

## **IDENTIFICATION OF UNDERACHIEVERS, NORMAL ACHIEVERS AND OVERACHIEVERS IN SCIENCE**

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### **ABSTRACT**

Underachievement refers to the case that a student attains a level of achievement that is below his or her potential. Academic under-achievement can also be attributed to relatively intelligent or gifted students, who do not perform as expected either because they are bored or choose not to excel. The pilot study was carried out on 1684 students of 9<sup>th</sup> standard selected randomly from 18 secondary schools of Faridabad district of Haryana. Achievement test in science prepared and standardized by the investigator was administered to know the achievement of 9<sup>th</sup> standard students in science subjects. Thereafter, Advance Progressive Matrices Set I and Set II developed by J.C. Raven were administered to the same students to measure their intelligence. The raw scores of achievement test in science and intelligence test were converted into standard scores. All those students who obtained at least 1  $\delta$  less score on achievement tests in science in comparison to the score obtained in intelligence test were counted. Thus 402 students were selected as underachievers in science. Descriptive statistics and t-test were used to analysis the data. The result revealed that there is a significant difference in the ratio of underachievers in science among the students studying in Government and Government -Aided schools.

**KEYWORDS:** Underachievers, Normal Achievers, Overachievers, Academic Achievement

### **INTRODUCTION**

The demand for more science-trained workers appears to be real. Students bring the legacy of their cultural backgrounds to their studies. They have all experienced science learning outside the classroom and can form and express their own views. This means that they have their own attitudes towards science education and attention must be paid to them.

Unless school science explicitly engages with the enthusiasms and concerns of the many groupings that make up today's students, it will lose their interest. Accordingly, it needs to grapple with how it can respond positively to the wide diversity of student concerns.

Students of school age spend about two-thirds of their waking lives outside formal schooling. Yet science educators tend to ignore the crucial influences that experiences outside school have on students' beliefs, attitudes and motivation to learn. They often see these influences only as a source of misconceptions.

Science is a process as well as a product. The purpose of teaching and learning Science is specifically to produce three kinds of intellectual capital: Scientists, engineers and technological proficient workers who are capable of dealing with the demands of a science-based high technology workforce and scientifically literate citizens.

## UNDERACHIEVERS IN SCIENCE

Achievement means the amount of knowledge gained by the students in a subject or different subjects of study. The success or failure of a student is measured in terms of academic Achievement. Academic underachievement occurs when a person's actual academic achievement is significantly lower than their predicted achievement levels developed on the basis of scholastic aptitude and intelligence tests. Underachievement refers to the case that a student attains a level of achievement that is below his or her potential. Underachievement can be defined as an inability or failure to perform appropriately for one's age or talents, i.e. unfulfilled potential. If the students achieve below their potential in a science subject, this is called as Underachievers in Science. Underachievers and high achievers may have the same IQ, but they differ in their academic achievement. There may be many factors responsible for academic underachievement. These factors may be classified into three categories:

Personal factors: Self-esteem, motivation, self-regulation, cognitive strategy, mental health, and coping strategies are the personal factors which affect academic achievement of students.

Home factors: Socioeconomic status, specific and general parenting, sibling relations and parents' mental health are home factors which affect academic achievement of students.

School factors: school environment, classroom condition, use of teaching aid, projection of teaching material, teaching method and student-teacher relation etc. are the school factors which affect academic achievement of students.

Though the real causes are not known why some students do poorly in science subjects, yet it has become the moral duty of educators to diagnose the causes of Identification of Underachievers, Normal Achievers and overachievers in Science and find out ways and methods to enhance academic achievement of underachievers.

## NEED AND SIGNIFICANCE OF THE STUDY

The world is becoming more and more competitive. Quality of performance has become the key factor for personal progress. School plays an important role in molding the personality of children. Science education increases students' critical thinking and problem-solving skills and provides explanations of "why things work the way they do". Academic achievement in science depends on many factors such as infrastructure, science lab, scientific attitude, teaching methods etc. Though science is a living and interesting subject in schools still students underachieves in it. Therefore, this is the cardinal problem before educationists is to help each student to achieve his/her optimum especially in science subjects. Thus, the need for exploring the causal factors scientifically, relating to the identification of underachievers, normal achievers and overachievers in science.

## STATEMENT OF THE PROBLEM

The title of the study is given as "*Identification of Underachievers, Normal Achievers and overachievers in Science*".

## OBJECTIVES OF THE STUDY

The following objectives have been framed in the study:

- To identify underachievers in science.

- To identify normal achievers in science.
- To identify overachievers in science.
- To find out the ratio of male and female underachievers in science from secondary school students.
- To find out the ratio of underachievers in science between Government and Government-Aided secondary school students.

## HYPOTHESES

Keeping in view the variables and the objectives, the following corresponding hypotheses have been formulated in NULL form.

- There is no significant difference between the ratio of male and female underachievers in science from secondary school students.
- There is no significant difference between the ratio of underachievers in science of Government and Government-Aided secondary school students.

## RESEARCH DESIGN

The study is correlational. Identification of underachievers, normal achievers and overachievers in science was done through conversion of raw data on achievement in science and the score of intelligence test of students. The achievement test in science prepared and standardized by the investigator himself was administered to 1684 students of class IX of various Government and Government-Aided Schools of Faridabad, to measure their achievement in Science. Thereafter, Advance Progressive Matrices Set I and Set II developed by J.C. Raven were administered to the same students to measure their intelligence. The raw scores of achievement test in science and intelligence test were converted into standard scores. The difference of scores of achievement test in science and intelligence test was calculated. All those students who obtained at least 1  $\delta$  less score on achievement tests in science in comparison to the score obtained in intelligence test were counted. Thus 402 students were selected as underachievers in science. The analysis of underachievers, normal achievers and overachievers in science is given below.

## ANALYSIS AND INTERPRETATION OF DATA

Table 1 shows the number and percentage of students belonging to various categories of academic achievement in a science subject at secondary school level.

**Table 1: Number and Percentage of Students Belonging to Various Categories of Academic Achievement in Science Subject**

S.N.	Category	No. of Students	Percentage	Remarks
1	Underachievers	402	23.87	At least 1 $\delta$ less score in achievement test in science than in intelligence tests.
2	Normal Achievers	1080	64.14	Difference of scores in achievement test and in intelligence test should not be greater than 1 $\delta$ .
3	Overachievers	202	11.99	At least 1 $\delta$ more score in achievement test than in intelligence tests
<b>Total</b>		<b>1684</b>	<b>100</b>	

On analyzing the scores of achievement test in science and intelligence test of 1684 secondary school students it can be concluded that 402 (23.87%) of the students were found in the category of underachievers in science, whereas 1080 (64.14%) students were found to be in the category of normal achievers and only 202 (11.99%) students were over achievers in science at secondary school level.

### Comparison between Male and Female Underachievers of Secondary Schools

Table 2 presents a summary of the comparison between the number of male and female underachievers in science along with the percentage.

**Table 2: Number and Percentage of Male and Female Underachievers in Science**

S. No	Category	No. of Students	Percentage
1	Male	211	52.48
2	Female	191	47.51
<b>Total</b>		<b>402</b>	<b>100</b>

On analyzing the scores of achievement test in science of 402 underachievers in science of secondary school students it can be concluded that 211 (52.48%) of male students were found in the category of underachievers in science, whereas 191 (47.51%) female students were found to be in the category of underachievers in science.

### Comparison of Academic Achievement between Male and Female Underachievers of Secondary Schools

Table-3 presents a summary of the comparison made between male and female underachievers in science with respect to mean, standard deviation and t-ratio of Achievement in science.

**Table 3: Comparison of Achievement in Science between Male and Female underachievers of Secondary Schools**

Gender	N	Mean	S.D.	T-Ratio	Remarks
Male	211	21.84	5.43	0.432	Insignificant
Female	191	21.10	5.21		

The mean of male and female underachievers in science in secondary schools in term of achievement in science was found to be 21.84 and 21.10 respectively. Since the derived combined t-ratio for achievement in science between male and female was found to be 0.432, which is not significant at 0.05 and 0.01 levels of significance. The finding shows that the male and the female underachievers in science are similar in their achievement in a science subject.

### Comparison of Academic Achievement between Male and Female Underachievers of Secondary Schools

**Table 4: Comparison of Achievement in Science between Government and Government-Aided Secondary Schools Students**

Type of Schools	N	Mean	S.D.	T-Ratio	Remarks
Government Secondary School Students	202	19.96	4.35	10.97	Significant
Government-Aided Secondary School Students	200	24.98	4.79		

The mean of achievement in science 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 achievement in science between underachievers in science of Government-Aided Schools and Government schools was found to be 10.97, 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 better in academic achievement in science subject.

## MAIN FINDINGS OF THE STUDY

### The Important Findings are given below

- Out of 1684 students there were 23.87% students were underachievers in science where as 64.14% students were normal achievers and only 11.99% students were over achievers in science at secondary school level.
- Out of 402 underachievers in science of secondary school students 211 (52.48%) of male students and 191 (47.51%) female students were found to be in the category of underachievers in science.
- There was no significant difference between male and female underachievers in science in secondary schools with respect to achievement in science.
- The mean score between achievement in the science of the Government-Aided and Government school students differed significantly. Hence it is clear that the Government- Aided schools provide better facilities for science education in comparison to the Government Schools.
- Based on the results of this study, it is concluded that there is a need to include concept mapping with the constructivist basis as one of the major approaches to teach science in schools and provide workable strategies to help students “learn how to learn”.

## CONCLUSIONS

Out of 1684 students there were 23.87% students were underachievers in science where as 64.14% students were normal achievers and only 11.99% students were over achievers in science at secondary school level. Out of 402 underachievers in science of secondary school students 211 (52.48%) of male students and 191 (47.51%) female students were found to be in the category of underachievers in science. There is no significant difference between academic achievement in science of male and female underachievers in science. Still, school environment affects academic achievement in science of the students. It means providing better facilities for science education in school 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 a practical and amiable environment for science education.

## SUGGESTIONS FOR TEACHERS

Teacher Classroom Control Means Student Self-Control. The reward-punishment system simply cannot produce self-directed, responsible, independent students. Providing appropriate atmosphere for science education is absolutely essential if students are to achieve the educational goals in science subjects. 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 a democratic school environment at every level for better teaching and learning of science to enhance academic achievement in science.

## IMPLICATIONS AND CONSIDERATIONS

- Classroom environment continues to evolve with the development of online courses and increased use of technology in learning situations.
- Science can be taught to students, enabling them to interact via email, video conferencing, and blogs. Information gained from ongoing studies of classroom environment for science teaching continues to impact teachers' knowledge.
- Learning about factors that may shape students' perceptions of their science learning environment, how teachers' actions appear to students, and how changes made to the learning environment may stimulate and encourage learning science continue to be of the utmost importance to teachers.
- Students need to participate in handling of science equipments determining the classroom rules and in solving classroom problems through democratic action.
- Encouragement is most important. Without mutual respect, trust, and caring, there is not likely to be any real learning going on. So, love your students and give them appropriate encouragement for science learning.

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