

Science-Related Attitudes among Freshmen Students in a Philippine University: An Assessment

Justina T. Lantajo

Abstract—The study explores freshmen students' attitudes toward science who were taking a physical science course. There were one hundred and seventy-eight (178) respondents. The used research instrument was on "Science-Related Attitudes" by Barry J. Fraser (1981). The research instrument is designed to measure seven (7) distinct science-related attitude scales: Social Implications of Science (S); Normality of Scientists (N); Attitudes to Scientific Inquiry (I); Adoption of Scientific Attitudes (A); Enjoyment of Science Lessons (E); Leisure Interest in Science (L); and Career Interest in Science (C). The profile of each scale mean score was calculated, plotted and compared to the profile of the field-tested sample. The findings in science-related attitude scale on Normality of Scientists (N) has the least mean score while that of Adoption of Scientific Attitudes (A) and Enjoyment of Science Lessons (E) scale got the highest mean score.

Keywords— assessment, attitudes, science, students

I. INTRODUCTION

ONE of the aims of science education in many countries is considering the promotion of favorable science-related attitudes. As a psychological tendency, the evaluation of attitudes will be done by a distinct being with the extent of favor or disfavor, Eagly & Chaiken (1993). Attitudes toward science, scientists, and learning science have always been a concern for science educators. The feelings, beliefs, and values of the object that may be the effort of science, school of science, the impact of science and technology on society, or scientists are descriptions of attitudes toward science. The desire to know and understand about anything; questioning to situations given; search for data and their meaning in an activity; search for verification; and consideration of consequences are related to scientific attitude, (Gardner, 1975; Osborne, Simon & Collins, 2003).

Attitudes toward science and scientist's influence views of science, future career awareness, and classroom participation. Students who have positive attitudes show increased attention to classroom instruction and participate more in science activities (Germann, 1988; Jarvis & Pell, 2005). It is important for students to develop positive attitudes toward science to enhance the learning of scientific information and science process skills, (Yager, 1996).

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Most research indicates that the longer students study typical school science, negative attitudes toward studying science, their science classes, and their science teachers developed, (Yager & McCormack, 1989). Moreover, as they move through elementary school, students are interested in some non-school activities when they get older, a little achievement with school work, more emphasis on particular science facts and test results, and not much opportunity to enjoy science. Thus, students develop negative attitudes toward science, (Yager, 1996).

How teachers realize the importance of students' feeling about science courses is an affective objective given little emphasis. Due to the neglect of the affective domain, teachers have difficulty designing strategies in developing positive attitudes toward science among students and documenting their development.

One of the legitimate goals of science education is the development of students' positive attitudes toward science courses. Science curriculum developers are required to improve the students' attitudes toward science and scientists. Furthermore, concern among adolescent student's attitudes toward science has also advanced to the possibility of increasing enrollment in elective science courses

This study determined the science-related attitudes among first-year students in a Philippine University. The science-related attitude scales focused are: (1) Social Implications of Science (S); (2) Normality of Scientists (N); (3) Attitudes to Scientific Inquiry (I); (4) Adoption of Scientific Attitudes (A); (5) Enjoyment of Science Lessons (E); (6) Leisure Interest in Science (L) and (7) Career Interest in Science (C)

II. LITERATURE REVIEW

Ways in evaluating how objects, people, actions, situations or propositions involved in learning science, defines attitudes toward science, (Gardner, 1975a). Attitudes toward science include attitude object such as "science" or "science lessons," "laboratory work" and so on (Schibeci, 1983).

Learned positive or negative feeling about science are views toward science attitudes that serves as an immediate belief about science. "I like science" or "I don't like science" are considered to be expressions of attitudes toward science. The statements denote a positive or negative feeling respectively, toward the study of science and science research (Koballa and

Crawley, 1985).

The attitudes of a person are learned as opposed to being inherited, as shown in extensive research. Previous experiences and social influences are factors that can affect a person’s attitude. Favorable or unfavorable feelings about science as a school course can be a definition of attitude towards science. Other various factors that can influence attitudes toward science are the type of science courses taken, previous science experiences and science teachers, (Morrell and Lederman, 1998).

The effect of a student’s attitude toward science is important. Recent research showed that almost fifty (50) percent of students might lose interest in science by the third grade (Weinburgh, 1998).

Since the number of students preparing for a science-related career is declining, thus, their involvement in science-related activities is also affected, (Chapman, 1997).

III. METHODOLOGY

This study utilizes the descriptive-survey method in assessing the different science-related attitudes among freshmen students.

The instrument used was a “Test of Science-Related Attitude” by Barry J. Fraser and can be utilized by teachers to obtain information about science-related attitudes of individual students or, preferably, whole classes. It is designed to measure seven distinct science-related attitude scales. First, Social Implications of Science (S), second, Normality of Scientists (N), third, Attitudes to Scientific Inquiry (I), fourth, Adoption of Scientific Attitudes (A), fifth, Enjoyment of Science Lessons (E), sixth, Leisure Interest in Science (L), and seventh, Career Interest in Science (C). This instrument has been carefully developed and was extensively field tested and shown to be highly reliable, Fraser 1981.

There were 70 items on the seven different scales with positive (+) and negative (□) statements. Each scale had ten (10) items and involved a response format described by Likert (1932).

The form required students to express their agreement with each statement on five-point scale responses as shown in

TABLE I.

TABLE I. SCORE FOR THE RESPONSE ON THE GIVEN STATEMENT

Positive (+) Statement		Negative (-) Statement	
Response	Score	Response	Score
Strongly Agree (SA)	4.01 – 5.00	Strongly Agree (SA)	0.01 – 1.00
Agree (A)	3.01 – 4.00	Agree (A)	1.01 – 2.00
Not Sure (N)	2.01 – 3.00	Not Sure (N)	2.01 – 3.00
Disagree (D)	1.01 – 2.00	Disagree (D)	3.01 – 4.00
Strongly Disagree (SD)	0.01 – 1.00	Strongly Disagree (SD)	4.01 – 5.00

If the item is invalid or omitted, a score of 3 is assigned. To obtain the seven separate scale scores, sum up the scores in all items within a given science-related scale. Since each science-

related scale contains ten items, the minimum score is 10, and the maximum is 50. Scale scores, however, cannot be added to form a meaningful total score. The table below shows the different science-related scales. Each item has a positive/negative sign, which was the basis for score allocation.

TABLE II
SCIENCE-RELATED SCALES AND THE POSITIVE/NEGATIVE SIGN IN EACH ITEM

S	N	I	A	E	L	C
1 (+)	2 (-)	3 (+)	4 (+)	5 (+)	6 (+)	7 (-)
8 (-)	9 (+)	10 (-)	11 (-)	12 (-)	13 (-)	14 (+)
15 (+)	16 (-)	17 (+)	18 (+)	19 (+)	20 (+)	21 (-)
22 (-)	23 (+)	24 (-)	25 (-)	26 (-)	27 (-)	28 (+)
29 (+)	30 (-)	31 (+)	32 (+)	33 (+)	34 (+)	35 (-)
36 (-)	37 (+)	38 (-)	39 (-)	40 (-)	41 (-)	42 (+)
43 (+)	44 (-)	45 (+)	46 (+)	47 (+)	48 (+)	49 (-)
50 (-)	51 (+)	52 (-)	53 (-)	54 (-)	55 (-)	56 (+)
57 (+)	58 (-)	59 (+)	60 (+)	61 (+)	62 (+)	63 (-)
64 (-)	65 (+)	66 (-)	67 (-)	68 (-)	69 (-)	70 (+)

The respondents of this study include one hundred and seventy-eight (178) freshmen students enrolled in a physical science course in this university.

The researcher personally handed the instruments to the participants. The participants were instructed to fill out the instrument correctly. During the conduct of the test; it is necessary to check that students are answering each item as instructed.

In obtaining the students’ total score for Scale S, the ten scores for the individual item in this scale is summed up. Follow the same procedure for getting the total score for the other science-related attitude scale. To process and interpret results, calculate the mean score on each scale obtained. Plot the profile of scale total scores and compare the profile with that obtained from the field-testing sample.

IV. RESULTS AND DISCUSSION

The results and discussion on every science-related attitude scales consisting of 10-item statements are in Table III.

It is evident that the total mean score of each science-related scale varies, but the interpretation is the same. All of the students agree on all the science-related scales as shown in Table III.

TABLE III.
THE SCIENCE-RELATED ATTITUDE SCALE MEAN SCORE OF EACH ITEM AMONG FRESHMEN STUDENTS

SCALE	RESPONSES					TOTAL MEAN SCORE	INTERPRETATION
	SA	A	N	D	SD		
S	3.63	4.69	4.71	3.89	2.03	3.79	Agree
N	1.45	4.90	6.27	2.74	0.85	3.24	Agree
I	2.77	5.25	2.97	5.73	1.64	3.67	Agree
A	3.14	5.33	2.23	5.43	3.74	3.97	Agree
E	1.88	5.69	2.83	5.66	6.73	3.97	Agree
L	1.78	4.93	3.86	5.87	2.35	3.76	Agree
C	2.04	4.48	4.76	5.13	1.68	3.62	Agree

TABLE IV.
THE MEAN OF THE TOTAL SCORES OF THE SCIENCE-RELATED ATTITUDE SCALES OBTAINED BY THE FRESHMEN STUDENTS

Attitude Scale	Mean of the Total Score
S	33.28
N	31.54
I	36.07
A	39.01
E	39.93
L	36.90
C	38.60

Table IV shows the mean of the total scores of the science-related attitude scales obtained by the freshmen students. The result is compared to the mean of the total scores obtained by the field-testing sample on each science-related attitude scales.

V. CONCLUSION

Based on the findings of this study, the science-related attitude attitudes among first-year students vary in each of the seven (7) scales containing ten (10) items having both positive and negative statements.

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