



Research Paper

A Study on the Relationship between Affective Learning outcome and Achievement in Physics of Secondary School Students

Dr.Sajna Jaleel Smt¹, Sherly Philip²

¹Assistant Professor School of Pedagogical Sciences Mahatma Gandhi University

²Assistant Professor Mount Tabor Training College Pathanapuram

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ABSTRACT: *science, as a subject is universal and has no boundaries. Teaching of science should enable the students to enrich their Affective domain. The interest, attitude and aptitude in science help students to learn and apply scientific concepts and principles in a logical and effective way. Factors such as student motivation, attitudes, perceptions and values are included in the affective domain. It is therefore not surprising that affective domain learning outcomes are often the least considered when teachers plan or conduct their lessons. Teachers can increase their effectiveness by considering the affective domain in planning courses, delivering lectures and activities, and assessing student learning. In this paper, the investigator tried to find out whether there exists any relationship between Affective Learning Outcome and Achievement in Physics of Secondary School Students for the total sample and for the subsample based on Gender. The investigator also finds out whether exist any significant differences in the Affective Learning Outcome and Achievement in Physics among Secondary School Students based on Gender. Proper statistical techniques were used for collecting standardizing and analyzing the data.*

Keywords:- Achievement in Physics, Affective Learning Outcome, Secondary School Students

I. INTRODUCTION

In the educational literature, nearly every author introduces their paper by stating that the affective domain is essential for learning, but it is the least studied, most often overlooked, the most nebulous and the hardest to evaluate of Bloom's three domains. In formal classroom teaching, the majority of the teacher's efforts typically go into the cognitive aspects of the teaching and learning and most of the classroom time is for cognitive outcomes. Similarly, evaluating cognitive learning is straightforward but assessing affective outcomes is difficult. Thus, there is significant value in realizing the potential to increase student learning by tapping into the affective domain. Similarly, students may experience affective roadblocks to learning that can neither be recognized nor solved when using a purely cognitive approach.

Many behavioral responses connected with the affective domain are experienced in science classes. In Krathwohl's Affective Taxonomy, the affective domain has encompasses multiple facets of human feelings, values, and associated behavioral responses (Krathwohl, Bloom, and Masia, 1964/1984). Kirk (2007) writes, "In the educational literature, nearly every author introduces their paper by stating that the affective domain is essential for learning, but it is the least studied, most often overlooked, the most nebulous and the hardest to evaluate of...[the three learning] domains". Brett, James (2006) describes that Affect is an important domain in which children learn.

1.2 Need and significance of the study

In science classes usually cognitive learning was addressed to develop conceptual understanding and problem solving ability, the affective domain often was intentionally avoided in science (Garritz, 2010). Krathwohl's Taxonomy of the Affective Domain is a classification system of affective behaviors representing the types of "human reaction or response to the content, subject matter, problems or areas of human experience" that reveal or call attention to "feeling, tone, an emotion, or a degree of acceptance or rejection" (Krathwohl, Bloom, & Masia, 1964/1984, pp. 3,7).

If we are striving to apply the Bloom's taxonomy to our teaching, then we are encouraging students to not just receive information at the bottom of the affective hierarchy. We'd like them to respond to what they learn, to value it, to organize it and may be even to characterize themselves as efficient students. We are also

*Corresponding Author: Dr.Sajna Jaleel Smt¹

¹Assistant Professor School of Pedagogical Sciences Mahatma Gandhi University

interested in students' attitudes. We want to find teaching methods that encourage students and draw them in. Affective topics in Science and educational literature include attitudes, motivation, communication styles, classroom management styles, learning styles, use of technology in the classroom and nonverbal communication. It is also important not to turn students off by subtle actions or communications that go straight to the affective domain and prevent students from becoming engaged.

From the discussions, it is clear that affective Learning Outcomes is essential for learning broader concepts of science. Students having better affective learning Outcome will always be eager to explore new ideas of science which will ultimately lead to better achievement in content area. Here the Achievement in Physics as a science subject can be increased by developing the Affective Learning Outcome of students towards science in general and Physics in Particular. By understanding the interconnection between Affective Learning Outcome and Achievement, Teachers can adopt various strategies and techniques in arousing Affective Learning Outcome in students that will finally lead to the mastery of content area and better achievement.

1.3 Hypotheses of the study

- There will be significant relationship between Affective Learning Outcome and Achievement in Physics of secondary school students for the total sample and sub-sample based on Gender.
- There will be significant relationship in the Affective Learning Outcome of secondary school students based on Gender.
- There will be significant relationship in Achievement in Physics of secondary school students based on Gender.

1.4 Objectives of the study

- To find out whether there exist any significant relationship between Affective Learning Outcome and Achievement in Physics of secondary school students for the total sample and sub-sample based on Gender.
- To find out whether there exist any significant difference between Affective Learning Outcome of secondary school students based on Gender.
- To find out whether there exist any significant difference between Achievement in Physics of secondary school students based on Gender

1.5 Population of the study

Secondary school students studying in the schools run by General Education Department of Government of Kerala is selected as the population of the study.

1.6 Sample selected for the study

The sample selected for the study consists of 110 secondary school students in standard VIII of various schools of Kollam District. Out of 110 samples 55 were Boys and 55 were Girls. The samples were selected by using stratified sampling Technique.

1.7 Tools used for the study

1. Affective Learning Outcome Inventory-the investigators prepared and standardized a Affective Learning Outcome Inventory, the form of a Likert type scale following a five point scale. The Inventory was prepared on the basis of five components of Affective Domain in Bloom's& Krathwohl's Taxonomy namely Receiving, Responding, Valuing, Characterisation and Organization. The investigator prepared 60 items (corresponding to each component of affective domain) initially. From these items, based on expert opinion, most suitable 40 items were selected for the Draft inventory. The final draft of the inventory was constructed by selecting the items having t values greater than or equal to 1.75 at .08 level of significance. Thus final Inventory contains 25 items. The reliability coefficient for the different elements of Affective Learning Domain was found to be Receiving-0.80, for Responding-0.82, for valuing-0.74, for Organization-0.66 and for Characterisation-0.72

2. Achievement in Physics:- An Achievement Test in Physics was prepared and standardized by the investigator from the selected units of standard VIII Physics text book. Weightage was given to the objectives according to the Taxonomy of Science Education formulated by Mc Cormack and Yager (1989). Items having Difficulty Index between 0.30 and 0.70 and Discriminating Power above 0.30 were taken for the final test. Thus 40 items were selected for the final test. The correlation between the first set of scores and the second set of scores is determined using Test-Retest Method and the reliability coefficient obtained was 0 .82. Content validity was also established through expert's opinion.

1.8 Methodology used for the study

The investigators adopted Survey Method for collecting data of Affective Learning Outcome Inventory. For the selected sample the investigators administered Affective Learning Outcome Inventory and Achievement Test in Physics among secondary school students. The answer sheets were collected tabulated and analyzed using suitable statistical techniques.

1.9 Statistical Technique used

- ✓ Descriptive Statistics
- ✓ Significance of difference between Means
- ✓ Call Pearson Product Moment Correlation

2. Analysis and Interpretation

2.1 Relationship between Affective Learning Outcome and Achievement in Physics of secondary school students for the total sample and sub-sample based on Gender.

The investigator calculated the scores of Affective Learning Outcome and Achievement in Physics. The mean and standard Deviation obtained for the total sample and subsample Boys and Girls on Affective Learning Outcome and Achievement in Physics are given in Table 1

Table 1

Descriptive statistics for the total sample and Relevant Subsamples on Achievement in Physics and Affective Learning Outcome

Variables	Total Sample		Boys		Girls	
	Mean	S.D	Mean	S.D	Mean	SD
Achievement in Physics	12.78	4.12	15.44	2.99	15.80	3.00
Affective Learning Outcome	106.95	17.54	102.64	17.84	111.27	16.29

Table 1 shows that the Mean scores obtained by Girls is slightly higher than that of Boys with respect to variables Affective Learning Outcome and Achievement in Physics. This implies that Girls have more Affective Learning Outcome than Boys which led to more Achievement in Physics for Girls than Boys. The correlation between Affective Learning Outcome and Achievement in Physics were found out for the Total sample and Subsample Gender using Pearson Product Moment Correlation. The results are given in Table 2

Table 2

Correlation between Affective Learning Outcome and Achievement in Physics of secondary school students for the total sample and sub-sample based on Gender.

Variables correlated	'r' value		
	Total Sample (N=110)	Boys (N=55)	Girls (N=55)
Achievement in Physics and Affective Learning Outcome	0.94**	0.96**	0.97**

** Significant at 0.01 level

Table 2 shows that the correlation coefficients obtained for the Total Sample, Boys and Girls are all positive. This reveals that there exists a significant difference positive correlation between Affective Learning Outcome and Achievement in Physics for the total sample and subsamples based on Gender.

2.2 Comparison of Affective Learning Outcome and Achievement in Physics of secondary school students based on sub-sample Gender.

The Mean and Standard Deviation were calculated for the subsamples Boys and Girls. Significance of difference between the Mean scores of Boys and Girls were found out for the variables Affective Learning Outcome and Achievement in Physics. The results obtained were given in Table 3.

Table 3 Comparison of boys and Girls on Affective Learning Outcome and Achievement in Physics

Variables	Gender	N	Mean	S.D	t-value
Achievement in Physics	Boys	55	15.44	2.99	0.644
	Girls	55	15.80	3.00	
Affective Learning Outcome	Boys	55	102.64	17.24	2.65
	Girls	55	111.27	16.29	

Table 3 shows that there is no significant difference between Boys and Girls on Achievement in Physics but significant difference was found in Affective Learning Outcome of Secondary School Students. The Mean score

shows that Girls are slightly higher than that of Boys in Affective Learning Outcome and Achievement in Physics.

Major findings of the study

- ✚ There exists positive Correlation between Affective Learning Outcome and Achievement in Physics of secondary school students for the total sample and sub-sample based on Gender.
- ✚ There is significant difference in Affective Learning Outcome of secondary school students based on Gender.
- ✚ There is no significant difference on Achievement in Physics of secondary school students based on Gender.

Educational Implication of the study

- ❖ The variables Affective Learning Outcome and Achievement in Physics are positively correlated. This implies that Teaching and learning activities in Science classrooms should focus ways of improving the affective components in the minds of students. Teachers should be responsible enough to integrate the Affective components in the Teaching Learning Process with the same enthusiasm given for Cognitive components.
- ❖ The Science Curriculum should be restructured by giving due importance for developing and enhancing Affective learning Outcomes since it affects the study of science.
- ❖ The result shows no significant difference between Boys and Girls in Achievement in Physics. This can be taken as merit of the present system of education. Thus gender disparity does not exist for the variable - Achievement in Physics. But shows significant difference between Boys and Girls in Affective Learning Outcome.

II. CONCLUSION

With globalization and advancement in information technology, skills within the affective domain are becoming more relevant as these become the “must-have’s” for the 21st century -citizen. So improved Affective learning Outcome is associated with pronounced readiness to acquire new domain-specific knowledge and to have differentiated knowledge structure in the corresponding subject area. Scientific personalities were persons who possess good Affective Learning Outcome. Since Affective Domain can significantly enhance, inhibit or even prevent student learning, teachers have great role to increase their effectiveness by considering the affective domain in planning courses, delivering lectures and activities, and assessing student learning.

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