

Classroom Environment and Achievement in Science Among High School Students

P.Paramasivam¹, Dr. B. Padma²

¹Research Scholar, Department of Education, DDE, Madurai Kamaraj University, Madurai-21

²Associate Professor, Department of Education, DDE, Madurai Kamaraj University, Madurai-21

Abstract-This study reports about the relationship between the classroom environment and achievement in science among high school students. 310 samples were randomly selected for this study. The tool used in this study is Science Classroom environment Opinionnaire constructed by Indirani, P.M. The results indicates there is a significant positive relationship between classroom environment and achievement in science and none of the independent variables exerts a significant influence on science classroom environment among high school students

Keywords: Classroom environment, Science, Achievement.

NEED FOR THE STUDY

Science is important in today's society, but there appears to be fewer students interested in science in high school, and fewer teachers interested in teaching science. It is necessary for students to develop positive attitudes towards science in order for them to remain interested in studying science. Science teachers have the ability to foster the development of positive attitudes if they know what type of environment encourages positive attitudes.

Developing and maintaining a positive learning environment is a foundation for effective teaching, learning process. A warm, safe, and caring environment allows students to "influence the nature of the activities they undertake, engage seriously in their study, regulate their behavior, and know of the explicit criteria and high expectations of what they are to achieve".

Behaviour is systemic and skill-based, and many of the specific behaviour expectations that schools and teachers have are unique to their system. Students do not have these expectations imposed upon them in other settings, e.g. the home or peer group, and so do not use some of the skills required by the school other than in the school setting. Schools and teachers need

to teach students the necessary skills and then revisit and re-teach the skills, especially after periods when the student has been away from the school, e.g. on holidays or in a different school system. Establishing a positive classroom environment where students are respectful of themselves and others will help reduce the risk of conflict.

Although there are some general guidelines that work successfully for many effective strategies, the important thing to keep in mind about managing the learning environment is that it is an ongoing active process in which the teacher must be a careful observer, communicator, facilitator, and manager. Hence the researcher wants to know the relationship between the science classroom environment and achievement in science among high school students. Hence the conduct of the current study.

TERMS AND DEFINITIONS

Science classroom environment- refers to surroundings or conditions in the science classroom of IX and X standard in government, aided and unaided schools in Madurai District under state board syllabus of Tamil Nadu State.

Achievement in science – refers to marks secured in science subject in the quarterly examination by the high school students in Madurai District.

High school students – refers to students who are studying in IX and X standard in government, aided and unaided schools in Madurai District under Tamil Nadu state board syllabus.

VARIABLES OF THE STUDY

The variables involved in this study are as follows:

Dependent Variables:

Science classroom environment

Achievement in science

Independent Variables:

Gender : Male / Female
 Medium of instruction : Tamil / English
 School Kind : Unisex / Mixed
 School Management : Government/Self-Financing
 School Locality : Urban / Rural
 Classroom strength : 40 and below/41 and above

METHODOLOGY- IN -BRIEF

Design : Descriptive
 Method : Normative
 Technique : Survey
 Sample
 A sample of 310 high school students in Madurai District served as the subjects of the study.
 Tools used
 Personal Information Schedule
 Science classroom environment opinionnaire constructed and standardized by Indirani.P.M. (2008) was used.
 Statistical treatment
 1. “t” test between the large independent samples.
 2. Pearson’s Product Moment Correlation

OBJECTIVES OF THE STUDY

To measure the level of Science classroom environment among the high school students.
 To measure the level of achievement in science among the high school students.
 To find out, whether there is a significant difference among high school students in terms of select independent variables in their Science classroom environment.
 To find out, whether there is a significant difference among high school students in terms of select independent variables in their science achievement.
 To find out the relationship between Science classroom environment and achievement in science among the high school students.

DATA ANALYSIS

SCIENCE CLASSROOM ENVIRONMENT AMONG HIGH SCHOOL STUDENTS

The empirical average score of science classroom environment among high school students is found to be 48.78, while the theoretical average is 42 only. This shows that the Science classroom environment among the high school students is above the average level. In other words, high school students experience conducive Science classroom environment.

HYPOTHESES OF THE STUDY

The following hypotheses are formulated for the present study:
 Each of the independent variables exerts a significant influence on science classroom environment among high school students.
 Each of the independent variables exerts a significant influence on achievement in science among high school students.
 There is a significant positive relationship between science classroom environment and achievement in science among the high school students.

DIFFERENTIAL STUDIES IN SCIENCE CLASSROOM ENVIRONMENT

The statistical measures and the results of test of significance of difference between the mean scores of science classroom environment among high school students in terms of independent variables are presented in Table 1.

TABLE 1-STATISTICAL MEASURES AND RESULTS OF TESTS OF SIGNIFICANCE OF DIFFERENCE BETWEEN THE MEANS OF CLASSROOM ENVIRONMENT: INDEPENDENT VARIABLES- WISE

VARIABLE	SUB-VARIABLES	N	MEAN	SD	‘t’ - VALUE	SIGNIFICANCE AT 0.05 LEVEL
Gender	Male	206	48.757	7.370	0.077	Not Significant
	Female	104	48.826	7.660		
Medium of instruction	Tamil	248	48.770	7.480	0.050	Not Significant
	English	62	48.822	7.422		
School kind	Unisex	154	48.812	7.450	0.088	Not Significant
	Mixed	156	48.743	7.487		
School management	Govt.	228	48.903	7.449		

	Self-finance	82	48.439	7.513	0.481	Not Significant
School locality	Rural	186	48.844	7.406	0.182	Not Significant
	Urban	124	48.685	7.561		
Classroom strength	Upto 40	101	48.831	7.374	0.084	Not Significant
	41 and above	209	48.756	7.514		

ACHIEVEMENT IN SCIENCE AMONG HIGH SCHOOL STUDENTS

The empirical average score of achievement in science among high school students is found to be 63.73, while the theoretical average is 50 only. This shows that the Achievement in science among the high school students is above the average level.

DIFFERENTIAL STUDIES IN ACHIEVEMENT IN SCIENCE

The statistical measures and the results of test of significance of difference between the mean scores of achievement in science among high school students in terms of Select independent variables are presented in Table 2.

TABLE 2: STATISTICAL MEASURES AND RESULTS OF TEST OF SIGNIFICANCE FOR DIFFERENCE BETWEEN THE MEANS OF ACHIEVEMENT IN SCIENCE: SELECT INDEPENDENT VARIABLES– WISE

VARIABLE	SUB-VARIABLES	N	MEAN	SD	't' VALUE	SIGNIFICANCE AT 0.05 LEVEL
Gender	Male	206	63.601	14.523	0.218	Not Significant
	Female	104	63.990	14.949		
Medium of instruction	Tamil	248	63.826	14.694	0.228	Not Significant
	English	62	63.354	14.558		
School kind	Unisex	154	63.889	14.732	0.188	Not Significant
	Mixed	156	63.576	14.603		
School management	Govt.	228	63.824	14.645	0.184	Not Significant
	Self-finance	82	63.475	14.729		
School locality	Rural	186	63.838	14.583	0.156	Not Significant
	Urban	124	63.572	14.794		
Classroom strength	Upto 40	101	63.742	14.669	0.009	Not Significant
	41 and above	209	63.727	14.668		

CORRELATION BETWEEN CLASSROOM ENVIRONMENT AND ACHIEVEMENT IN SCIENCE

The details of the results of correlation between the mean scores of science classroom environment and achievement in science is given below.

The obtained 'r' value is 0.91, while the critical value is 0.111. Hence there is significant positive relationship between science classroom environment and achievement in science among the high school students.

HYPOTHESES VERIFICATION

Each of the independent variables exerts a significant influence on science classroom environment among high school students.

None of the independent variables took up in this study exerts any significant influence on science classroom environment among high school students. Hence hypothesis 1 is rejected

Each of the independent variables exerts a significant influence on achievement in science among high school students.

Six independent variables used in this study could not show any significant influence on science classroom environment among high school students. Hence hypothesis 2 is rejected

There is a significant positive relationship between science classroom environment and achievement in science among the high school students.

The obtained 'r' value is 0.91, while the critical value is 0.111. Hence there is significant positive relationship between science classroom environment

and achievement in science among the high school students. Hence hypothesis 3 is accepted.

IMPORTANT FINDINGS

- High school students possess conducive Science classroom environment.
- Science classroom environment among the high school students is independent upon
 - Gender
 - Medium of instruction
 - School kind
 - School management
 - School locality
 - Classroom strength
- Achievement in science is found higher among the high school students.
- Achievement in science among the high school students is independent upon
 - Gender
 - Medium of instruction
 - School kind
 - School management
 - School locality
 - Classroom strength

There is a significant positive relationship between Science classroom environment and achievement in science.

EDUCATIONAL IMPLICATIONS

Nowadays a lot of attention is paid to the creation of learning environments that provide instruction tailored to students' needs. This study reveals that even though the high school students have little above the average level of science classroom environment science achievement is better. If the science classroom environment is very conducive the science achievement could be very high, so the teachers, administrators and government may provide the most congenial science classroom environment for better achievement among the high school students in science.

REFERENCE

[1] Aldridge, J.M., & Fraser, B.J. (2000). A cross-national study of classroom environments in

Taiwan and Australia. *Learning Environments Research: An International Journal*, 3,101-134.

[2] Chuang, H.F., & Cheng, Y.J. (2003). A study of attitudes toward biology and learning environment of the seventh-grade students. *Chinese Journal of Science Education*, 11(2), 171-194.

[3] Curry, L. (1990). One critique of the research on learning styles. *Educational Leadership*, 48, 50-56.

[4] Dhindsa, H.S., & Chung, G. (2003). Attitudes and achievement of Bruneian science students. *International Journal of Science Education*, 25(25), 907-922.

[5] Ebenezer, J.V., & Zoller, U. (1993). Grade 10 students' perceptions of and attitudes toward science teaching and school science. *Journal of Research in Science Teaching*, 30(2), 175-186.

[6] Lee, S.S.U., & Fraser, B.J. (2002). Laboratory classroom environments in Korean high schools. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, Louisiana, United States.

[7] Lin, B.-S., & Crawley III, F.E. (1987). Classroom climate and science-related attitudes of junior high school students in Taiwan. *Journal of Research in Science Teaching*, 24(6), 579-591.

[8] Scar, J. & Weinberg, F. (1983). The effects of environment on learning. *Child Development*, 65

[9] Talton, E.L., & Simpson, R.D. (1987). Relationships of attitude toward classroom environment with attitude toward and achievement in science among tenth grade biology students. *Journal of Research in Science Teaching*, 24(6), 507-525.

[10] Telli, S., Cakiroglu, J., & Rakici, N. (2003). *Learning environment and students' attitudes towards biology*. Paper presented at the meeting of the 4th European Science Education Research Association Conference, Noordwijkerhout, The Netherlands.