CONSTRUCTION AND VALIDATION OF GENERAL APTITUDE TEST (GAT)

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ABSTRACT

An aptitude test is an instrument used to determine and measure an individual's ability to acquire, some specific set of skills. Aptitude tests are used to access and measure the aptitude of an individual in different fields or activities. Aptitude tests are classified according to the specific nature of the aptitude tested by them, such as mechanical aptitude test, clerical aptitude test, professional aptitude test and scholastic aptitude. Aptitude test enables us to locate, with a reasonable degree of certainty, the fields of activity in which as most likely to be successful. There are many aptitude tests and the one chosen by the investigator is called the General Aptitude Test. This test covers the following areas namely viz., Verbal Reasoning, Abstract reasoning, Mechanical Reasoning, Numerical Ability, Spelling, and Language Use. The test is performed under exam conditions and strictly timed. All questions have four choices definite right answer. The sample for the test was the higher secondary student who successfully usually completes the entire test. The validation has been done by following the standard procedure being the index of difficulty and index of discrimination out of the 60 multiple choice questions 48 has been selected. The validity and reliability has been found to be 0.86 and 0.75 using the test retest method. Hence the General Aptitude Test has been evolved.

KEYWORDS:

Reasoning, Aptitude, Test.

INTRODUCTION

An aptitude test is an instrument used to determine and measure an individual's ability to acquire, some specific set of skills. Aptitude tests are used to access and measure the aptitude of an individual in different fields or activities. Aptitude tests are classified according to the specific nature of the aptitude tested by them, such as mechanical aptitude test, clerical aptitude test, professional aptitude test, and scholastic aptitude. Aptitude test enables us to locate, with a reasonable degree of certainty, the fields of activity in which as most likely to be successful. There are many aptitude tests and the one chosen by the investigator is called the General Aptitude Test. This test covers the following areas namely viz., Verbal Reasoning, Abstract reasoning, Mechanical Reasoning, Numerical Ability, Spelling, and Language Use. The tests are performed under exam conditions and are strictly timed. All questions have four choices and a definite right answer. These tests can be used to help an individual 1. Chose among educational and career options based on strengths and weakness. 2. Understand why they do well or poorly in certain subjects. 3. Can suggest new career options not previously considered. 4. Change or raise educational and career aspirations. They cannot however, pinpoint one specific career or one specific subject that an individual should pursue. All test of this nature should be viewed with extreme caution. Under no circumstance should the score be interpreted as final indisputable evidence of an individual's characteristics. The results provide only one small part of the information needed to help an individual make informed and realistic decisions and cannot be judged in isolation from other aspects of a person's character including, job and other experiences, interests, goals, personality, values, family and environmental influences. Finally, it needs to be remembered that an individual can have an aptitude for a particular area but have no interest in it, and conversely, may have a low aptitude in area a have an extreme interest or liking for it. Aptitude tests enable us to locate, with a reasonable degree of certainty, the fields of activity in which an individual is most likely to be successful. Therefore, these tests can be useful to guide the students in the selection of specialized courses in education, fields of activities, and vocations.

NEED AND IMPORTANCE OF THE STUDY

Aptitude is the natural or inborn skill or ability in learning which varies across individuals. Some can excel over others in acquiring knowledge of specific subjects or skills in a particular field when compared to their peers. They tend to possess a capability for excelling well

above the general intellectual ability. Such persons are said to possess the aptitude for proficiency in a specific area of study. Bingham (1937) has said, "Aptitude is a condition or set of characteristics regarded as symptomatic of an individual's ability to acquire with training some usually specified knowledge, skill or set of responses." Freeman (1971), has described aptitude as "a combination of characteristics indicative of an individual's capacity to acquire (with training) some specific knowledge, skill, or set of organized responses, such as the ability to speak a language, to become a musician, to do mechanical work." Hence the investigators tend to construct and validate a General Aptitude Test.

GENERAL APTITUDE TEST (GAT)

The General Aptitude Test constructed by the investigators possesses 75 multiple choice questions set against four alternatives with the Scoring Weightage of 1 and 0 has been given for right and wrong answer respectively.

PILOT STUDY OF THE TEST

To validate this test a Pilot Study has been conducted with a sample of 100 Higher Secondary Students studying in Salem district selected through simple random sampling technique.

ITEM ANALYSIS

Pre- Pilot Phase

Pre- pilot phase is concerned with item pooling. It consists of

a) Item coverage

b) Source of items

c) Laying down criteria for item collection

a) Item coverage

Item coverage for General Aptitude Test covered the following dimensions,

(i). Verbal Reasoning

(ii). Abstract Reasoning

(iii). Mechanical Reasoning

(iv). Numerical Ability

(v). Spelling and

(vi). Language Use

b) Sources of Items

The preliminary item pool was made by drawing items from the following sources review of thematic and research work. By careful analysis of the above sources, multiple choice questions were collected. Thus a total of 75 items were gathered during this stage.

c) Criteria for selection of items

The collected multiple choice questions were not directly administered, but they were subjected to screening. The following criteria were considered while screening and thereby some multiple choice questions were added or excluded. The language of the multiple choice questions should be simple, clear and unambiguous. The rater should clearly know that he/she is rating at 1 or 0 for the Aptitude test.

The direction should be clear and comprehensive, also indicate the need for honest rating. Each and every multiple choice questions should be short. The statements that are likely to be enclosed by almost every one or no one should be avoided. The compound and complex multiple choice questions should be avoided.

Pilot Study Phase

Once the multiple choice questions are collected, the next step is pilot study. The pilot study is concerned with refining the multiple choice questions collected during the pre- pilot state. The refinement of the multiple choice questions has been conducted at two levels a) judgment analysis, b) Item analysis

a) **Judgment Analysis**: Judgment analysis implies eliciting the opinion of the experts in the area of study regarding the suitability and objectivity of the multiple choice questions pooled. All the 75 multiple choice questions gathered during the pre pilot stage were sent to a jury opinion regarding their suitability and clarity. On the basis of the jury council's judgment, some of the multiple choice questions were restructured and some were eliminated. At last, a total of 75 multiple choice questions were retained.

b) **Item Analysis**: Having refined, reworded and eliminated ambiguous multiple choice questions, it was decided to put all the 75 multiple choice questions under item analysis procedure. The main objective of the multiple choice questions analysis is to obtain objective information concerning the multiple choice questions pooled. This information is valuable to eliminate subjective judgment in selecting the multiple choice questions. Further, it enables the

investigator to know how the respondents react to the multiple choice questions in the General Aptitude Test.

In the present study, the investigator has identified a sample of 100 higher secondary school students. Then the draft tool with 75 multiple choice questions was administered to them. The score for each respondent was computed and summated. Thus, the scores were arranged from the highest to the lowest. The top 27% of the response scripts were kept in one group (N=27) which was known as high group. The bottom 27% of the response scripts were kept in other group (N=27) which was known as low group. The middle group that consisted of 46% of response sheets was set aside, since the two extreme groups, high and low was needed for the item analysis.

This **General Aptitude Test** for higher secondary school students intended for pilot study contains as many as 75 multiple choice questions for a total of 75 marks. Copies of this test have been given to as many as 100 higher secondary school students. Any item whose difficulty index is lower than 10% (or) higher than 90% should be considered as worthless for measurement (Remmers et.al., 1967). Any item whose index of discrimination is above 0.30 should be considered as reasonably good item (Ebel, 1966). In the present study, only such of those items having the difficulty indices range from 30% to 90% and whose indices of discrimination ranging from 0.30 to 0.80 were selected. Thus 25 items were deleted on the above principle and only 50 items were retained in the final form of the General Aptitude Test. The final form of the test contains as many as 50 multiple choice items for 50 marks and needs 40 minutes for a student to answer (Vide: Table -1)

Table-1

General Aptitude Test - Index of Difficulty and Index of Discrimination

STATEMENT NUMBER	INDEX OF DIFFICULTY	INDEX OF DISCRIMINATION	SELECTION OF STATEMENTS
STATEMENT 1	88	0.32	SELECTED
STATEMENT 2	148	0.26	NOT SELECTED
STATEMENT 3	84	0.36	SELECTED
STATEMENT 4	72	0.32	SELECTED
STATEMENT 5	146	0.24	NOT SELECTED

STATEMENT 6	80	0.4	SELECTED
STATEMENT 7	84	0.44	SELECTED
STATEMENT 8	148	0.26	NOT SELECTED
STATEMENT 9	84	0.44	SELECTED
STATEMENT 10	92	0.12	NOT SELECTED
STATEMENT 11	88	0.32	SELECTED
STATEMENT 12	84	0.68	SELECTED
STATEMENT 13	91	0.11	NOT SELECTED
STATEMENT 14	84	0.36	SELECTED
STATEMENT 15	80	0.41	SELECTED
STATEMENT 16	72	0.32	SELECTED
STATEMENT 17	80	0.48	SELECTED
STATEMENT 18	84	0.36	SELECTED
STATEMENT 19	80	0.32	SELECTED
STATEMENT 20	88	0.6	SELECTED
STATEMENT 21	84	0.36	SELECTED
STATEMENT 22	72	0.32	SELECTED
STATEMENT 23	84	0.36	SELECTED
STATEMENT 24	80	0.41	SELECTED
STATEMENT 25	84	0.36	SELECTED
STATEMENT 26	92	0.12	NOT SELECTED
STATEMENT 27	80	0.10	NOT SELECTED
STATEMENT 28	92	0.12	NOT SELECTED
STATEMENT 29	92	0.12	NOT SELECTED
STATEMENT 30	91	0.11	NOT SELECTED
STATEMENT 31	80	0.41	SELECTED
STATEMENT 22	56	0.32	SELECTED
STATEMENT 33	80	0.10	NOT SELECTED
STATEMENT 34	88	0.32	SELECTED
STATEMENT 35	148	0.26	NOT SELECTED

STATEMENT 36	84	0.68	SELECTED
STATEMENT 37	84	0.36	SELECTED
STATEMENT 38	92	0.12	NOT SELECTED
STATEMENT 39	80	0.41	SELECTED
STATEMENT 40	80	0.10	NOT SELECTED
STATEMENT 41	72	0.32	SELECTED
STATEMENT 42	80	0.48	SELECTED
STATEMENT 43	146	0.24	NOT SELECTED
STATEMENT 44	84	0.36	SELECTED
STATEMENT 45	80	0.32	SELECTED
STATEMENT 46	92	0.12	NOT SELECTED
STATEMENT 47	88	0.61	SELECTED
STATEMENT 48	80	0.41	SELECTED
STATEMENT 49	116	0.12	NOT SELECTED
STATEMENT 50	72	0.32	SELECTED
STATEMENT 51	84	0.36	SELECTED
STATEMENT 52	80	0.41	SELECTED
STATEMENT 53	164	0.24	NOT SELECTED
STATEMENT 54	84	0.36	SELECTED
STATEMENT 55	156	0.26	NOT SELECTED
STATEMENT 56	80	0.32	SELECTED
STATEMENT 57	88	0.61	SELECTED
STATEMENT 58	172	0.26	NOT SELECTED
STATEMENT 59	80.	0.88	SELECTED
STATEMENT 60	84	0.76	SELECTED
STATEMENT 61	84	0.84	SELECTED
STATEMENT 62	80	-0.28	NOT SELECTED
STATEMENT 63	84	0.68	SELECTED
STATEMENT 64	80	0.76	SELECTED
STATEMENT 65	92	0.22	NOT SELECTED

STATEMENT 66	84	0.76	SELECTED
STATEMENT 67	164	0.24	NOT SELECTED
STATEMENT 68	84	0.88	SELECTED
STATEMENT 69	84	0.68	SELECTED
STATEMENT 70	84	0.81	SELECTED
STATEMENT 71	84	0.32	SELECTED
STATEMENT 72	84	0.76	SELECTED
STATEMENT 73	180	0.26	NOT SELECTED
STATEMENT 74	84	0.76	SELECTED
STATEMENT 75	116	0.12	NOT SELECTED

As many as 50 multiple choice questions have been chosen in order to form the final draft (Table – 1).

RELIABILITY AND VALIDITY OF THE GENERAL APTITUDE TEST (GAT)

The Reliability of the General Aptitude Test has been found using the test – retest method and they are found to be 0.86 and it Intrinsic Validity has been found to be 0.75. Thus from the two coefficients, it may inferred that this General Aptitude Test (GAT) is highly Reliable and Valid.

CONCLUSION

Thus the investigators constructed and validated General Aptitude Test (GAT) and contributed it to the field of education.

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