

Achievement in Science among Higher Secondary School Students: A Comparative Study between Mizoram and Meghalaya

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Abstract

The present study compares the achievement in science among higher secondary school students in Mizoram and Meghalaya. Data is collected randomly from a sample of six hundred (600) higher secondary students, 300 from Mizoram, and 300 from Meghalaya. Results indicate that majority of the students have an average achievement in science and the students of Mizoram have higher achievement in science than the students of Meghalaya. The results further showed that male students were higher than female students in science achievement in both the states. The overall achievement in science was moderate for both the states, which calls for more considerable attention from parents and teachers for better results.

Keyword: Achievement in Science, Higher Secondary School Students

Date of Submission: 06-06-2021

Date of acceptance: 20-06-2021

I. Introduction:

Achievement is of paramount importance for progress and promotion in any field. Students with a higher level of academic performance have the option to avail themselves of better lines and better jobs in all areas like science and technology, medicine, management, literature, education. It can prove to be the propelling force in upward mobility in individuals or families' socioeconomic status since it can allow for access to better professional opportunities. It is also an indicator of the overall effectiveness of any institution and is often used to assess the quality of education in society. Academic achievement therefore is an essential factor that determines students' future success and career trajectories.

The improvement and promotion of achievement in science among students should become a matter of priority in education. At the same time, the quality of science education has to be continuously advanced and improved. Students with higher achievements in science have access to better professional opportunities as they tend to possess scientific knowledge and skills that enable them to make a positive contribution to the scientific community's successes. The academic environment should nurture the students' potentials and talents to perform well and succeed. Therefore, a student with a scientific aptitude and a positive attitude toward science should be encouraged and nurtured to develop and enhance their potential to ensure that he succeeded in pursuing scientific research and careers in science. Therefore, policymakers, administrators, and all stakeholders should be aware of this and positively enhance science achievement.

Students tend to perform well and succeed if placed in an academic environment where their potential and talents are nurtured. Several factors influence student achievements, such as the quality of education concerning schools and teachers, the curriculum, students' socio-economic background, attitude, and aptitude, amongst others. Teachers have a significant role in enhancing students' achievement in science through the motivation, encouragement, and support they provide and by raising the quality of instruction and knowledge they impart to them.

RATIONALE OF THE STUDY:

Even though the states of Mizoram and Meghalaya have great potential for scientific and technological advancements, their contributions toward advancements in science and technology in the country are few compared to other Indian states. Therefore, it becomes imperative to discover the factors that influence achievement in science. A detailed study on this population will help educators know why students' performance in science in both states is far from satisfactory and access the quality of the school education system and discover areas needed for improvement.

OBJECTIVES:

- 1 To find out the achievement in science among higher secondary school students of Mizoram and Meghalaya.
- 2 To find out the achievement in science among higher secondary school students of Mizoram.
- 3 To find out the achievement in science among higher secondary school students of Meghalaya.
- 4 To compare the achievement in science between higher secondary school students of Mizoram and Meghalaya.
- 5 To compare the achievement in science among higher secondary school students of Mizoram and Meghalaya with reference to gender.
- 6 To compare the achievement in science among higher secondary school students of Mizoram with reference to gender.
- 7 To compare the achievement in science among higher secondary school students of Meghalaya with reference to gender.
- 8 To compare the achievement in science between female higher secondary school students of Mizoram and Meghalaya.
- 9 To compare the achievement in science between male higher secondary school students of Mizoram and Meghalaya.

HYPOTHESES:

1. There is no significant difference in the achievement in science between higher secondary school students of Mizoram and Meghalaya.
2. There is no significant difference in the achievement in science among higher secondary school students of Mizoram and Meghalaya with reference to gender.
3. There is no significant difference in the achievement in science among higher secondary school students of Mizoram with reference to gender.
4. There is no significant difference in the achievement in science among higher secondary school students of Meghalaya with reference to gender.
5. There is no significant difference in the achievement in science between female higher secondary school students of Mizoram and Meghalaya.
6. There is no significant difference in the achievement in science between male higher secondary school students of Mizoram and Meghalaya.

II. Methodology:

The present study applied a causal-comparative status survey design. It is keeping in view the main objective of finding out the achievement among higher secondary school students in Mizoram and Meghalaya.

Tool used:

Achievement Test in Science (ATS-GR) developed by S.C. Gakhar and Rajnish (2004).

Population:

The population for the present study consists of all the higher secondary science students in Mizoram and Meghalaya studying under Mizoram Board of School Education (MBSE) and Meghalaya Board of School Education (MBOSE).

Sample:

The sample consists of 600 higher secondary students, 300 from Mizoram, and 300 from Meghalaya. There are 300 males and 300 females.

ANALYSIS OF DATA:

The data collected using achievement test in science were tabulated and analysed, keeping in mind the objectives and hypotheses of the study.

Objective No. 1: To find out the Achievement in Science among Higher Secondary School Students of Mizoram and Meghalaya:

The scores of higher secondary school students of Mizoram and Meghalaya on the 'Achievement Test in Science (ATS-GR)' were scored and tabulated. The scores above the 75th percentile constitute high achievement in science, those between the 25th and 75th percentile constitute an average achievement in science, and those below the 25th percentile constitute low achievement in science. The following table - 1 shows the distribution of all the students in their achievement in science.

Table No – 1
Achievement in Science among Higher Secondary School Students of Mizoram and Meghalaya:

Achievement in Science	Score Range	Total (N=600)	
		No of Students	Percentage
High Achievement	20-32	159	26.5%
Average Achievement	14-19	310	51.67%
Low Achievement	5-13	131	21.83%

A look at the table - 1 reveals that out of the total sample of 600 higher secondary school students of Mizoram and Meghalaya, there were 159 students (26.5 %) who possessed high achievement in science, 310 students (51.67 %) with an average achievement in science, and 131 students (21.83 %) who have low achievement in science. Hence, majority of the students possessed an average achievement in science. The numbers of students with high achievement in science are somewhat more in numbers than those with low achievement in science.

Objective No. 2: To find out the Achievement in Science among Higher Secondary School Students of Mizoram

The scores obtained from ‘Achievement Test in Science’ were scored, tabulated and classified. Based on their responses, the students of Mizoram were classified into three groups. The following table - 2 shows the distribution of higher secondary school students of Mizoram in their achievement in science.

Table No. 2
Achievement in Science among Higher Secondary School Students of Mizoram:

Achievement in Science	Score Range	Total (N=300)	
		No of Students	Percentage
High Achievement	20-32	100	33.33%
Average Achievement	14-19	167	55.67%
Low Achievement	5-13	33	11%

It is clear from the above table - 2 that out of the total sample of 300 higher secondary school students of Mizoram, 100 students (33.33 %) have high achievement in science, 167 students (55.67 %) have an average achievement in science, and 33 students (11 %) have low achievement in science. So, the majority of the students have an average achievement in science. The numbers of students with high achievement in science are more in numbers than those with low achievement in science.

Objective No. 3: To find out the Achievement in Science among Higher Secondary School Students of Meghalaya.

The scores obtained from the ‘Science Achievement Test’ were scored and tabulated. Based on their responses to the Science Achievement Test, the students of Meghalaya were classified into three groups. The following table - 3 shows the distribution of higher secondary school students of Meghalaya in their achievement in science.

Table No. 3
Achievement in Science among Higher Secondary School Students of Meghalaya:

Achievement in Science	Score Range	Total (N=300)	
		No of Students	Percentage
High Achievement	20-32	59	19.67%
Average Achievement	14-19	143	47.67%
Low Achievement	5-13	98	32.66%

Table No – 3 shows that out of 300 higher secondary school students of Meghalaya, 59 (19.67 %) students have high achievement in science, 143 (47.67 %) students have an average achievement in science, and 98 (32.66 %) students have low achievement in science. Hence, the majority of the students have an average achievement in science. The numbers of students with low achievement in science were slightly more in number than those with high achievement in science.

Objective No. 4: To compare the Achievement in Science between Higher Secondary School Students of Mizoram and Meghalaya.

The comparison of the achievement in science between higher secondary school students of Mizoram and Meghalaya involves the calculation of the mean and standard deviation of both the groups. The t-value established determines the significance of difference and the nature of the difference between the two groups.

The hypothesis (No.1) states: “There is no significant difference in the achievement in science between higher secondary school students of Mizoram and Meghalaya.” Table - 4 shows the comparison in the achievement in science between higher secondary school students of Mizoram and Meghalaya.

Table No. 4
Comparison of Achievement in Science between Higher Secondary School Students of Mizoram and Meghalaya

State	N	Mean	SD	MD	SEMD	t-value	Sig.level
Mizoram	300	18.00	4.238	2.000	.364	5.493	**
Meghalaya	300	16.00	4.670				

***means significant at 0.01level.*

Looking at table - 4, the ‘t’ value for the significance of the difference between the mean scores of higher secondary school students of Mizoram and Meghalaya in their achievement in science is 5.493. Since the calculated ‘t’ value is greater than the criterion ‘t’ value, the difference in the achievement in science between higher secondary school students of Mizoram and Meghalaya is significant. Therefore, the null hypothesis (No.1) that states there is no significant difference in the achievement in science between higher secondary school students of Mizoram and Meghalaya was rejected as a significant difference was found at 0.01 level. A comparison of their mean scores indicates that students of Mizoram have higher achievement in science compared to the students of Meghalaya.

Objective No. 5: To compare the Achievement in Science among Higher Secondary School Students of Mizoram and Meghalaya with reference to gender.

The hypothesis (No 2) states: “There is no significant difference in the achievement in science among higher secondary school students of Mizoram and Meghalaya with reference to gender.” Table - 5 shows the comparison in the achievement in science of higher secondary school students of Mizoram and Meghalaya with reference to gender.

Table No. 5
Achievement in Science among Higher Secondary School Students of Mizoram and Meghalaya with reference to Gender.

State	N	Mean	SD	MD	SEMD	t-value	Sig. level
Male	300	17.41	5.144	.820	.372	2.206	*
Female	300	16.59	3.869				

Table - 5 reveals that the ‘t’ value for the significance of difference between the mean scores of male and female students in their achievement in science is 2.206. Since the calculated ‘t’ value is above the criterion ‘t’ value, this shows that there is a significant difference in the achievement in science among higher secondary school students of Mizoram and Meghalaya with reference to gender. Therefore, the hypothesis (No.2) that states there is no significant difference in the achievement in science among higher secondary school students of Mizoram and Meghalaya with reference to gender was rejected as a significant difference was found at the 0.05 level of confidence. A comparison of the mean scores of males (17.41) and females (16.59) reveal that since male students of both the states have a higher mean score, their achievement in science was definitely higher than that of the female students of both the states.

Objective No. 6: To compare the Achievement in Science among Higher Secondary School Students of Mizoram with reference to gender.

Hypothesis (3) states: “There is no significant difference in the achievement in science among higher secondary school students of Mizoram with reference to gender”. Table No.6 displays the comparison of the achievement in science of higher secondary school students of Mizoram with reference to gender.

Table No. 6
Achievement in Science among Higher Secondary School Students of Mizoram with reference to Gender.

State	N	Mean	SD	MD	SEMD	t-value	Sig. level
Male	150	18.58	4.997	1.153	.486	2.375	*
Female	150	17.43	3.224				

** means significant at .05 level.*

Table No. 6 reveals that the 't' value for the significance of the difference between the mean scores of male and female students of Mizoram in their achievement in science is 2.375. Since the calculated 't' value is greater than the criterion 't' value, there is a significant difference in the achievement in science among higher secondary school students of Mizoram with reference to gender. Therefore, the null hypothesis (No.3) that states there is no significant difference in the achievement in science among higher secondary school students of Mizoram with reference to gender was rejected since a significant difference was found at 0.05 level. A comparison of the mean scores of males (18.58) and females (17.43) reveals that since males have a higher mean score, their achievement in science was found to be higher than that of females.

Objective No. 7: To compare the Achievement in Science among Higher Secondary School Students of Meghalaya with reference to gender.

The hypothesis (No.4) states: "There is no significant difference in the achievement in science among higher secondary school students of Meghalaya with reference to gender." Table No.7 shows the comparison of achievement in science of higher secondary school students in Meghalaya with reference to gender.

Table No. 7
Achievement in Science among Higher Secondary School Students of Meghalaya with reference to Gender

State	N	Mean	SD	MD	SEMD	t-value	Sig. level
Male	150	16.25	5.144	.487	.539	.902	NS
Female	150	15.76	3.869				

NS means significant.

Looking at table - 7 it was found that the 't' value for the significance of the difference between the mean scores of male and female students of Meghalaya in their achievement in science is .902, whereas the required 't' value with df = 298, to declare the difference as significant is 1.97 at 0.05 level of confidence. Since the calculated 't' value is lower than the criterion 't' value, there exists no significant difference in the achievement in science among higher secondary school students of Meghalaya with reference to gender. Therefore, the null hypothesis (No.4) that there is no significant difference in the achievement in science among higher secondary school students of Meghalaya with reference to gender was accepted.

Objective No. 8: To compare the Achievement in Science between Female Higher Secondary School Students of Mizoram and Meghalaya

The hypothesis (No 5) states: "There is no significant difference in the achievement in science between female higher secondary school students of Mizoram and Meghalaya." Table – 8 shows the comparison in the achievement in science between female higher secondary school students of Mizoram and Meghalaya.

Table No. 8
Achievement in Science between Female Higher Secondary School Students of Mizoram and Meghalaya

State	N	Mean	SD	MD	SEMD	t-value	Sig. level
Mizoram	150	17.43	3.224	1.667	.437	3.814	**
Meghalaya	150	15.76	4.272				

Results as shown in table - 8 reveals that the 't' value for the significance of the difference between the mean scores of female higher secondary school students of Mizoram and Meghalaya in their achievement in science is 3.814. Since the calculated 't' value is greater than the criterion 't' value, there is a significant difference in the achievement in science between female higher secondary school students of Mizoram and Meghalaya. Therefore, the null hypothesis (No.5) that there is no significant difference in the achievement in science between female higher secondary school students of Mizoram and Meghalaya was rejected since the significant difference occurred at the 0.01 level. On comparing their mean scores, the female students of Mizoram have higher achievement in science compared to female students of Meghalaya.

Objective No. 9: To compare the Achievement in Science between Male Higher Secondary School Students of Mizoram and Meghalaya.

The hypothesis (No.6) states: "There is no significant difference in the achievement in science between male higher secondary school students of Mizoram and Meghalaya." Table No.9 shows the comparison of achievement in science between male higher secondary school students of Mizoram and Meghalaya.

Table No. 9

Achievement in Science between Male Higher Secondary School Students of Mizoram and Meghalaya

State	N	Mean	SD	MD	SEMD	t-value	Sig. level
Mizoram	150	18.58	4.997	2.333	.579	4.027	**
Meghalaya	150	16.25	5.039				

** means significant at .01 level

Table - 9 shows that the 't' value for the significance of the difference between the mean scores of male higher secondary school students of Mizoram and Meghalaya in their achievement in science is 4.027. Since the calculated 't' value is greater than the criterion 't' value, there is a significant difference in the achievement in science between male higher secondary school students of Mizoram and Meghalaya. Therefore, the null hypothesis (No.6) that there is no significant difference in the achievement in science between male higher secondary school students of Mizoram and Meghalaya was rejected since a significant difference occurred at the 0.01 level. A comparison of the mean scores of male students of Mizoram and Meghalaya reveals that since male students in Mizoram have a higher mean score, their achievement in science is higher than that of male students in Meghalaya

III. Suggestions:

- It is essential to improve the competence of science teachers at all levels, as teachers' quality will determine students' achievement level. The teachers can motivate students, inculcate a positive attitude toward science, identify students' scientific aptitude, draw out pupils' interest, and help enhance their achievements in science.
- Schools must have well-equipped infrastructure and facilities to impart science education to serve each student's needs. If students have more exposure to well-equipped laboratories, sound libraries, audio-visual aids, among others, it will serve as a positive enhancement to their educations.
- Students have a better understanding of scientific ideas and concepts when taught in their native language, which could help ensure achievement for the students. In this regard, the use of the mother tongue should be encouraged and promoted sensibly.
- Students need motivation and proper guidance to prevent increased exposure to distractions, such as social media and online games, which often impede progress in their studies.
- Youth contribute to the church and in the local community. There are numerous events and activities in which society expects the youth to participate. Participation in such local activities and events, while not compulsory, are integral in a community-based society such as the ones in Mizoram and Meghalaya. It has often been observed that excessive involvement in such practices can have a detrimental effect on the pursuit of studies, leading to poor academic results. As such, parents and society should take caution to see that the youth's participation in the local community's activities does not negatively affect their studies.

IV. Conclusion:

The overall achievement in science was moderate for both the states, which calls for more considerable attention from parents and teachers for better results. The students of Mizoram fare better overall in terms of achievement in science. Male students were higher than female students in terms of achievement in science in both states.

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Lalmuanzuali. "Achievement in Science among Higher Secondary School Students: A Comparative Study between Mizoram and Meghalaya." *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 11(3), (2021): pp. 30-36.