CONSTRUCTION AND DEVELOPMENT OF ATTITUDE SCALE TOWARDS BIOLOGY

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Introduction

The knowledge attained or skills developed in school subjects, usually resolute by their attitude scores. Achievement in Biology is measured and scored only because of the attitude of the learners towards the teaching of Biology. Attitude is what a person feels or believes in. In fact it is the inner feeling of an individual which is difficult if not impossible to describe.

Objective of the study is to construct and to validate an attitude scale towards Biology for secondary school students.

The sample of the present study is involves secondary school students of 60 were selected by using random sampling technique.

Method of Study

Experimental method of research has been used in the present study. Attitude scale towards Biology which will be administered after completion of teaching Biology lessons of IX standard students to assess their attitude towards Biology subject. The attitude scale was constructed based on the three phases such as pre pilot phase, pilot phase and finalization phase.

Attitude Scale Towards Biology

In this present study the investigator has constructed and developed attitude scale to measure the attitude of secondary school students towards Biology. It consists of 20 statements of negative and positive. Each items is to be responded on five point scale i.e.,

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strongly disagree, disagree, undecided, agree and strongly agree. The sum total of these scores represents the attitude of students towards Biology.

"An attitude scale is an instrument to measure the direction and intensity of attitude".

Measurement of Attitude

Attitude can be measured by:

1. Observing behaviour
2. Asking subjects to respond to partially structured situations
3. Setting them to perform certain tasks or
4. Using self-report techniques

In the last technique, we use opinion as an index of individual's attitude subjects respond to a set of carefully selected statements from a universe content.

There are number of self-reporting techniques, the most popular among them are as follows:

1. Likert's method of summated Rating.
2. Thurstone's equal appearing Interals.
3. Gutman's Scalogram Analysis.

All these methods of measuring attitude require subjects, to indicate their agreement or disagreement with a set of statements attribute, to the object characteristic that are positively or negatively evaluated and rarely neutral. As Thurstone's method of scale construction involves a good number of personnel and a lot of time consuming process the investigator preferred to follow the Likert method.

Procedure Used for Construction of Attitude Scale

The investigator followed the following steps in construction of Attitude Scale.

Collection as Statements

The investigator collected hundred statements about Biology subject from the following sources.

1. The investigator consulted the degree college teachers of Biology subject and requested them to provide information while writing statements.
2. Some of the statements were collected from review of the related literature in which the same study was conducted for students of Hangal taluka of Haveri District.
3. Some of the statements regarding Teaching-Learning activities were collected from experienced secondary school teachers of Hangal taluka.
4. Some of the statements were collected from the library books.

5. Few of the statements were added with the personal experience of the investigator.

The statements were collected with reference to:

1. The nature and genius of the subject.
2. The utility of the language in the fields of Science and Technology, Communication medium of instruction, as library language.
3. Its Social impact and its influence in growth and development of Biology subject.
4. Teaching-Learning activity and parental influence of scope of the subject.

The investigator took care to see that the statements collected as far as possible were in conformity with the criteria laid down below:

1. The statement must be brief, simple and strait forward.
2. They must be unambiguous and relevant to the subject.
3. They must be easily compressible.
4. They should not be double barreled.
5. They should neither be vague nor too general.

The investigator gathers required statements of the subject. After gathering the statements the investigator constructed attitude scale based on Likert's scale but slight change was made in this scale where in out of the five-point scale, four-point scale was used. Those points stated Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree before each item.

In the present study, the investigator constructed a scale of attitude towards Biology as the research required to study students' attitude towards Biology subject as an instructional strategy.

The construction of the tool was done in the following steps:

- preparation of initial draft
- verification of the statements by experts
- preparation of the second draft
- validation of the attitude scale
- preparation of final draft
- method of scoring

The construction of a tool is always to decide about the areas, which cover the content to be measured. In the present investigation for the purpose of deciding this universe of content, the available sources on the Biology subject were consulted.

The investigator selected six dimensions for the construction of the attitude scale:

1. Accuracy

2. Thoroughness

3. Organization

4. Appearance

5. Usefulness

6. Creativity

The investigation prepared an initial draft of 45 items. The item were prepared under each dimension.

The initial draft of tool was submitted to the supervisor for evaluation. The supervisor suggested the following modification in order to make it suit the purpose of the study.

- Use of appropriate grammatical sentences

- Long statement were to be spilt into short specific statement

- Unspecific statements, which could not measure the objectives of the study were to be excluded.

Based on the suggestions given by the supervisor for the initial draft the statements were made concise and the items were made more specific.

All the statements of the tool were of positive polarity as suggested by the supervisor. After verification of the tool, 33 items were selected for validation.

Table 3.2 Distribution of Views in the Scale of Attitude

Towards Biology

Sl.No	Dimensions	Statements Nos.	total
1.	Accuracy	1,7,13,19,25	5
2.	Thoroughness	2,8,14,20,26	5
3.	Organization	3,9,15,21,27,31	6
4.	Appearance	4,10,16,22,28,33	6
5.	Usefulness	5,11,17,23,29	5
6.	Creativity	6,12,18,24,30,32	6
	Total	**33**	**33**

The tool was administered on 40 students as try out. Each item of the tool was tested for validity. The validity and reliability of the tool was established using Spilt half method. The reliability of the tool was found to be 0.4520. The validity of the tool was established to

be 0.6723. As some of the items in the tool were found non-significant during validation, they were (Item Nos. 1,17,22,23,28,33) deleted in the final drafting.

The final draft of the tool consisted of 27 items under 6 dimensions and were mixed and rearranged.

A five point scale was prepared to avoid central tendency effect. The points given was Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree.

The general instructions regarding the method of answering the tool were given along the tool.

Score: Since all the items in the attitude scale used positive polarity, the scores were given as Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), Strongly Disagree (1) and if it is negative polarity the scores were given as Strongly Agree (1), Agree (2), Undecided (3), Disagree (4), Strongly Disagree (5)

The summated score of all the 27 items provide the total attitude towards Biological Science score of pupils.

Administration: The final form of the scale of attitude towards Biological Science was administrated only in the Experimental group. The tool was given to pupils and they were asked to read the instructions carefully and mark their responses.

Time Duration: The time is given to complete the tool was thirty minutes for treating to the scale of Attitude Towards Biology.

Content Validity

Content validity refers to the establishment and evaluation of the significance of the test items individually and as a whole. Every item should be a sampling of that aspect which the test purports to measure. In addition, items should collectively constitute a representative sample of the variable that is measured.

The statements included in the scale were constructed from the terminology and the idea suggested by the persons, who were closely associated with the belief and involvement in the learning of science. The experts' opinion was also sought with regard to the accuracy and adequacy of the items. Thus, it can be reasonably assumed that scale possesses satisfactory content validity.

Construct Validity

Items included in the attitude scale were concentrated on all the concerning the factors associating with Biological Science like persons transacting it, persons benefiting from it, materials prescribed and required for it, aspects included in its syllabus, objectives behind its

transaction and finally beneficiaries from it. The experts reviewed the items and declared that they possess relevance to the belief on Biological Science.

The consistency reliability of the scale is found to be 0.81 and stability reliability is 0.86, which were found to be significant. The intrinsic validity ranges between 0.90 to 0.93 which were found to be significant. The scale covers adequately the entire range of attitude towards Biology. This speaks of the content validity of the scale. It may be pointed that here the reliability and validity coefficients were determined by the researcher.

Values of the Statements of Attitude Scale towards Biology

Sl. No.	Item No.	't' value	Remarks
1.	-	1.55	Detained
2.	1	3.04	Retained
3.	2	2.96	Retained
4.	3	2.55	Retained
5.	-	1.51	Detained
6.	-	1.35	Detained
7.	4	3.42	Retained
8.	-	0.07	Detained
9.	-	1.33	Detained
10.	18	2.93	Retained
11.	10	3.22	Retained
12.	-	1.34	Detained
13.	-	0.34	Detained
14.	12	3.13	Retained
15.	11	2.85	Retained
16.	17	5.00	Retained
17.	-	0.50	Detained
18.	-	0.78	Detained
19.	-	1.20	Detained
20.	9	4.67	Retained
21.	-	-1.11	Detained
22.	15	5.00	Retained
23.	-	1.50	Detained
24.	20	4.67	Retained
25.	-	-0.10	Detained
26.	-	1.19	Detained
27.	7	4.50	Retained
28.	-	-0.33	Detained
29.	-	1.40	Detained
30.	14	5.77	Retained
31.	19	6.50	Retained
32.	16	2.23	Retained
33.	-	1.00	Detained
34.	6	4.00	Retained
35.	-	0.73	Detained
36.	13	2.21	Retained
37.	8	4.50	Retained
38.	-	1.44	Detained
39.	5	3.40	Retained
40.	-	1.02	Detained

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