulation of emotion are keypoints of emotional intelligence.

2.3 Nigerian University Commission

2.4 Requirements for University Admission

2.5 JAMB

JAMB is the body charged with the responsibility of assessing candidates for admission into institutions of higher learning in Nigeria. The body is established by an Act of 1978 which was amended in 1988 and 1993 (Media Nigeria blog, 2018). The board has the responsibilities of conducting examinations into all higher institutions in Nigeria: Universities. Polytechnics and colleges of education. The however, must collaborate with the institutions in placement of qualified candidates.

2.6 Theoretical Framework

Three existing Emotional Intelligence models were reviewed in this work: Ability model, Bar-On Model and Trait model. Just like Intelligence Quotient, Emotional Quotient level is attached to a score of EI transformed to a quotient score.

Ability EQ model evaluates use of mental ability, and its correlation with other intelligent forms which develop over age. Trait EQ models evaluates Emotional Intelligence from a group of self-perceived scores on one's personality trait, while the Mixed EQ models strikes a balance between Ability EQ features and Trait EQ features. Literature shows that self-reporting EQ is not a standard method of evaluating true emotions, as individuals are bound to give misleading information. However, many measurement scales using self- reported EQ exist. Ajaji & Somefun (2020) used self-report method to find the frequency of drug use among Nigerian undergraduates, Maria-Jose et al (2012) used Trait EQ model to find the link between Emotional quotient and university performance. Adel & Mahd (2010) used Bar-on EQ Model to collect data for predicting the role of EQ for predicting Academic performance of students in distance

III. Methodology

3.1 Research Purpose and Model Definition

The purpose of the study is to propose an alternative assessment for candidates who successfully pass through the examinations by JAMB, considering that the examining body collaborates with institutions in the placement of candidates. The proposed model suggests the use of Remote Emotion Assessment (REAS), which is in line with recent trend of problem solving with the use of mobile phones and related social media technology (Olebara, 2022). where the candidates receive online survey that asks them to self-report emotional experiences that border on abuse, perception, self-worth, and reaction towards others. Questionnaire should follow close-ended Likert scale, and its analysis method should be Classification and Regression Tree.

3.2 Study Area

Undergraduates of Imo state university were identified as participants for the pilot study. Students from various Faculties and Departments were captured in the study.

3.3 Research Instrument and Method

Data should be remotely collected through a questionnaire. In this pilot study, a questionnaire was designed using google scholar. Close-ended Likert questions were presented. Self-report Emotional experiences were captured and analyzed with respect to students' qualification for merit admission or Supplementary admission.

3.4 Research Question

Does Emotional Quotient of student affect their academic performance

3.5 Hypothesis

H1: Students' Emotional Quotient is a predictor of the Academic performance

3.6 Data Analysis

Demographic data obtained from descriptive statistics shows that a total of 324 responses were received out of which 216 were male (66.7%) and 108 accounting for 33.3% were female. Age demography shows that 12 participants between the age of 16 to 18 (3.7%) participated, those between 19-21 were 142(43.8%) while those between 22and above were 170 accounting for 52.5%. On study fields captured, 178 participants in Faculty of Science (54.9%), 12 in Law (3.7%), 126 from Faculty of Humanities (38.9%), and 8 from Social Science (2.5%). On Dependent variable "Admission Type", 93 students (28.7%) were found to have gained admission through Supplementary admission while 231 (71.3%) gained admission on merit. This information was deduced from their answer to: which department they applied to, and which department they were given. Table 1 shows the Socio-demographic information of the study.

Considering the method of data collection, which was through close-ended Likert scale questions, the researcher first tested for assumption of normality (for parametric test to be run) to which the data failed. Non parametric statistical test was therefore adopted. Classification Tree, which is a non-parametric test for modelling different scenarios to observe statistical significance as well as association between them. Table 2 is the output display of classification of Dependent variable "Admission Types on all Independent variables analyzed. Classification Tree algorithm adopted is CHAID.

Table 1: Socio-Demographic Characteristics of Participants

Variable	Frequency	Percentage
Gender		
Female	216	66.7
Male	108	33.3
Age (years)		
16-18	12	13.7
19-21	142	43.8
22 >	170	52.5
Study Field		
Science	178	54.9
Law	12	3.7
Arts	126	38.9
Social Science	8	2.5
Below 18	269	67.9
	124	31.3
Admission Type		
Merit	93	28.7
Supplementary	231	71.3

1) Testing of Hypothesis

H1: Students' Emotional Quotient is a predictor of the Academic Ability.

To test if Emotional Quotient (an output of Emotional Intelligent) can accurately predict the ability of a student to perform expected functions and successfully complete studied, the researcher adopted the students' JAMB result. Answer to the question: if they were admitted into the departments they applied to, gave information on whether they got Merit of Supplementary.

Dependent variable = Admission Type which is a categorical data, while all other questions and demographic information were Independent variables. Running the Dependent variable through Classification and Regression Tree (CART) produced the Decision Tree in Figure 1 below. CART uses CHAID Algorithm

which is acronym for Chi Square Automatic Interaction Detection, hence the Decision Tree outputs relationships as well as level of significance.

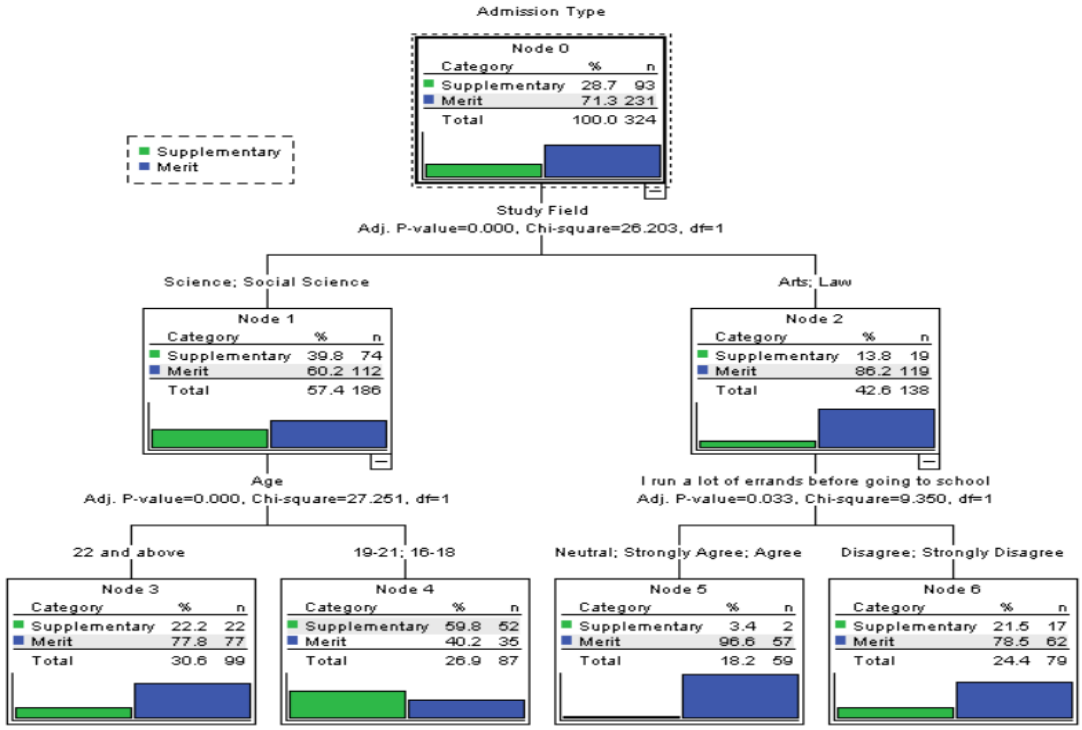

Figure 1: Classification And Regression Tree (Using CHAID Algorithm). Source: SPSS output

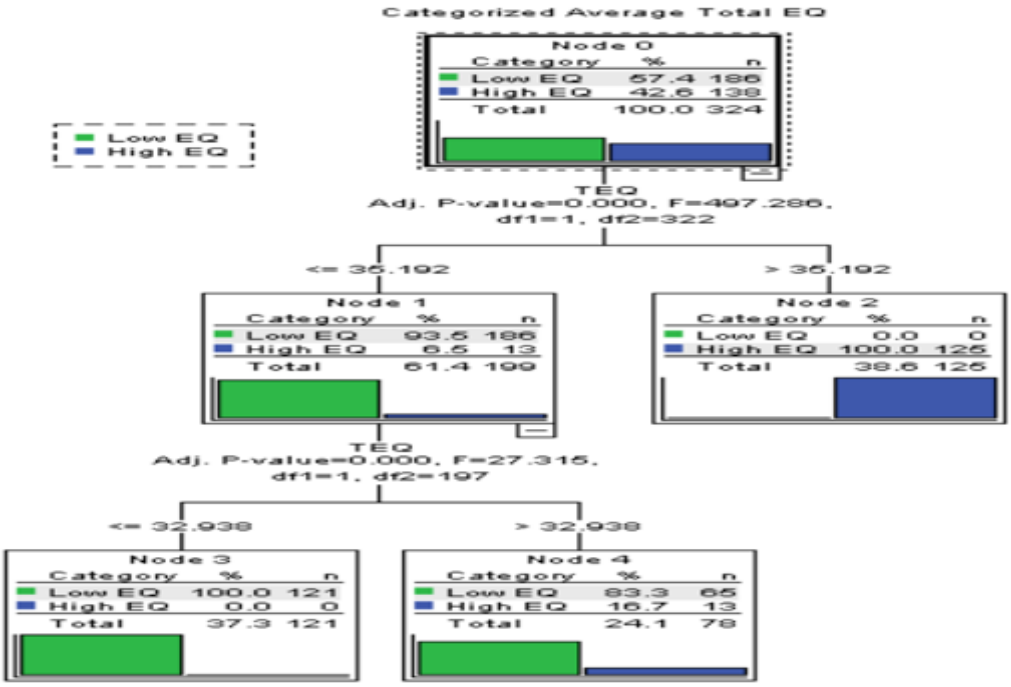

Figure 2 classification regression tree on EQ. Source: SPSS output

Table 2: Dependent and Independent variables entered in Classification Tree.

Specifications	Growing Method	CHAID
	Dependent Variable	Admission Type
	Independent Variables	C, Age, Gender, Study Field, I have lived with my parents while in primary and Secondary schools, I lived with other relatives while in Primary and Secondary schools, I run a lot of errands before going to school, I felt mal treated while growing up, I often felt bullied by others., I am easily hurt by negative remarks, I like to get back at people who hurt me., I think about my mood constantly., When I'm angry, I usually let myself feel that way., My powers of intuition are quite good when it comes to understanding otherâ €™s emotions and motives., I do not know how my actions will make others feel., I have often hurt others without realizing it., I readily apologize to others when I realize that I have hurt them, There is need for another CBT(PUTME) assessment after UTME, Emotion(EQ) of UTME candidates should be assessed before admitting them into University, Combination of IQ(UTME) and EQ(University based Emotional Quotient assessment) should be used as alternative to IQ(UTME) and IQ(PUTME), TEQS, TEQO, TEQ, ATEQ, 1. Have you applied for tertiary institution admission before(Admission success)
	Validation	None
	Maximum Tree Depth	3
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	Study Field, Age, I run a lot of errands before going to school
	Number of Nodes	7
	Number of Terminal Nodes	4
	Depth	2

Table 3: Performance Accuracy Of Admission Type. Source: SPSS output

Classification

Observed	Predicted		
	Supplementary	Merit	Percent Correct
Supplementary	52	41	55.9%
Merit	35	196	84.8%
Overall Percentage	26.9%	73.1%	76.5%

Growing Method: EXHAUSTIVE CHAID
Dependent Variable: Admission Type

Table 4: Performance Accuracy Of EQ on . Source: SPSS output

Classification

Observed	Predicted		
	Low EQ	High EQ	Percent Correct
Low EQ	133	53	71.5%
High EQ	48	90	65.2%
Overall Percentage	55.9%	44.1%	68.8%

Growing Method: CHAID
Dependent Variable: Categorized Average Total EQ

3.7 Result Interpretation

CHAID algorithm returns variable with highest priority to dependent variable and the show to be Study Type, with p-value of 0.000 and Chi-Square of 26.203. Age and EQ item "I run alot of errands before school" showed up at the Tree's third node. Age has a p-value of 0.000 and Chi Square of 27.251. Participants that are 22 and above have higher merit admission of 77.8% when compared with those in age categories of 16-18 and 19-21 which has 59.8% Supplementary admission. This means that age (maturity level plays a role on the emotional intelligence of participants.

Thirdly, EQ item "I run a lot of errands before going to school was captured in node 3 alongside age. Participants who Agree to this item have 96.6% merit admission as opposed to 75.5% merit in people who disagree.

Age and Measurable Emotional Intelligence predict academic ability as represented Merit and Supplementary Admission. This agrees with Mayer et al (2002) Ability model which observes that EQ is a measurable characteristic based on previous actions and that self-report alone is neither sufficient or reliable. Alternative Hypothesis is accepted and Null hypothesis rejected. Performance prediction using Admission Type returned overall 76.5% accuracy while prediction using EQ and dependent variable while other demographics were input ad independent variables returned 68.8% performance accuracy.

IV. Conclusion and Recommendation

The study is used to proposes a new assessment method for higher institutions, as an alternative to PUTME. this method revealed that statistical significance between Emotional Intelligence and Study field, age, and how hard one worked as a child. Other Emotional Intelligence variables were not considered important by the algorithm hence they were not presented on the decision tree. We therefore conclude that, although emotional Intelligence may not contribute directly to predicting academic success, it will provide vital information on the emotional stability of the candidate as well as help the university plan towards reducing drug use amongst undergraduates. The use of Remote Emotional Assessment (REAS) will guarantee privacy that would enable participants give sincere self-report.

The researcher recommends inclusion of sessional Remote Assessment of undergraduate Emotional Intelligence. The remote assessment will consist of self-reported survey and survey should consist of questions that bother on students' challenges, drug exposure, Cultism exposure. Analysis of such data should be carried out using Non parametric statistical test such as Classification And Regression Test (CART). The result would show association.

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