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HEALTH EDUCATION ACHIEVEMENT TEST

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HEALTH EDUCATION ACHIEVEMENT TEST (HEAT) FOR BASIC LITERACY EDUCATION IN ANAMBRA STATE

Uche J. Obidiegwu

Abstract

This study developed and validated a diagnostic health education achievement test for adult learners in Anambra State. Two research questions and a research hypothesis guided the study. The instrument was pretested. Following the result of the pilot test, a total of 96 multiple choice test items were administered to 1,342 adult learners. The analysis of the data was carried out using item analysis. Kuder-Richardson formula ‘21’ was used to determine the internal consistency of the instrument. Finally, t-test was used to test the hypothesis. Based on the results, some recommendations were made.

Introduction

Any meaningful learning transaction should relate to the level to which the learning purposes or intended learning objectives are accomplished (Okeke 1992). It has been observed that most of the decisions which an educator makes in the learning situation are among the possible ways of improving the learner’s achievement. The educator guides the instructional activities of the classroom and finally makes provision for assessing learners’ achievement. Ezeife (1993) adduced that any effective and meaningful curriculum must be relevant to the needs, interest and expectations of the learner. If behavioural changes in learner have to take place assessment becomes necessary. According to Folayan (1982) assessment could be done through quizzes, examination, interviews and projects. It is the work of an educator to guide the instructional activities of the classroom and finally make provision for assessing learner’s achievement. According to Onyekuba, (2004) achievements tests are used to measure the extent of academic knowledge, skill and competencies which learners have acquired as a result of exposure to certain learning experiences and contents.

In realization of the importance of assessment for curriculum development, Nigerian national policy on education lays more emphasis on continuous assessment at all levels of education (NPE, 2004). Apart from reading, writing and computation for adult learners in basic literacy education, health education is next in importance to adult learners. This is because the learners are not learning only to acquire knowledge in order to pass examination; they need ideas and knowledge that will be of paramount impact in their lives as individuals and members of their societies (UNESCO, 1990). It is only when an adult learner have knowledge on how to
promote his health that he can meet the increasing health challenges of the present era.

According to Garba (1993), teaching that is objective is the teaching that seeks to bring about changes in the learners to a definite direction; such direction can help learners to develop and demonstrate competence in tasks which they are expected to perform. According to Okeke (2004), false assessment gives room to false and unrealistic result and as noted by him when the parameter for assessment is subjective the result becomes ridiculous.

As noted by Dosunmu (2002), Alele-Williams (2002), Baker (2003) and Obioma (1985) most teacher-made tests lack validity and reliability. In their various explanations, they indicated that most teachers seem to lack test-construction skill. Adult educators as facilitators of adult learning are not left out in this handicap (Obidiegwu, 2008). Success of assessment procedure in adult learning is dependent on the educator’s ability to develop valid and reliable instruments which could generate desirable and positive effects on the learners. Tests and test results are very vital in education (NPE 2004, Nworgu 1985), this is because they show the extent of mastery of skills as well as help to identify the variability among learners (Thorndike and Hagen 1977). Achievement test could be used to forecast success (Obioma, 1987) as well as aid an educator to review instructional contents and methods. It is therefore necessary to help educators to learn standard way of test development or provide for them ready-made test instruments which they can use in part or whole to assess their learners. Thus the study sought to develop and standardize an instrument for assessing adult learners in health education.

Research questions

1. What are the psychometric properties of the health education achievement test instrument (HEAT)?
2. Using Kuder-Richardson formula ‘21’, how reliable is the HEAT?

Hypothesis

There will be no significant difference in the mean ratings of male and female adult learners with respect to their achievement in HEAT

Methodology

Research Design

The study used instrumentation research design. It is geared towards development and validation of an instrument. This study developed a standardized test for assessing the achievement as well as diagnosing achievement deficiencies of adult learners in health education.
Area of the Study

The areas used for the study is Anambra State. The study covered all the six education zones in Anambra State of Nigeria namely: Nnewi, Aguata, Onitsah, Otuocha, Ogidi, Awka. The number of adult learners in the zones are 139, 273, 175, 450, 119 and 186 respectively as at 2006/2007 session.

Population of the Study

The entire adult learners in primary six in public owned adult basic education centers in Anambra State comprised the population of the study. Sampling was not done.

Instrumentation

The instrument used for data collection was the HEAT. It comprised of 96 items which covered the course contents of senior basic primary education (primary 4-6). The items were multiple choice objective test items and were based on five broad content areas of the syllabus put together by the researcher and some experts in health education for better management and handling as shown below:

i. Personal hygiene
ii. Food, nutrition and consumer health
iii. Safety, prevention and control of diseases
iv. Home, school, alcohol and drugs
v. Mental health, body and how it works

Test Blue-Print

A test-blue print which specified the level of objectives as they related to the content of health education taught to the adult learners was developed by the researcher. The test blue print ensures valid measures of achievement and prevents construction of biased test.

Validation of the Instrument

The researcher developed 96 multiple choice test items. The face and content validation of the test items were conducted by experts in health education, measurement and evaluation, adult education and technical education. The validators were requested to indicate the relevance of the items to their content areas as well as appropriates (in terms of difficulty) of each item to the class level.

Pilot test

The instrument was pilot tested with a sample of 26 adult learners in 15 private literacy centers in Anambra State who were not involved in the study.
Method of Data Analysis

Item analysis was carried out using the upper and lower 27% of the sample

i. Item difficulty (D) \[ \frac{U+L}{N} \]

Where U = Number of subjects in the upper criterion group that got the item correct
L = Number of candidates in the lower group who answered the item right
N = Number of candidates in the lower group who answered the item right

ii. Discrimination Index (R) \[ \frac{RU+RL}{\frac{1}{2} N} \]

Where U = Number of candidates in the upper group who answered the item right
L = Number of candidates in the lower group who answered the item right
\( \frac{1}{2} N \) = Half of the number of candidate in both the upper and lower group

(iii)

Distractor index (DI) = \[ \frac{U-L}{N} \]

Where the symbols retain their meaning in i and ii above.

Reliability Analysis

The reliability of the Health Education Achievement Test (HEAT) was computed using Kuder-Richardson formula 21 thus K-R 21 = \[ \frac{n}{n-1} (1 - mt \left( \frac{n-1}{n} \right)^{\frac{1}{2}} \) \]

Ogbazi and Okpala (1994)

Results

Research Question 1

The result of the study are presented according to research questions and hypothesis

Research question 1
What are the psychometric properties of health education achievement test instrument (HEAT)?

Research question one sought for the measurement of the psychometric characteristics of the HEAT items namely: difficulty, discrimination and distractor indices. The data relevant for answering research question one is presented in Table ‘1’

Table 1

<table>
<thead>
<tr>
<th>Difficulty, Discrimination and Distractor Indices of HEAT Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Good</strong></td>
</tr>
<tr>
<td>Difficulty</td>
</tr>
<tr>
<td>Index</td>
</tr>
<tr>
<td>86.46</td>
</tr>
<tr>
<td><strong>Good</strong></td>
</tr>
<tr>
<td>Discrimination</td>
</tr>
<tr>
<td>Index</td>
</tr>
<tr>
<td>89.58</td>
</tr>
</tbody>
</table>

**Distractor Analysis**

<table>
<thead>
<tr>
<th>HEAT Items</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of items</td>
<td>96</td>
</tr>
<tr>
<td>Number with effective distractors</td>
<td>87</td>
</tr>
<tr>
<td>Number with neutral distractors and ineffective distractors</td>
<td>11</td>
</tr>
<tr>
<td>Number without neutral and ineffective distractors</td>
<td>85</td>
</tr>
</tbody>
</table>

Table ‘1’ shows that 83 of HEAT items had good or suitable difficulty indices the items fell within acceptable range of 0.30-0.70, eight items have high difficulty indices, while five items have low difficulty indices.

It was shown that 86 items has good discrimination indices. The items discriminated between high ability candidates and low ability candidates, six items has low discrimination indices and four items has negative discrimination indices.

Table 2, on the distractor index analysis, shows that HEAT has 96 items, 87 items (90.63%) has effective distractors, 11 (11.46%) items has neutral and ineffective distractors and 85 items has no neutral and ineffective distractors.

**Research Question II**

Using Kuder-Richardson formula ‘21’ how reliable is the instrument (HEAT)?
Table 3:

Mean, Standard Deviation (SD) and Reliability Co-efficient of the HEAT

<table>
<thead>
<tr>
<th>Mean</th>
<th>SD</th>
<th>Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>16.02</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Kuder-Richardson formula ‘21’ was used to calculate the reliability co-efficient of the instrument. As shown in Table ‘3’ the mean score of the HEAT instrument is 78, standard deviation 16.02 and reliability co-efficient 0.87. The reliability estimate of the five content areas namely: personal hygiene, food nutrition and consumer health, safety, prevention and control of diseases, home, school, alcohol and drugs, mental health, body and how it works were 0.80, 0.85, 0.87, 0.89 and 0.81 respectively.

**Hypothesis**

There will be no significant difference in the mean rating of male and female adult learners with respect to their achievement in HEAT.

Table 4:

Mean, Standard, Deviation (SD) and T-test Analysis of the Male and Female Adult Learners

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>Df</th>
<th>t-cal</th>
<th>t-crit</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>25.21</td>
<td>5.41</td>
<td>451</td>
<td>1340</td>
<td>2.34</td>
<td>1.96</td>
<td>Rejected</td>
</tr>
<tr>
<td>Female</td>
<td>20.06</td>
<td>6.71</td>
<td>891</td>
<td></td>
<td></td>
<td></td>
<td>H₀¹</td>
</tr>
</tbody>
</table>

Table ‘4’ shows that male adult learners had a higher mean achievement score of 25.21 with a standard deviation of 5.41 than their female counterparts who recorded a mean achievement score of 20.06 with a standard deviation of 6.71. Table ‘4’ also shows that the calculated t-value of 2.34 is greater than critical t-value of 1.96 for 1340 degrees of freedom at 0.05 level of significance, the null hypothesis is thus rejected. This means that a significant difference existed between mean achievement scores of the male and female adult learners as measured by the HEAT.

**Recommendations and Conclusion**

Based on the results of this study, a health education achievement test (HEAT) based on the curriculum of senior primary schools has been developed and validated using adult learners in primary six in Anambra state.
HEAT is a valid and reliable instrument for assessing adult learners’ education. It could be used to monitor learning progress during instruction and determine the extent to which instructional objectives have been achieved. Group or individual remedial work can therefore be prescribed.

The health education teachers could use HEAT as a model test for developing their own tests especially for other classes. Future researchers could also use HEAT as a reference point in constructing valid and reliable test items for assessment of learners.

Test should be constructed to involve areas of affective and psychomotor domains. This will help to determine the extent of students’ achievement and update their knowledge in different subject areas.

Workshop, seminars and in-service training programmes should regularly be organized for educators on test construction and item writing rules so that they can be able to write valid and reliable tests and items.

References


Education held at Kaduna Polytechnic, Kaduna.

Garba, N.L (1993). *Development and validation of instrument for woodworking*
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