



Construction and Validation of a Tool Measuring the Attitude Towards Science of High School Students

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ABSTRACT

A five point scale of Strongly agree, Agree, Undecided, Disagree, Strongly disagree and weightage of 5,4,3,2,1 are given in that order for the favorable statement and the scoring is reversed unfavorable statements. The scoring in the scale ranges from 1 to 275 in the direction of the unfavourable attitude towards science to favourable attitude towards science. The final scale consists of 55 statements.

Key words: Attitude towards Science, High school students

Introduction

For scientific educators, attitudes toward science, scientists, and learning science have always been a source of worry. In discussing challenges in science education, the term "attitude" is frequently used in a variety of settings. There are two broad groups that can be distinguished. The first is one's perspective on science.

The main aim of this study is to construct and validate a tool for measuring the Attitude towards Science of High school students. The means of estimating a person's attitude is to get a sample of his expressed opinion, as a reaction to certain statements. The Investigator must depend upon what the individual tends to respond, favourably or unfavourably, based on his positive or negative prejudices. The total pattern of one's opinion to the different items reveals one's Attitude towards science. Attitude towards Science of High school students scale refers to a device for securing answers to questions by using a form which the respondent fills in by himself. The first step in the construction of Attitude towards Science of High school students scale, is the collection of a large number of statements, both favourable and unfavourable, from sample under study. According to Allen L. Edwards (1957), the following types of statements are avoided in an attitude scale:

- i. Statements that refer to the past rather than the present
- ii. Statements those are factual or capable of being interpreted as factual.
- iii. Statements that can be interpreted in more than one way
- iv. Statements that are relevant to the psychological object under consideration
- v. Statements those are likely to be endorsed by almost everyone or by almost none.
- vi. Statements that contain double negatives and statements those are rather long.

Pilot Study

For the purpose of this study, Simple random sampling technique has been used to select the sample of this study. From the High schools of Vellore District 100 High school students have been randomly selected and used as subjects of this study. For this purpose, the investigator referred journals and related literature and prepared 75 statements pertaining to the Attitude towards Science of High school students, for the Pilot study (Appendix-II).

Thus 20 statements were deleted and 55 statements were selected to find for Attitude towards science. This is given in the Appendix III.

Item Analysis

The investigator calculated the 't' values for all the 75 items. The items were selected using the norms mentioned by Allen Edwards. The following table shows the 't' values of each statement and selection of the items.

Table No. 1
Item Analysis of Attitude towards Science

Statement No.	t -Value	Decision for selection
1.	3.195	Selected
2.	4.571	Selected
3.	4.391	Selected
4.	5.536	Selected
5.	8.54	Selected
6.	4.44	Selected
7.	1.667	Not Selected
8.	1.719	Not Selected
9.	0.257	Not Selected
10.	0.084	Not Selected
11.	2.288	Selected
12.	1.298	Not Selected
13.	1.741	Not Selected
14.	1.74	Not Selected
15.	6.143	Selected
16.	6.615	Selected
17.	7.652	Selected
18.	2.728	Selected
19.	4.909	Selected
20.	1.141	Not Selected
21.	3.966	Selected
22.	0.238	Not Selected
23.	4.079	Selected
24.	2.293	Selected
25.	6.184	Selected
26.	3.938	Selected
27.	7.216	Selected
28.	7.609	Selected
29.	5.936	Selected
30.	3.293	Selected
31.	8.155	Selected
32.	7.883	Selected
33.	1.741	Not Selected
34.	2.356	Selected
35.	5.119	Selected
36.	7.313	Selected
37.	8.476	Selected
38.	5.71	Selected
39.	2.271	Selected
40.	0.135	Not Selected
41.	1.692	Not Selected
42.	6.138	Selected

43.	4.728	Selected
44.	6.382	Selected
45.	4.477	Selected
46.	6.528	Selected
47.	7.981	Selected
48.	1.17	Not Selected
49.	5.294	Selected
50.	0.84	Not Selected
51.	2.953	Selected
52.	1.586	Not Selected
53.	8.822	Selected
54.	5.065	Selected
55.	3.977	Selected
56.	1.528	Not Selected
57.	3.525	Selected
58.	1.55	Not Selected
59.	0.212	Not Selected
60.	3.314	Selected
61.	2.262	Selected
62.	2.183	Selected
63.	6.708	Selected
64.	6.799	Selected
65.	6.047	Selected
66.	8.315	Selected
67.	8.155	Selected
68.	1.263	Not Selected
69.	4.125	Selected
70.	3.667	Selected
71.	5.687	Selected
72.	7.749	Selected
73.	1.303	Not Selected
74.	7.935	Selected
75.	5.803	Selected

According to Edwards the value of 't' is a measure of the extent to which a given statement differentiates between the high and low groups. Thus 20 statements were deleted and 55 statements were selected to find for Attitude towards Science.

Reliability

The reliability Co – efficient of the tool was ascertained by test- retest method, which was found to be 0.84.

Validity

The external validity of the scale was established by the investigator by getting opinions of the experts.

Scoring Procedure

The Attitude towards Science Scale consists of 55 statements, Constructed and validated by the researcher. The tool for the final study includes both positive and negative statements.

Each statement is set against a five point scale of Strongly agree, Agree, Undecided, Disagree, Strongly disagree and weightage of 5,4,3,2,1 are given in that order for the favorable statement and the scoring is reversed unfavorable statements. The scoring in the scale ranges from 1 to 275 in

the direction of the unfavourable attitude towards science to favourable attitude towards science.

Conclusion

The final scale consists of 55 statements. This scale can be used to measure attitude towards science of students of age group 10 to 15. The higher score indicates favourable attitude towards Science and the lower score indicates unfavourable attitude towards science.

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