Construction and standardization of Achievement test in Accountancy

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Abstract
This present study is an attempt to construct and standardized a test in Accountancy to measure the achievement of students of XI class. A list of 86 items has been prepared which contains the objective type (multiple choice, fill-ups and true/ false) items related to the Accountancy subject and this test is based on the XI class syllabi prescribed by the Board of School Education, Haryana (BSEH). A list of 86 items has been given to some professors in the field of education and subject experts alongwith 5 students of XI class to examine the linguistic ambiguity, item difficulty and relevance. After discussion with subject experts, professors and students some of the items were eliminated and modified. The second draft which contains 77 items has been administered on 50 students of the XI class. 51 items having difficulty value and discriminating power ranging from 0.20 to 0.80 were retained in this achievement test. The reliability of the test was found 0.87 and 0.86 by using the Split half method and Rulon and Flanagan Formulas respectively. Content validity was established with the help of experts in the field of commerce and education.
Keywords: Achievement, Accountancy, Planning, Construction, Standardization.

Introduction:
ACHIEVEMENT TEST
Achievement test refers to the level of success or proficiency and mastery over the subject that the learner has already attained in the subject. An achievement test is designed to measure the understanding, skill and knowledge acquired in a given grade through planned classroom instruction and training.

Standardized achievement tests are the most popular type of achievement test to access knowledge in a specific subject. It is constructed by the experts or specialists by following the standard procedure of construction, administration, scoring and interpretation.

The purpose of this test is to measure the student's knowledge about the subject. Higher score in test indicates the mastery over content and readiness to accept advanced instruction. Low score in a test indicates the need for remedial teaching or revising of the course material.

According to N.M. Downie (1961), "Any test that measures the attainments or accomplishments of an individual after a period of training or learning is called an achievement test."

According to Robert L. Thorndike and Elizabeth Hagen (1969), "Achievements are performance based to show that a pupil has already learnt to do".

Steinberger (1993), "Achievement encompasses student ability and performance, it is multidimensional, it is intricately related to human growth and cognitive, emotional, social and physical development; it reflects the whole child; it is not related to a single instance, but occurs across time and levels, through a student's life in school and on into post-secondary years and working life".

Conceptual Framework of Achievement test in Accountancy:
Accountancy is an important subject in the school curriculum at higher secondary stage. Knowledge of accountancy as a subject helps the students to maintain systematic records of financial transactions and classify, summarize and interpret the results in a significant manner which is beneficial to the users for decision-making purposes. Accountancy serves as a language of finance.

At its most basic level, assessment in any discipline is possible through a standardized achievement test in that concerning discipline, which assesses the student's potential as well as gives quantitative and qualitative feedback to the teachers. Moreover, they improve their methods or techniques of teaching and provide remedial teaching to the low scorers accordingly.

So Development of standardized test in any discipline is very important and decisive stage. Here investigator tried to develop a standardized test of Achievement in Accountancy for the XI class.

CONSTRUCTION AND STANDARDIZATION OF ACHIEVEMENT TEST IN ACCOUNTANCY:

The construction of this test was an important task that involved two aspects i.e. what to measure and how to measure.

The process of test construction was carried out in three phases such as (1) Planning phase (2) Preparation or construction phase (3) Standardization phase. The description of these phases is given below:

1. PLANNING PHASE:

Planning is essential not only in teaching and learning but in all domains. Careful planning is a very important step in the construction and standardization of an achievement test. The planning of the test was done in the light of various aspects such as a group of the learners on which test has to be administered, age of the learner, objectives of the test, previous knowledge of the learner, expected learning outcomes and subject matter of the test etc. The investigator planned the test using the following steps:

a. Purpose of the test: The purpose of the test was to measure the attainment of knowledge, understanding and application of the concepts of Accountancy as prescribed in the syllabi of class XI.

b. Content of the Test: The selection of content is an important phase in the construction of any achievement test. This test covered the content from Unit-1 of Accountancy textbook of class-XI prescribed by the Board of School Education, Haryana (BSEH) which is shown in the following table:

Table 1: Details of the selected content

Sr. No.	Topics
1.	Meaning, characteristics, objectives, functions of Accounting, Accounting Cycle
2.	Types, Users, Advantages, and Limitations of Accounting
3.	Basic Accounting terms I: Capital, drawing, liabilities, assets, receipts, expenditure, expenses, income, profit, gain, loss
4.	Basic Accounting terms II: Purchase, sales, stock and its types, inventory, Debtors and bills receivables, creditors and bills payables, goods, cost, discount and its types
5.	Accounting Principles: Accounting concepts or Assumptions
6.	Accounting Principles: Accounting conventions
7.	Meaning of Accounting equations, effect of transactions on Accounting equations
8.	Meaning, Characteristics, Advantages, Disadvantages of Double entry system
9.	Classifications of Accounts
10.	Journal: meaning Features, Rules of Journalizing
11.	Opening entry, Compound Journal Entries, Some special entries
12.	Special purpose subsidiary book I : Purchase book, Sales book, Purchase return book
13.	Special purpose subsidiary book II: Sales return book, Journal proper, Cash book
14.	Meaning, features, importance and format of Ledger
15.	Rules of posting into the ledger
16.	Meaning, Need and importance, causes and factors determining the amount of depreciation
17.	Straight line method of depreciation: meaning, merits, demerits, suitability
18.	Written down value method of Depreciation: meaning, merits, demerits, suitability

19.	Meaning and importance of Provisions and Reserves, Difference between Provision and Reserve
20.	Types of Reserves: Revenue and Capital

Table 1 shows that twenty topics were selected from the prescribed syllabus of Accountancy for XI class affiliated to the Board of School Education, Haryana (BSEH).

c. Target population: The target population included Commerce students of XI class of Board of School Education, Haryana (BSEH) based schools in Ambala city.

d. Objective of the test: The objectives of the achievement test in accountancy were fixed in behavioral terms according to Bloom's taxonomy of educational objectives. Knowledge, understanding and application categories of objectives were identified in the given instructional material.

Weightage is given to the objectives of the Achievement test

S. No.	Objectives	Percentage of items measuring objectives
1.	Knowledge	51
2.	Understanding	30
3.	Application	19

Table 2 shows the weightage given to the objectives.

2. PREPARATION PHASE:

a. Size and Types of Test Items: The achievement test in accountancy comprised multiple choice objective type items, fill-in-the-blanks and true-false items. In the initial draft, a pool of 86 items was selected from the 1st unit of the Accountancy textbook of XI class.

b. First draft of Achievement test: Initial draft was given to subject and language experts and a group of 5 students of XI class associated to the commerce stream. Suggestions were welcomed. Items were edited and removed with respect to language ambiguity, relevance and item difficulty. A set of 77 items were selected after modifications and elimination of items for the first draft.

c. Preparation of Blueprint: It is an important part in the preparation of any achievement test. A detailed blueprint of achievement test in accountancy was prepared by the investigator given below:

Blueprint of the test

No.	Topics	Knowledge			Understanding			Application			Total
		MC	F	T/F	MC	F	T/F	MC	F	T/F	
1.	Meaning, characteristics, objectives, functions of Accounting, Accounting cycle	1	-	1	1	-	-	-	-	-	3
2.	Types, Users, Advantages, and Limitations of Accounting	2	-	-	1	-	-	-	-	-	3
3.	Basic Accounting terms I: Capital, drawing, liabilities, goods, cost, receipts, expenditure, expenses, income, profit, gain, loss		2	-	2	-	-	1	-	-	5
4.	Basic Accounting terms II: Assets, Purchase, sales, stock and its types, inventory, Debtors and bills receivables, creditors	2	-	-	1	-	-	-	-	-	3

	and bills payables, discount and its types										
5.	Accounting Principles: Accounting concepts or Assumptions	2	-	1	1	-	-	-	-	-	4
6.	Accounting Principles: Accounting conventions	1	-	-	1	1	-	1	-	-	4
7.	Meaning of Accounting equations, effect of transactions on Accounting equations	-	-	1	1	-	-	3	-	-	5
8.	Meaning, Characteristics, Advantages, Disadvantages of Double Entry System,	-	1	1	-	-	-	-	-	-	2
9.	Classifications of Accounts	-	1	-	1	-	1	-	-	-	3
10.	Journal: Meaning, Features, Rules of Journalizing	1	-	-	1	1	-	2	-	-	5
11.	Compound Journal entries, Opening entry, Some special entries	1	-	-	2	-	-	1	-	-	4
12.	Special purpose subsidiary book I: Purchase book, Sales book, Purchase return book	2	-	-	2	-	-	1	-	-	5
13.	Special purpose subsidiary book II: Sales return book, Journal proper, Cash book	2	-	-	1	-	-	-	-	-	3
14.	Meaning, Features importance and format of Ledger	1	-	2	-	-	-	-	-	-	3
15.	Rules of posting into ledger	2	-	1	2	-	-	2	-	-	7
16.	Meaning, Need and importance, causes and factors determining the amount of depreciation	3	1	1	1	-	-	-	-	-	6
17.	Straight line method of depreciation: meaning, merits, demerits, suitability	-	-	1	-	-	-	1	-	-	2
18.	Written down value method of Depreciation: meaning, merits, demerits, suitability	-	1	-	-	-	-	3	-	-	4
19.	Meaning and importance of Provisions and Reserves, Difference between Provision and Reserve	1	-	-	2	-	-	-	-	-	3

20.	Types of Reserves: Revenue and Capital	-	1	2	-	-	-	-	-	-	3
	Total	21	07	11	20	02	01	15	00	00	77

Table 3 shows the blueprint of the Achievement test in accountancy

Here: MC for multiple choices, F for fill in the blanks and T/F for true and false

Second draft of test: After modification and elimination, 77 items were selected for the first draft. All the items were evaluated by the experts as well as researchers also. 3 items were eliminated and some of the items were modified after discussion with experts. A pool of 74 items was retained in the second draft of the achievement test in accountancy.

Criteria for Scoring: A criteria of assessment was prepared for scoring the test. One mark was to be given for the correct response and zero was to be given for the wrong answer.

Administration of the test

Pilot testing:

The second draft was administered on the sample of 50 commerce students of XI class Government school affiliated to the Board of School Education, Haryana (BSEH) of Ambala city who were not included in the experiment. One hour was given to the students to complete the test.

Standardization phase:

Item Analysis:

Item analysis is an important step in any research. This technique is used for accepting and rejecting the items on the bases of difficulty value and discriminating power. Item analysis helps to check the strength and weaknesses of the test item. After the collection of response sheets from 50 students, scoring was done with the help of a scoring key prepared by the investigator. One mark was assigned to every correct answer and zero for every incorrect answer. Kelley's (1939) criteria of item analysis were used to check out the discrimination power and difficulty value. After scoring their answer sheets were arranged in descending order on behalf of the scores. The top 27% of the scorer formed an upper group and the bottom 27% of the scorer formed a lower group. After that right answers of each item for both upper and lower groups were calculated. The difficulty value and discriminating power of each item were calculated for a total of 26 students in both groups (i.e. 13 students in the upper group and 13 students in the lower group). For calculating difficulty value and discrimination power, the following formulas were used:

Difficulty Value (DV) = RU + RL / N

Discriminating Power (DP) = RU – RL / N/2

Where,

RU = Number of right responses in the upper group

RL = Number of right responses in the lower group

N = Total number of students in both the groups

Ebel and Frisbie (1986) set the following criteria to determine the quality of the items, in terms of the discrimination power.

Table: 4 displays the value of discrimination alongwith the interpretation:

Index of discriminating power	Item evaluation
0.40 and above	Very good
0.20 to 0.39	Good but marginal (usually subject to modification)
Below 0.19	Poor item

The Difficulty Index is used to determine the difficulty level of test items. This action requires teachers to check the students who correctly answered the test item.

Table 5 shows the evaluation criteria for the selection of test items according to difficulty value.

Index of difficulty value	Item evaluation
Above 0.67	Poor item
0.60 to 0.67	Good but marginal(usually subject to modification)

0.20 to 0.59	Very good item
Below 0.59	Poor item

The difficulty value and discriminating power for each item were assigned as per table 6 given below:

Item No.	RU	RL	DV	DP	Remarks
1.	14	13	0.96	0.07	R
2.	13	12	0.89	0.07	R
3.	10	7	0.61	0.21	A
4.	7	4	0.41	0.21	A
5.	13	13	0.96	0	R
6.	11	6	0.61	0.35	A
7.	14	10	0.85	0.28	A
8.	11	9	0.71	0.14	R
9.	11	10	0.75	0.07	R
10.	10	6	0.57	0.28	A
11.	5	9	0.5	-0.28	R
12.	12	3	0.54	0.64	A
13.	13	5	0.64	0.57	A
14.	11	4	0.54	0.5	A
15.	9	5	0.5	0.28	A
16.	7	3	0.36	0.28	A
17.	14	7	0.75	0.5	A
18.	3	0	0.11	0.21	R
19.	5	2	0.26	0.21	A
20.	12	2	0.5	0.71	A
21.	3	3	0.21	0	R
22.	14	5	0.68	0.64	A
23.	12	8	0.71	0.29	A
24.	7	5	0.43	0.14	A
25.	5	1	0.21	0.29	A
26.	7	0	0.25	0.5	A
27.	9	1	0.35	0.57	A
28.	9	5	0.5	0.29	A
29.	10	1	0.41	0.64	A
30.	9	4	0.46	0.36	A
31.	7	0	0.25	0.5	A
32.	11	1	0.36	0.71	A
33.	11	6	0.61	0.36	A
34.	13	5	0.64	0.57	A
35.	10	3	0.46	0.5	A
36.	13	0	0.46	0.92	R
37.	6	1	0.25	0.36	A
38.	8	1	0.32	0.5	A
39.	8	2	0.36	0.43	A
40.	14	5	0.68	0.64	A
41.	12	0	0.44	0.85	A
42.	14	8	0.79	0.43	A
43.	5	2	0.25	0.21	A

44.	9	5	0.5	0.29	A
45.	7	3	0.36	0.29	A
46.	1	1	0.07	0	R
47.	6	2	0.29	0.29	A
48.	13	7	0.71	0.43	A
49.	3	3	0.21	0	R
50.	8	1	0.32	0.5	A
51.	3	4	0.28	-0.07	R
52.	8	4	0.43	0.29	A
53.	12	6	0.78	0.43	A
54.	14	5	0.68	0.32	A
55.	7	0	0.47	0.5	A
56.	12	3	0.56	0.64	A
57.	11	4	0.56	0.5	A
58.	10	10	0.77	0	R
59.	5	0	0.31	0.36	A
60.	13	10	0.88	0.21	R
61.	13	10	0.88	0.21	R
62.	4	2	0.24	0.14	R
63.	13	14	0.96	-0.07	R
64.	8	7	0.54	0.07	R
65.	10	7	0.61	0.21	A
66.	11	9	0.71	0.14	R
67.	9	12	0.75	-0.21	R
68.	11	8	0.68	0.21	A
69.	10	12	0.78	-0.14	R
70.	13	9	0.78	0.21	A
71.	12	7	0.68	0.36	A
72.	13	14	0.96	-0.07	R
73.	7	6	0.46	0.07	R
74.	13	9	0.78	0.29	A

Note: 'A' stands for Accepted and 'R' stands for Rejected items
'DV' stands for difficulty value
'DP' stands for discriminating power
Table 6 shows the discriminating power and difficulty value of each item for higher and lower group of students.

Table 7: Selected and rejected items for the final draft

S. no.	F	Items	Remarks
1.	51	3,4,6,7,10,12,13,14,15,16,17,19,20,22,23,24,25,26,27, 28,29,30,31,32,33,34,35,37,38,39,40,41,42,43,44,45, 47, 48,50,52,53,54,55,56,57,59,65,68,70,71,74	Accepted
2.	23	1,2,5,8,9,11,18,21,36,46,49,51,58,60,61,62,63,64,66, 67,69,72,73	Rejected

Table 7 shows that only those items were selected which possessed the range above 0.20 to 0.80 in discrimination index and difficulty value. 23 items out of total 74 items were rejected while a total 51 items were retained for the achievement test in accountancy. Thus achievement test in accountancy had 51 test items.

Reliability

Reliability refers to the consistency of outcomes when the same test is repeated at equal time intervals. The split-half approach was used to determine the reliability of the Achievement test of accountancy. In the split-half method, a test is divided into two equal sections. The odd-even technique is the most prevalent technique of splitting the test. In this procedure, all odd-numbered items (such as 1,3,5.7, etc.) represent one portion of the test while all even-numbered items (such as 2,4,6,8, etc.) constitute another part of the test. As a result, each student earns two sets of scores. Thus, two sets of scores are obtained from a single administration of the single test. The reliability of the entire test is assessed using this half-test reliability. The test's reliability was found to be 0.87 by using the split half method and 0.86 by using Rulon and Flanagan Formulas.

Validity

The test's validity relates to the degree to which it measures what it is supposed to measure. Anastasi (1968) has stated "The validity of a test concerns what the test measures and how well it does so." The content validity was determined with the help of experts in the fields of education and commerce. To improve the content validity of the achievement test, five Accountancy teachers from senior secondary schools and two professors in the field of education were given this test individually to revise the items and provide feedback on whether each item correctly matched to the content area stated or not. The achievement test's content validity was thus established.

Conclusion

This study was carried out to construct and validate the achievement test. For this purpose, the final test was administered on a sample of 50 commerce students of the XI class. Out of 74 items, 51 items were retained in the final draft of the achievement test in accountancy. The reliability was found 0.87 and 0.86 by using Split half and Rulon and Flanagan Formulas respectively which were good reliability scores. Content validity was established with the help of experts. Hence this achievement test in accountancy has high reliability and validity.

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