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CONSTRUCTION OF AN ACHIEVEMENT TEST IN SOCIAL SCIENCE FOR VIII STANDARD

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ABSTRACT

Mathematics is the foundation for success in a variety of content areas during a child's educational experience. Since RTE 2009 assures quality elementary mathematics education to every child, achievement in mathematics plays a crucial role in a student's future planning of advancement in life. The objective of the paper is to construct a standardized achievement test in mathematics. Random sampling techniques were adopted and pilot study was administered among 77 students. Sample size was 400 students of 19 schools in South 24 Parganas of West under W.B.B.S.E. Most of the items were of objective type. Data were analysed using percentage, Mean, SD, T-test. Item analysis were done on 40 items by determining difficulty level and discriminating index (DI>0.20 and 0.33 < DL <0.70). The reliability of the test was established by the KR-20 method and split-half method. Values found by the KR 20 method and the split-half method were 0.87 and 0.91 respectively. Face validity of the test was established by means of compelling opinion of the subject experts and the concurrent validity was established using result of annual examination of the respective schools. The value of the correlation coefficient was found 0.92. The Norms were established using percentile rank and Z-scores and grading system of W.B.BS.E. for class VIII.

KEYWORDS: Mathematics, Construction,

INTRODUCTION :
Construction and / or Pooling of Test Items

As the test was to be administered to students who were studying in high schools in Bellary district, who's mother tongue/regional language was Kannada, the test items in Social Science were drafted in their regional language.

The following sources were consulted for construction and / or pooling of test items in Social Science :

i. VIII Standard Social Science textbook, Government of Karnataka, Bangalore.

ii. Review of research and/or theoretical underpinnings.

iii. Other similar tools

iv. Requesting representative members of the largest group to write statements, such a process ensures content validity.

v. A Social Science textbook for Secondary Schools Class VIII, National Council of Educational Research and Training. February, 1999.

vi. Personal experiences of the investigator.

PREPARATION OF BLUE – PRINT

A three dimensional blue-print showing coverage of content, instructional objectives and types of items was prepared by referring the VIII Standard textbook of Social Science, and in consultation with the guiding teacher and personal experience. This blue-print is given below :

Blue Print for the Academic Achievement Test in Social Science – Final Test

Sl. No.	OBJECTIVES	KNOWLEDGE			UNDERSTANDING			APPLICATION			SKILL			TOTAL
	Specifications	O	S	E	O	S	E	O	S	E	O	S	E	
1	HISTORY	28(28)	-	-	7(7)	-	-	-	-	-	1(1)	-	-	36 (36)
2	CIVICS	3(3)	-	-	-	-	-	-	-	-	-	-	-	3 (3)
3	GEOGRAPHY	15(15)	-	-	4(4)	-	-	1(1)	-	-	-	-	-	20 (20)
4	ECONOMICS	6(6)	-	-	1(1)	-	-	-	-	-	-	-	-	7 (7)
	TOTAL	52 (52)			12 (12)			1 (1)			1 (1)			66(66)

Figures out side the brackets indicate the marks.

Figures within the brackets indicate the number of questions.

O – Objective type, S – Short answer type, E – Essay type.

Distribution of Marks to Different Instructional Objectives

Sl. No.	Instructional Objectives	Marks	Percentage
1	Knowledge	52	78
2	Understanding	12	18
3	Application	1	2
4	Skill	1	2
	Total	66	100

Academic Achievement Test in Social Science – Content Weightage

Sl. No.	Content / Sub-Unit	Marks	Percentage
1	History	36	55
2	Civics	3	4
3	Geography	20	30
4	Economics	7	11
	Total	66	100

Academic Achievement Test in Social Science – Question Type Weightage

Sl. No.	Type of Question	Marks	Percentage
1	Objective Multiple Choice Questions	66	100
	Total	66	100

Screening of Test Items

The test was referred to representatives of high school teachers. This was done with a view to retain one

of the synonymous items, and the items, which could fit into the framework. Items, which were vague were discarded and remaining items were edited to make it clear.

Writing of Directions

Suitable directions were given on the top of the each item. Further, the mode of giving response to the various items was illustrated with specific example.

Try Out

Before constructing the test items, the investigator has done a thorough study of the methodology and objectives of Social Science. Initially seventy items were prepared. The test was tried out in 10 high schools in Bellary. In order to administer the test, the co-operation of the school teachers was sought. The students were specifically given to understand that (i) there was 1 hour time limit for completing the test; (ii) the scores of the test would be used only for research purpose; and (iii) the honest and accurate answers of the students to test items would help the study in developing a reliable test in Social Science. The test was administered to 100 students studying in VIII standard.

Scoring

The answers to the test items were of multiple choice type questions. Therefore, one mark was awarded to each right answer given by the student. Sum of the item scores gave the scores on performance in Social Science. The score for each student was calculated separately.

Item Analysis

Each test item was subjected to analysis in terms of i) difficulty value, and ii) item validity. The scores obtained by the Ss (n = 100) were first arranged in the descending order. The two groups – 'high scoring' and 'low scoring', each composed of 27 per cent, i.e., 27 of the Ss of the sample 100 formed the basis for the computation of validity and difficulty indices.

For determining item validity, numerous indices and procedures were available. In the present study, the correlation approach, i.e., correlating the item score with the test score was followed. For computing item test correlation, the 'Point-biserial correlation method' (Guilford, 1954, P. 427) was used. The choice of this method was based on two considerations : (i) one of the variables namely item score is in the form of genuine dichotomy (1 or 0) ; (ii) labour saving 'abac' is developed by Flanagan for determining estimates of rpbis.

The difficulty value of each test item was determined by using the following formula :
Where,

$$D = \frac{U + L}{2}$$

D = difficulty value of the item;
U = percentage of students scoring the item correctly in the upper or higher scoring group; and
L = percentage of students scoring the item correctly in the lower or low scoring group.

Final Tool

Item with 100 percent and 0 percent difficulty value and items with less than 0.25 validity coefficients were deleted (Thorndike, 1966, pp. 245). As a result of the final analysis, determination of 'D' values (also the determination of r values), out of the total number of 114 questions constructed by the investigator 48 questions were rejected. The final tool consisted of 66 questions in all. The directions for using the test were found to work well and were retained without modification. See Appendix for the final tool along with the directions.

Collection of Data

In order to collect essential data for the purpose of the study, the investigator used the Guilford's Type

Test of Cognition Abilities, viz., figural, symbolic, semantic and behavioural, and Academic Achievement Test in Social Science were developed specifically for the purpose. The test was administered by the investigator personally in all the twelve high schools with a view to control class teachers' influence on the test performance. The testing was done in a normal classroom situation and during normal school hours only. The students were properly given instructions regarding the time allotted to each test and the marking procedure. The proper care was taken with regard to the seating arrangement, size of the class, ventilation, etc. The investigator collected the response sheets personally after the test.

Statistical Techniques Used

In pursuance of the Specific Objectives – 1, 4, 7, 10 and 13, the Pearson's Product–Moment Coefficient of Correlation technique was used to find the relationship between independent variables and dependent variable. Further, the obtained r values were tested for significance using 't' test.

In pursuance of the Specific Objectives – 2, 5, 8, 11 and 14, the Multiple Regression Analysis (normal) was used with the different independent variables fitted into a Regression equation. This provided an indication about the relative potency of variables under consideration. The relative contribution of the independent factors to the criterion variable was calculated by multiplying regression coefficients with the correlation coefficients and converting the same into percentages.

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