

A STUDY OF UNDERACHIEVEMENT IN SCIENCE IN RELATION TO ACADEMIC STRESS AND CONTROL DIMENSION OF SCHOOL ENVIRONMENT

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ABSTRACT

This paper addresses the impact of control dimension on underachievement in science and its correlation with academic stress among underachievers in science of secondary school students. The study was carried out on 400 (200 male and 200 female) underachievers in science of secondary schools of Faridabad. The students who scored below their potential on achievement test in science were labeled as underachievers in science. The rationale for the study was to identify the underachievers in science and to find out the ways through which their level of achievement in science can be improved. RPM was used to measure the intelligence of students. The results revealed that there is no significant correlation of underachievement in science with academic stress and control dimension of school environment of underachievers in science of secondary schools. The Government-Aided school students perceive more controlling school environment in comparison to the students studying in Government Schools. Increasing self-control for students is an important step toward normalization. The classroom is one setting in which unnecessary academic stress can be eliminated and opportunities for self-control can be created.

Keywords: Underachievement in Science; Academic Stress, Control dimension of School Environment.

Introduction

In the present society, achievement in term of marks in the board examination plays a significant role in deciding one's future study and employment. Nevertheless, the progress of the nation depends upon the intellectual capacity of its citizens. So, it is necessary to identify the talents in our children and to provide suitable environment, which will enable them to develop their potentialities in the direction of higher achievement. Student achievement in school is related to students' background factors, school organizational features, teachers' professional characteristics, school climate etc. These categories are related to each other, as well as to student achievement reflecting interdependencies among social factors. The general correlation of the organization of a school with academic performance can be partitioned into factors of school size, class size, normative cohesion of the staff, and teachers' sense of control in school affairs.

There has been a general concern in recent times in the educational arena regarding the academic performance of underachieving students. Barbara (2005) concluded that the processes of defining underachievement, identifying gifted underachieving students, explaining underachievement, and suggesting appropriate interventions remain controversial issues. Aside from school or family influence, Gallagher (1991) contended that personal and psychological factors could also cause underachievement in students.

The primary goal of science education in schools is students' achievement in science which includes the basic understanding of fundamental terms and ideas, the process of scientific inquiry (Miller, 1998), and the ability to apply these in everyday life in order to make informed personal decisions. Science achievement and literacy empowers youth to think critically and understand and apply scientific findings in their daily lives. As adults, scientifically literate people are better able to make fully informed medical, political, economic, and social decisions concerning individual and societal welfare (American Association for the Advancement of Science, 1993; Miller, 2002). A scientifically literate public also contributes significantly to the growth and competitiveness of science and technology in the nation.

Underachievement in Science

Underachievement can be defined as an inability or failure to perform appropriately for one's age or talents. It may be defined as an unfulfilled potential. If the students achieve below their potential in science subject, this is called as underachievement in science. Quantitatively, underachievement in science refers to the difference of one sigma score between the standard score in achievement test in science and intelligence test. More precisely, all those students who scored at least one standard less marks in achievement test in science in comparison to the marks obtained in intelligence test were considered as underachievers in science. Various factors such as Lack of motivation, Parental influence, Lack of nurturing of intellectual potential, Conflict of values Disabilities or poor health condition, Brain damage, cerebral dysfunction or neurological impairment etc. can be the cause of underachievement. Underachieving students need someone to value them and show interest in them.

Academic Stress

Academic stress refers to the experience of unpleasant emotions such as anger, tension, depression and nervousness by the students resulting from those stimuli in the environment which are concerned with their school and education. Many academic tasks and activities are demanding and therefore induce some strain. Stress up to some extent is even useful for physical well being as many students realize their full potential only when under considerable tension. However, excessive stress leads to maladaptive behavior. Academic stress is caused partly or fully by school and academic factors such as examinations, competitions, teaching process, teacher's behaviour, classroom condition, and general school environment. In the last decade or so, a problem that has affected a significant number of adolescents is academic and examination related stress and anxiety that had led to

thousand of suicides, attempted suicides and other psychological and behavioural problems across the country. It also contributes to major health hazards, physical and mental diseases.

U.K. Sinha in his article on assessment of academic stress published in journal of mental health and human behavior (2002) discusses indicators of academic stress under five categories. The students having academic stress exhibit following symptoms:

- i. Cognitive Indicators
- ii. Physical Indicators
- iii. Social/Interpersonal Indicators
- iv. Motivational Indicators
- v. Affective Indicator

School Environment

School is the second most important place after home that provides an enormous area of interaction in which personality of students is clearly expressed and shaped. The school poses new problems to be solved, new taboos to be accepted into the superego and new models for imitation and identification, all of which contribute their share in moulding personality. There are several dimensions of school environment. Control dimension is one of them. It refers to "autocratic atmosphere of the school in which several restrictions are imposed on students to discipline them". Classroom environment encompasses a broad range of educational concepts, including the physical setting, the psychological environment created through social contexts, and numerous instructional components related to teacher characteristics and behaviors.

Need and Significance of the Study

The high ability student whose scholastic performance is low is usually referred to as underachiever. Research evidence indicates that the underachievers have been the subject of continuing concern of parents and educators at all levels. The studies of Stoner (1956), Srivastava (1967), Menon (1973), Agarwal (1976), Ghuman (1976), Tondan (1977), Sharma (1978), and Puri (1987) have revealed various but differing foci and thus suggested a multifaceted nature of the problem of the underachievers.

Underachievement is a grave problem from the economic and social points of view because it involves wastage of human and economic resources and it is a problem from the learner's point of view also it causes emotional unrest and psychological tension. It causes problems not only to the underachieving students, but also to their parents and teachers. Since the cause of underachievement lies with the society for not having provided adequate opportunities to develop one's potential, it has a social obligation towards underachievers.

Science is one of the main subjects taught up to the secondary classes. It occupies an important place in the school curriculum because of its utilitarian, disciplinary, practical aesthetic and cultural values. If today's youths are not properly equipped with the rudimentary knowledge of modern science, they will grow up only to discover that haphazard knowledge of science that is not sufficient to understand

the sophisticated operation of the present information age in science and technology. Having seen the role which science has to play in nation building educators are concerned about the need to improve students' achievement in science.

Many studies in India and abroad have concentrated research on underachievement mainly at the secondary level. The investigator feels that secondary education is an important stage in the education of an individual. It is a stage to initiate diversified courses in his educational career. So, it is necessary to find out causes of underachievement in science and to develop scientific attitude and to create interest in science among the secondary school students. In spite of this many students achieve less in science than their potential. In order to fulfill their desire, they should put maximum efforts in the academic work especially in science subject. In spite of much research in the area underachievement, it appears that not much has been done to provide lasting solutions to the problem of underachievement at school, especially in subject wise in various subjects of secondary schools. Also many studies have centred on gifted underachievers at the expense of considering other areas such as gender and culture (Barbara 2005). The present study identifies the underachievement in science and its relation to control dimension of school environment of secondary school students. The study defines and identifies the causes of underachievement in science its relation with control dimension of school environment and suggests possible ways in which academic success particularly in science can be enhanced. Thus, the need for exploring scientifically the causal factors relating to underachievement in science in relation to academic stress and Control dimension of School Environment is imperative.

Statement of the Problem

A Study of Underachievement in Science in Relation to Academic Stress and Control Dimension of School Environment

Objectives of the Study

The following objectives were framed for the study;

1. To study the relationship between underachievement in science and academic stress of secondary school students.
2. To study the relationship between underachievement in science and control dimension of school environment of secondary school students.
3. To study the significance of difference, if any, in control dimension of school environment of male and female students of secondary schools.
4. To study the significance of difference if any, in control dimension of school environment of Government and Government aided secondary school students.

Hypotheses

The following research hypotheses were formulated;

1. There is no significant correlation between underachievement in science and academic stress of secondary school students.
2. There is no significant correlation between underachievement in science and control dimension of school environment of secondary school students.

3. There is no significant difference between the male and female underachievers in science of Secondary schools with respect to the academic stress among them.
4. There is no significant difference between underachievers in science of Government and Government- Aided Secondary schools with respect to control dimension of school environment.

Design and Sample of the Study

A sample of 400 underachievers in science of IX standard, 200 from government schools and 200 from government - aided schools was taken through Cluster Random Sampling technique from a population of 16 Secondary Schools situated in District Faridabad. Achievement Test in science and Advanced Raven Progressive Matrices was administered on the same population to measure their intelligence. The raw scores of achievement test in science and intelligence test were converted into standard scores. Those IX standard students who scored at least 18 less marks in achievement test in science in comparison to the marks obtained in intelligence test were taken as sample for the study. There after The school environment inventory developed by K.S.Mishra (2002) and the scale for Assessing Academic Stress (SAAS) developed by Uday Kumar Sinha, Vibha Sharma and Mahender K. Nepal (2002) were administered on the sample to collect the data.

Tools Used

The investigator used the following tools for the collection of relevant data.

1. Achievement Test in Science prepared by the investigator to know the achievement of the students in science subject.
2. Advanced Raven Progressive Matrices was used to measure the intelligence of secondary school students.
3. School Environment Inventory (SEI) developed by K.S.Mishra (2002) was used to measure the psycho-social climate of school as perceived by the pupils.
4. The scale for Assessing Academic Stress (SAAS) developed by Uday Kumar Sinha, Vibha Sharma and Mahender K. Nepal (2002) was used to assess all possible major indicators of academic stress.

Delimitations of the Study

The study was delimited to;

- The study was confined to class IX students.
- The Government and Government-Aided secondary schools were taken for study.
- The study was delimited to the urban schools of Faridabad.

Analysis of Data

The data obtained was analyzed descriptively and inferentially by calculating percentages, mean, SD, "t" values and by using Pearson's correlation. The hypothesis was tested at 0.01 and 0.05 level of significance.

Underachievement in science and its correlation with Academic Stress and Control Dimension of School Environment: Table -1 shows the coefficient of correlation between underachievement in science and academic stress. The table also shows coefficient of correlation between underachievement in science and control dimension of school environment.

Table-1: Coefficient Of Correlation between Underachievement in Science and Academic Stress among secondary school students				
S.N.	Variables	N	Correlation Coefficient	Remarks
1.	Underachievement in science	400	0.046	Not significant
	Academic Stress			

The Pearson's correlation coefficient between underachievement in science and academic stress among the underachievers in science of secondary schools was found to be 0.046 which is not significant at both 0.01 and 0.05 levels of significance. So, there is no significant correlation between underachievement in science and control level of school environment of students studying in Secondary schools. However, hard and strict control should be avoided in the schools.

Table-2: Coefficient Of Correlation between Underachievement in Science and Control Dimension of School Environment				
2.	Underachievement in science	400	0.032	Not significant
	Control dimension of School Environment			

The Pearson's correlation coefficient between underachievement in science and the control dimension of the underachievers in science of secondary schools was found to be 0.032 which is not significant at both 0.01 and 0.05 levels of significance. So, there is no significant correlation between underachievement in science and control level of school environment of students studying in Secondary schools. However, hard and strict control should be avoided in the schools.

Table-3: Comparison of Control dimension of school Environment between Male and Female underachievers in science of Secondary Schools		
Particulars	Male	Female
Number of Underachievers in Science	200	200
Mean	21.84	23.10
S.D.	5.43	4.92
Combined t-ratio	2.432	
Remarks	Significant at 0.05 level	

The mean of male and female underachievers in science of secondary schools in term of control dimension of school environment was found to be 21.84 and 23.10 respectively. Since the derived combined t-ratio for control dimension of school environment between male and female was found to be 2.432, which is significant at 0.05 level of significance. The data shows that the girls perceive a little higher level of controlling school environment than the boys.

Table-3: Comparison of Control dimension of school Environment between Underachievers in science of Government and Government-Aided Secondary Schools			
Particulars	Govt.-Aided Schools	Sec. Govt. Schools	Sec.
Number of Underachievers in Science	200	200	
Mean	24.98	19.96	
S.D.	4.79	4.35	
Combined t-ratio	10.972		
Remarks	Significant at 0.05 and 0.01 level		

The mean of control dimension of school environment of underachievers in science for Government-Aided and Government School students was computed to be 24.98 and 19.96 respectively. Since the derived combined t-ratio for control level of school environment between underachievers in science of Government-Aided Schools and Government schools was found to be 10.972, which is significant at both 0.01 and at 0.05 levels of significance. It implies that the underachievers in science of Government-Aided schools experienced more controlling school environment in comparison to the controlling school environment provided by the Government schools.

Correlation between Academic Stress and control Dimension of School Environment of Underachievers in Science:

Table-4: Coefficient of Correlation between Academic Stress and control Dimension of School Environment of Underachievers in Science			
Variables	N	Coeff. of Correlation	Remarks
Control Dimension of School Environment	400	0.079	Significant at 0.05 level
Academic Stress	400		

The coefficient of correlation between control dimension of school environment and academic stress among underachievers in science was calculated to be 0.079 which is significant at 0.05 level of significance. It implies that raising the controlling school environment, the academic achievement among the students will also increase.

Main Findings of the Study:

The important findings are given below:

- No significant correlation was found between underachievement in science and academic stress among underachievers in science of secondary schools.
- No significant correlation was found between underachievement in science and control dimension of dimension of school environment of secondary school students.

- A Significant difference was found between male and female underachievers in science of secondary schools with respect to control dimension of dimension of school environment.
- The underachievers in science of Government and Government-Aided schools differed significantly with respect to control dimension of school environment.
- After analyzing the data it is clear, that the Government- Aided schools provide better controlling school environment in comparison to the Government Schools.

Conclusion

There is no significant correlation between underachievement in science and control dimension of school environment of secondary school students. Still, school environment affects academic achievement in science of the students. It means providing better control dimension of school environment enhances achievement in science. Teachers can encourage students providing better learning which will give feedback on their better performance in science. Encouraging the students for better handling and better use of scientific process, scientific apparatus and instrument can provide insights into the problem and reveal promising intervention strategies for the remediation of the situation. Underachievers in science can achieve better if they are provided with the appropriate controlling school environment.

Educational Implications

- Self-control is a lesson we need to teach students. Students need to participate in determining the classroom rules and in solving classroom problems through democratic action.
- Self-control cannot be learned through being controlled. You teach in a manner that causes students to control themselves and that enables them to learn self-discipline. The better we know them, the better we can teach them.
- Discipline does not mean punishment or its counterpart, reward. Punishment has an extremely limited value and is generally counterproductive to most of our educational goals. Its effects are only temporary. Punishment often leads to negative responses including stress, resentment, anger, aggression, deception, withdrawal, vandalism, violence or retaliation.
- A caring and supportive climate is conducive to the learners. The school administrators should pay particular attention to the building of a professional, less bureaucratic, and humanized work environment which will nurture a caring and supportive climate among the teachers.
- Teachers should develop scientific attitude among students to enhance academic achievement in science.
- Learning habits to combat academic stress can bring benefits beyond the classroom. If students can learn to perform up to their ability in school, the same anxiety-easing techniques can make them better prepared for job interviews, business presentations, or other stressful tasks in life.

- Family support is helpful for students facing stress, no matter how well they are adaptable to the stress.
- Ensure that opportunities are provided for academic challenge within your classroom. High ability students need to be given assignments that challenge them intellectually and enable them to use higher order processes and skills.
- Provide opportunities for students to pursue topics of interest through independent projects. Instead of providing "busy work" for students who complete assignments before everyone else, allow them to investigate topics outside the curriculum that they find stimulating.
- Help underachieving students set realistic goals that they can eventually reach.

Avoid comparing students to others in a competitive atmosphere. Stress your belief that these students can be successful and that you believe they have the potential to do well. Encourage students to pursue out of school interests. Underachievers may begin to realize there is a relationship between their interest areas and academic content.

Suggestions for Teachers

Teacher Classroom Control Means Student Self-Control. The reward-punishment system simply cannot produce self-directed, responsible, independent students. Classroom management, classroom control and classroom discipline are absolutely essential if students are to achieve the educational goals. But, those educational goals must include the promotion of autonomous, responsible, self-disciplined, independent, productive, problem-solving, decision-making, intelligent-thinking, self-directing, continuously learning individuals. It is very necessary to create democratic school environment at every level to reduce academic stress and to enhance academic achievement in science.

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