

DEVELOPMENT AND VALIDATION OF PHYSICAL EDUCATION ACHIEVEMENT TEST (PEAT) FOR ADULT LEARNERS IN ANAMBRA STATE

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Abstract

This study sought to develop and validate a Physical Education Achievement Test (PEAT) which will be used for accurate assessment of adult learners in basic education. Eight items were developed, pilot tested, validation and reliability determined using Kuder-Richardson formula '21'. Based on the results some recommendations were made.

Introduction

The extent to which learning purposes or intended learning outcomes are achieved should be of great interest to any curriculum developer (Tyler, 1949; Mkpa, 1986; Ekpendu, 1987). Most decisions and efforts made by educators are on the possible ways of improving students' achievement. In order to determine the extent of learners' achievement in all domains, assessment is very necessary. This could be seen in the interest of the National Policy on Education (NPE) in the continuous assessment which is supposed to be implemented at all levels of the educational system for both adult and young learners (NPE 2004). The West African Examination Council in 1992 noted that one of the major constraints in achieving its objectives, were founded on the inability of teachers to develop the desired test items necessary for assessing the learners. According to Ubani (1991), the performance of learners depends to a large extent on the quality of training received by teachers in test constraint. It is very necessary that educators should develop valid and reliable instruments which they will use in assessment of the learners (Okeke, 1992). However, most educators lack test construction skill, standardized instrument do not also exist in good number for assessing adult and young learners.

The national policy on Education of 2004, emphasized physical and health education, at all levels of education system. Physical education gives to a learner physical satisfaction of movements of various qualities and mental satisfaction of creative activity. It enables an individual to bring all activities feelings of interests' efficiency, determination and happiness (Amuchie 2003).

Development and validating achievement test for adult learners in physical education is necessary in order to diagnose areas of deficiencies of the learners, when these areas are identified, appropriate and remedial steps would be taken towards solutions of their problems. The problem of the study is therefore, that of developing a valid and reliable instrument for assessing the achievement of adult learners in physical education.

Research Questions

1. How valid is the physical education achievement test (PEAT) with reference to item analysis namely: Discrimination and Distractor indices?
2. Using Kuder-Richardson formula '21' how reliable is PEAT.

Research Design

The study is an instrument development study. It involved development and validation of an instrument in physical education for assessing adult learners in basic literacy education.

Area of the Study

The area of the study is Anambra State. It covers the six education zones namely: Awka, Ogidi, otuocha, Onitsha, Aguata and nnewi. The education zones have 186, 119, 450, 175, 273, 139 adult learners respectively as at 2006.

Population of the Study

The population of the study comprised of primary six adult learners in public owned adult basic education centre in Anambra State. The total number was 1,342. No sampling was done.

Description of the Instrument

The instrument used for data collection was the PEAT. It has multiple choice objective test items in all levels of the cognitive domain. The items of the instrument covered the entire senior primary curriculum of the adult learners. The researcher put together the topics into five broad content areas as shown below:

- Topic A: Movement, Posture and Rhythmic activities
- Topic B: Athletics (Track and Field)
- Topic C: Major games
- Topic D: Simple Games and Recreational Activities
- Topic E: Gymnastic, Aquatic and Combative Sports

Test Blue-Print

A detailed table of specification was used to specify the level of objectives as they relate to the content of physical education for adult learners. Test blue-print was used to build content validity into the test and accordingly prevented the construction of test which was biased.

Validation of the Instrument

The researcher developed 80 multiple choice objective test items. The face and content validation of the test items were conducted by experts in measurement and evaluation, health education, adult education and technical education. Their recommendations in terms of levels of difficulty of each item, clarity of words and plausibility of the distractors were strictly adhered to.

Pilot Test

The instrument was pilot tested with a sample of 24 adult learners in primary six in 10 private literacy centres in Anambra State who were not involved in the study. This was done to determine whether further refinement in the items was necessary and to establish initial reliability of the instrument.

Method of Data Analysis

The scores of the adult learners in the test formed the data for analysis. The analyses were carried out using the upper and lower 27 percent 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 subjects in the lower criterion group that got the item correct

N = Number of subjects in the upper and lower criterion group

(ii) Discrimination Index (R) = $\frac{RU-RL}{1/2N}$

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

$1/2N$ = Half of the number of candidates 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 PEAT was computed using Kuder-Richardson

Formula '21' thus K-R 21 = n

$$\frac{n - \sum (I - mt)^2}{S^2}$$

(Ogbazi and Okpala 1994)

Presentation, Analysis of Data and Interpretation of Result

The data which were collected by administering the instrument (PEAT), were presented

according to the research questions.

Research Question I

How valid is the physical education achievement test (PEAT), with reference to item Analysis namely: Difficulty, Discrimination and Distractor Indices.

Research Question T sought for the measurement of the difficulty, discrimination and distractor indices of the PEAT items. The data relevant for answering the research question '!' is presented in Table 1.

Table I: Difficulty, discrimination and Distractor indices of PEAT items

	Good	High	Low	Total
Difficulty Index	0.30-0.70 73Nos (91.25%)	0.71-1.00 4 Nos 15.00%L -	0.00-0.29 3 Nos (3.75%)	80(100%)
	Good	Low	Negative	Total
Discrimination Index	0.30-0.00 71 Nos (88.75%)	0.00-0.29 6 Nos (7.50%)	-1-0.00 3 Nos (8.75%)	80 (100%)

Distractor Analysis	PEAT	Percentage Representation
Number of items	80	100
Numbers with effective distractors	73	91.25
Numbers with neutral distractors and Effective distractors	9	11.25
Numbers without neutral and ineffective Distractors	71	88.75

Tables T, indicates that 73 items of the PEAT were found to have good difficulty indices because they fell within the acceptable range of 0.30-0.70. Four items have high difficulty indices while three items have low difficulty indices.

Discrimination index analysis shows that 71 items are good i.e. they discriminated highly, six items have low discrimination indices while three items have negative discrimination indices.

Distractor index analyses shows that PEAT has 80 items, 73 items have effective distractors., nine items were found to have ineffective and neutral distractors, while 71 items were without neutral and ineffective distractors. The PEAT items certified were suitable for use in evaluating adult learner's achievement in physical education.

How Reliable is the PEAT?

The mean, standard deviation and reliability co-efficient of the PEAT computed using Kuder-Richardson formular '21' is as shown below:

Table 2: Mean, standard Deviation (SD) and Reliability co-efficient of the PEAT _____

Mean	Standard Deviation
81	15.31

**Reliability
co-efficient 0.89**

The reliability co-efficient of the 80 items of the PEAT was 0.89 while the unit reliability estimate was 0.31. The reliability estimate of the five content areas namely: Movement, posture and rhythmic activities; athletics; major games; simple games and recreation activities; gymnastic, aquatic and combative sports were 0.86, 0.84, 0.81, 0.89 and 0.86 respectively. Grunlund and Linn (1984),

noted that measures of stability in the 80's and 90's are commonly reported for standardized tests of aptitude and achievement. Wolansky (1985), also stated that the acceptable reliability of critically refined test is generally in the range of 0.80 to 0.95 PEAT is therefore, a reliable instrument.

Recommendations and Conclusion

PEAT is a valid and reliable instrument for assessing adult learners in physical education. It should be used for both formative and summative evaluation of adult learners in senior primary.

It could be used to obtain the profiles of learner as well as areas of deficiencies in physical education. Group or individual remedial work can therefore, be prescribed. Education should endeavour to develop valid and reliable tests in other state in Nigeria.

Tests should be constructed to involve areas of effective 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 able to write valid and reliable test items.

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