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A STUDY OF ACHIEVEMENT IN SCIENCE AMONG HIGHER SECONDARY SCHOOL STUDENTS OF AIZAWL

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Abstract: The main purpose of the present study is to find out the level of science achievement among higher secondary school students and compare achievement between; male and female; government, deficit and private schools. This study is very important because, the first National Achievement Survey which was conducted by NCERT in 2015 reported that the average performance of class X students in the State was significantly lower than the National average in Science subject and stated that the need for improvement of 64.8 % in the said subject. Further, it was reported in the study of Regional Plan and Status of Science Education in Schools in North Eastern Region (NER, 2016-17) by NEDFi with IIT Guwahati & Homi Bhabha Centre for Science education, TIFR, Mumbai that the performance of students in Science in the NE region was a cause for concern and the State scored lower than the regional average. Achievement test in Science developed and standardized by Dr SC Gakhar and Dr Rajnish was employed and distributed to 298 students from the government, deficit and private schools. Primary and secondary data were analyzed by using SPSS Statistics for Windows, Version 17.0. Level of achievement in Science among higher secondary students was very low, 95.64% fell under below average level. No significant difference in Science achievement was found between female and male students. Moreover, there was no significant difference between government and private school students, but there existed a significant difference between deficit and government as well as deficit and private schools. Students from deficit school outperformed both government and private schools. The author suggested that science teachers should use collaborative-learning activities and social modelling to promote students' interest, motivation, and achievement in science career. Learner-centered teaching-learning methodologies such as activity-based learning and laboratory experiments in Science should be employed to build students attitudes towards Science subject.

Key words: Science education, higher secondary stage, achievement test, National achievement survey.

I. INTRODUCTION

The Education Commission (1964-66) was of the opinion that science education must become an integral part of school education. The Commission felt that the quality of science teaching at all levels in the country has to be raised considerably so as to achieve its proper objectives and purposes such as, to promote an ever-deepening understanding of basic principles; to develop problem solving and analytical skills and ability to apply the skills to the problems of the material environment and social living; and to promote the spirit of enquiry and experimentation.

In Mizoram, the higher secondary schools came into existence only in the year 1996 when the Pre-University class (equivalent to Class XI and XII) was shifted from colleges to schools. Darchhingpuii (1988) mentioned that there was a scarcity of science teachers, and schools were lacking in facilities like laboratory, teaching aids, equipment and even literature for the proper teaching of Science. In the past years, Science was a neglected subject but now through the State and Central government policy there are many innovations which are easily noticeable. At the same time as compared to National standard, science education in Mizoram seems to have relative drawbacks. The overall picture of science education is not very encouraging till today. However, Government of Mizoram made much effort for the promotion of science education. A separate science promotion wing has been created under the Directorate of Education for the very purpose.

According to National Achievement Survey (NAS, 2015) conducted by National Council of Education Research and Training (NCERT) for Class X students (same batch of the present study) in the subject i.e. Science; it was reported that, average performance of students in the state i.e. Mizoram was significantly lower than the national average. Again, study report on 'Regional Plan and Status of Science Education in Schools in North Eastern Region (NER) by North Eastern Development Finance Corporation Ltd. (NEDFi) with Academic Inputs from Indian Institute of Technology Guwahati (IITG) & Support from Homi Bhabha Centre for Science Education, TIFR, Mumbai, October 2017 shows the level of the state in comparison with the neighbor state. In Nagaland, Meghalaya and **Mizoram**; the average scores were lower than the regional average.

In recent years, scholars have shown interest in the relationship of gender participation and performance in Science. Research has proceeded on many fronts, from the examination of differences between boys and girls on cognitive-ability measures (Lowell, 1980) and on primary-grade science activities, thought to be related to aptitude for Science (Ormerod *et al.*, 1979), to the study of differential participation in scientific careers and higher education in Science (DeBoer, 1984). Many researchers have examined the relationship of gender to measures of science achievement. Often this was done only incidentally in the course of studying other treatment effects or group differences (Hart, 1978; Keeves, 1975). The school has long been recognized as a selective socializing agency. Most of the studies indicate the importance of educational environment provided by the schools in the promotion of better student performance. But, the question still remains as to which type of schools affects the achievement and to what extent. The Higher Secondary schools in the state of Mizoram fall under three main categories, the government schools, private schools and deficit schools. There is plenty evidence to infer that the sex differences and the school situation are significant factors affecting the achievement.

It appears that not much work has been done in investigating the variables like sex and type of school in science achievement in Mizoram. The study assumes important as it examines the ability to understand the concept concerning Science among the higher secondary school students. The investigation of the related aspects of Science are much needed in a remote backward area like Mizoram as the State still lags behind in industrial and scientific advancements. The findings of this research will be helpful for teachers for proper guidance of the students. It is also envisaged that the research will also give meaningful insights for developing programmed for propagation of Science in this area.

1.3 Statement of problem

The problem will be entitled as: "A study of Achievement in Science among Higher Secondary School Students of Aizawl"

1.4 Operational definitions

Achievement in Science: Achievement is the action of accomplishing something. Achievement in Science refers to something which is accomplished in the field of science education. In the present study, science achievement has been taken as the accomplishment in Science (Physics and Chemistry) by the scores obtained by the higher secondary students on an objective test in Science.

Higher Secondary School: Higher secondary school is an educational institution where the last stage of the three schooling periods, known as higher secondary education. Higher secondary education mainly followed by University (tertiary) education. In the proposed study, higher secondary school means the school which runs standard XI and XII level in Aizawl.

Students: Students means person who is studying at a school or college. One who studies or examines in any manner an attentive and systematic observer; as, a student of human nature or physical nature. In the present study, students mean a person who is studying in XI and XII Sciences of higher secondary schools in Aizawl, Mizoram.

1.5 Objectives of the study

The study has to be conducted keeping in view of the following objectives:

1) To study the achievement level in Science among higher secondary school students of Aizawl.
2) To compare the achievement of male and female students of higher secondary school students of Aizawl.
3) To study the difference between government and private school students of higher secondary school in achievement in Science.
4) To study the difference between government and deficit school students of higher secondary school in achievement in Science.
5) To study the difference between private and deficit school students of higher secondary school in achievement in Science.

1.6 Hypothesis of the study

To fulfill the objective of this study the researcher has formulated the following null hypotheses:

1) There exists no significant difference between male and female students in achievement in Science.
2) There exists no significant difference between government and private school students of higher secondary school in achievement in Science.
3) There exists no significant difference between government and deficit school students of higher secondary school in achievement in Science.
4) There exists no significant difference between private and deficit school students of higher secondary school in achievement in Science.

1.7 Delimitations of the study

1) The study is delimited to the school located in the city of Aizawl Municipal area.
2) The study is delimited to students of standard XII science of the higher secondary schools of Aizawl city.

II. REVIEW OF RELATED LITERATURE

Study abroad

In 1974, Maccoby & Jacklin reported that in the science classroom, girls perform as well, or better than boys reported from the study of the psychology of sex differences. However, Steinkamp & Maehr (1983) found that males achieved slightly higher in Science than do females and tend to possess slightly more cognitive ability. They also mentioned that in some content areas within Science, male demonstrate more positive effect than do girls; in other content areas the reverse is true. Linn (1991) studied gender differences in educational achievement and the authors found that standardized tests are thought to under-predict girls' science achievement. Kotte (1992), in an international comparative study of 10 nations, found significant gender differences across nations in science achievement, attitude toward Science, and science course taking, all in favor of males. We have other international comparisons Lapointe *et al.* (1989); Postlethwaite & Wiley (1992) indicating gender differences in science achievement across countries. Young & Fraser (1993) reported significant gender differences in science achievement even after adjusting for individual characteristics, family background, and school context.

Jovanovic *et al.* (1994) reported that females' and males' performances on standardized tests of science achievement begin to deviate with girls falling at the back boys. This fact is well supported by numerous large-scale studies such as the International Association for the Evaluation of Educational Achievement or IEA (1988), the National Assessment of Educational Progress (NAEP) 1970-1986 (Mullis *et al.*, 1988), and the British Columbia Science Assessments (Bateson & Parsons-Chatman, 1989). Beaton et al. (1996), conducted third International Mathematics and Science Study. It was the largest and most ambitious study ever undertaken by the International Association for the Evaluation of Educational Achievement. Forty-five countries collected data in more than 30 languages. In most countries and internationally, boys outperformed girls at both grade levels. Acar *et al.* (2015) examined 99 girls and 83 boys, results showed that girls outperformed boys on science achievement.

National

Darchhingpuii (1988) studied of science achievement, attitude towards Science and problem-solving ability among the secondary school students in Aizawl. She found that male students were superior in their science achievement to female students. However, there was no significant difference between students from government school and deficit school in science achievement. According to the study of impact of school location on academic achievement of science students in senior secondary school certificate examination by Agbaja *et al.* (2014), there was no statistical significant difference in the achievement mean scores of male and female students in the rural school areas and also there was no statistical significant difference in the achievement mean scores of male and female students in the urban school areas. Kaur *et al.* (2015) examined achievement in Science of senior secondary school student in Sangrur District of Punjab State. It was found that male and female students do not differ significantly on achievement in Science and no significant difference was found between rural and urban students on achievement in Science.

NAS, 2015 was conducted by NCERT for Class X students (same batch of the present study) reported that average performance of students in the state i.e. Mizoram was significantly lower than the national average in Science subject. Average performance of students from rural areas in the state does not differ significantly from those in urban areas in Science subjects. Average performance of girls in the state does not differ significantly from that of boys in Science subjects. Thus, there is need for improvement of 64.8 % in Science subject. There are no students who score 75 % and more in Science subject.

Class 12 Board Exam Result Analysis (2012-2017), the Result of class 12 Science stream Board exam during the last six years was analyzed and represent briefly as the following. In the year 2012, the overall pass percentage in Science stream was 59.46 %; in 2013-60.11 %; in 2014-76.34 %; in 2015-81.99 %; in 2016-76.87 %; and in the last academic session 2017 overall pass percentage was 81.4 %. Over the last six years the average pass percentage was 72.69. By comparing female and male passed percentage in Science stream, male performed slightly better in the year 2012 and 2013 by approximately 4 %. However, since 2014 till the last academic session, female students were superior than male regarding pass percentage. In considering Government, Deficit and Private school; Deficit school has the best pass percentage throughout these six years followed by Private and Government school. The average passed percentage over six years in Deficit school is 89.96 %; Private school 81.80 %: Government school 74.01 %.

Study report on 'Regional Plan and Status of Science Education in Schools in NER' by NEDFi with Academic Inputs from IITG & Support from Homi Bhabha Centre for Science Education, TIFR, Mumbai, October 2017. The performance of students in Science in the NE Region is a cause for concern. In Nagaland, Meghalaya and Mizoram; the average scores were lower than the regional average. In Manipur and Mizoram, students in the urban and rural areas are almost at par unlike their counterparts from the other states.

III. RESEARCH METHODOLOGY

3.1 Method of study

The present report attempts to study the achievement in Science among higher secondary school students of Aizawl. The objectives of the present study require survey and fact-finding inquiry relating to the achievement in Science among higher secondary school students. Therefore, descriptive type of research was employed for the present study.

3.2 Population and sample of the study

The population include all the class XII standard (students who just finish XI or XII newly admitted) science students studying in government, purely private and deficit higher secondary schools of Aizawl. In Aizawl city area, there are 21 science higher secondary schools out of which seven are government schools; 11 are private schools; three are deficit schools. Two government; one deficit; five private school were selected as the sample for the present study. The present population of the XII standard science students in Aizawl city is 1397 detailed given in table 3.2(a). The final samples of 298 students were taken out of 1397 students of Aizawl city as depicted in Table 3.2 (b).

Table 3.2 (a): Details of XII standard higher secondary school students of Aizawl

No. of School	Name of School	Contact	Address	No. of Class 11 Sc passed Stds
State Government				
1	Govt. Central HSS	2327010	College Veng	15
2	Govt. Chaltlang HSS	2341104, 9436154400	Chaltlang	54
3	Govt K M HSSS	2317239, 9436151282	Dawrpui Vengthar	64
4	Govt. MICE HSS	2325244, 9436140853	Venghlui	26
5	Govt. Mizo HSS	2341213, 9862742261	Zarkawt	90
6	Govt. Republic HSS	2340468, 8014536150	Ramthar	50
7	Govt. Zemabawk HSS	2351876, 9436149542	Zemabawk	70
			Total Govt. Stds	**369**
Deficit School				
1	Helen Lowry HSS	2345838, 9862323016	Vaivakawn	24
2	St. Pauls HSS	2322702, 9436142271	Tlangnuam	180
3	Synod HSS	2322889, 9436199520	Mission Vengthlang	110
			Total Deficit Stds	**314**
Private Unaided				
1	Boston HSS	9862598545, 9862375383	Mission Veng	90
2	Brighter HSS	9862364849, 9862325305	Kulikawn	20
3	Dawrpui School of Sc & Tech	2317560, 9436151293	Dawrpui	80
4	Greenland HSS	2342668, 9436140458	Chaltlang	140
5	Home Mission HSS	2306009	Zarkawt	80
6	KV Multipurpose HSS	9402172010, 9862386583	Durtlang	44
7	Mt Carmel HSS	2344090, 9436141385	Chaltlang	100
8	Oikos HSS	9436150345	Tuikhuahtlang	52
9	Providence HSS	2320846, 9436142569	Zarkawt	23
10	St Joseph HSS	9436197649, 8974159507	Ramhlun N	60
11	Staines Memorial HSS	2342261, 9436142159	Chanmari	25
			Total Pvt. Stds	**714**
			Total students	**1397**

Table 3.2 (b): Selected sample of the study

Categories	Number of Schools	Samples		Total no. of Students
		Male	Female	
Government	2	39	39	78
Private	1	25	25	50
Deficit	5	85	85	170
Total	**8**	**149**	**149**	**298**

3.3 Tools and techniques for data collection

For the purpose of finding out the level of achievement in Science of 12th standard students of higher secondary schools within Aizawl municipal area, the investigator used primary as well as secondary source.

3.3.1 Primary Source:

Achievement test in Science (ATS) developed and standardized by Dr S. C. Gakhar and Dr Rajnish published in 2011 was employed as the primary source of data collection for measuring the level of achievement in Science. The score obtained from the ATS (Dr S. C. Gakhar and Dr Rajnish) indicated the level of science achievement of higher secondary school students.

Description of the tools: The items prepared for the ATS were based upon the content of the class 11 and only that content was taken, which the students had already learnt. The test contains 65 multiple choice items (31 from Physics and 34 from Chemistry) corresponding to three concepts of Physics and five concepts of Chemistry. These concepts along with number of items representing each concept have given in table 3.3 (a). The test items were objectives and multiple-choice type with four options to each one of them. Only one response out of the four options was correct in each case.

Table 3.3 (a): Concept-wise allocation of items included in the preliminary draft of the test

Sr. No.	Name of the Concept	No. of Items
	PHYSICS	**31**
1.	Units and Dimensions	12
2.	Motion in One Dimension	10
3.	Motion in Two Dimension	9
	CHEMISTRY	**34**
1.	Atom	7
2.	Molecule	3
3.	Chemical Arithmetic	1
4.	State of Matter	12
5.	Atomic Structure	11
	TOTAL	**65**

Finally, instructions were carefully reviewed and modifications were done wherever necessary. The time limit of the test was fixed on the basis of the time taken by 90% of the students on the final try out, which was 50 minutes including 5 minutes for instruction. The correct answer key is provided and award 1 mark for each correct answer. For the purpose of having a better view of the achievement and for the interpretation of the level of achievement in Science, a z-Score norm is provided. There are 6 level of achievement i.e. very low, low, below average, average, above average, high and very high.

Reliability of the test: The present science achievement test reliability study was conducted over a sample of 30 students. The second administration of the test was given after a week. The product moment coefficient of correlation for the two scores was computed. The coefficient of correlation between two test scores was found to be 0.78. This coefficient of correlation is fairly high which testifies the soundness of the test.

Validity of the test: The present science achievement test was validated against the criterion of "content validity". The content validity is concerned with the adequacy of sampling of a specified universe of content. To determine content validity the test items and a list of outcomes were given to the panel consisting of eight experts in subject matter and six experts in test items. The panel was asked to identify which test items corresponds to which outcomes. The panel also completed the test so that scoring key could be verified. The experts agreed with the investigators on the assignment of test items to objectives 95 % of time and agreed with the scoring of the test 96 % of the time. This concurrence of percentage was taken as evidence of content validity.

3.3.2 Secondary Source:

The tools for collection of secondary sources of data were:

1. The enrolment records maintained by the District Education Office, Aizawl Districts.
2. School attendance records of each higher secondary school in Aizawl Municipal Area.
3. Mizoram Board of School Education HSSLC exam result book (2012-2017).
4. Report of NAS, 2015 conducted by NCERT.
5. Study report of Regional Plan and Status of Science Education in Schools in NER conducted by NEDFi With Academic Inputs from IITG & Support from Homi Bhabha Centre for Science Education, TIFR, Mumbai October 2017

3.3.3 Procedure of data collection

For the purpose of collecting data, the investigator personally visited the target schools (purely private, deficit and government school equal ratio) of Aizawl Municipal area and met the Head of Institutions as well as concerned teachers for permission of conducting achievement test. After getting permission from the school authority, the investigator explained the detailed description of the test tool to the students. After making familiar with the purpose and measurement of science achievement test, the science achievement test form were administered among the students by the investigator in equal proportion of female and male. The investigator also collected the details of age, gender from each and every student. In this approach all total 298 students from 8 higher secondary schools took part to the administered test.

3.3.4 Mode of data analysis

Tabulation of data: The data collected from 8 higher secondary schools of Aizawl municipal area were scrutinized and tabulated after scoring the responses of the sample group on the ATS using the answer key given in the manual. Each student was assigned a serial number. The scores of ATS were entered following column designed for each variable. These scores were classified, tabulated and analyzed the details are given in the results and discussion section. The analysis of the data was carried out with the help of appropriate scientific techniques, keeping in view the objectives of the study and findings were meaningfully interpreted.

Data analysis: For analyzing data, the statistical techniques such as mean, t-test, and Pearson product moment correlation were used by the investigator. Scoring of completely filled answer sheets was done and scores were used for statistical analysis. Mean was used for describing the central tendency. To compute the mean, all the raw scores are added which was divided by the number of students. t-test was used as the test of significance of the difference of the different aspects of science achievement. Pearson product moment correlation was used for finding out the relationship between the two different variables.

IV. RESULTS AND DISCUSSION

4.1 Level of Science Achievement of Higher Secondary school students of Aizawl

The levels of science achievement of the students were measured from the scores of the ATS by comparing with table 4.1 (a) given below:

Table 4.1 (a): Norms for interpretation of z-Scores for ATS levels

S/No.	Range of Raw Scores	Range of z-Scores	Level of Achievement in Science
1	36 and more	+2.01 and above	Very High
2	32 – 35	+1.26 to +2.00	High
3	28 – 31	+0.51 to +1.25	Above Average
4	23 – 27	-0.50 to +0.50	Average
5	20 – 22	-0.51 to -1.25	Below Average
6	16 – 19	-1.26 to -2.00	Low
7	15 and less	-2.01 and below	Very Low

The raw scores obtained from the ATS were converted into z-score by using z-score norms table provided in the ATS manual. According to table 4.1 (a), the levels of science achievement of the students were found out as depicted in Fig. 4.1. It was found that there were no students scoring ‘very high level’ as well as ‘high level’ in science achievement test. Of 298 students there was only one student (0.34 %) which falls under the level of ‘above average’. Further, 12 (4.03 %) students fall under ‘average’ level, 17 (5.70 %) students falls under ‘below average’ level, 80 (26.85 %) students fall under ‘low level’ and 188 (63.09 %) students fall under ‘very low level’, respectively. The present study is in-lined with the previous study conducted by NCERT and NEDFi (NAS, 2015; NEDFi, 2017).

Table 4.1 (b): Descriptive statistics of the scores of achievement in science

	N	Minimum	Maximum	Mean	Std. Deviation
Science Achievement score	298	4	28	14.36	4.05

Table 4.1 (b) showed the descriptive statistics from the scores of ATS for the students of higher secondary school of Aizawl. The mean value was found to be 14.36 which fell under the level of ‘very low’ in science achievement level. This mean value proved that the majority of students were under the category of ‘very low’ level in science achievement test.

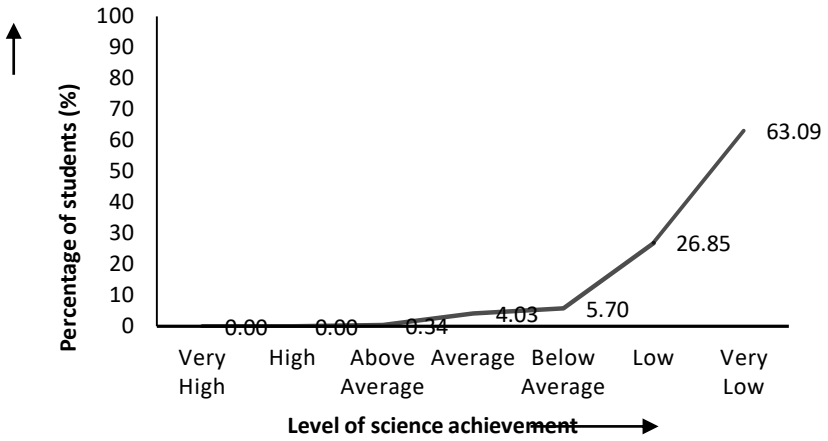

Figure 4.1: The percentage of different levels of science achievement

4.2 Comparison of Science Achievement Level between Female and Male students of Higher Secondary school of Aizawl

The numbers of female students along with percentage in each of the levels were listed as per table 4.1(a) in the result table 4.2 (a) shown below. It was found that there were no female students scoring beyond average level of science achievement test.

Table 4.2 (a): Number of female students for each levels of achievement in science

S/No.	Range of Raw Scores	Level of Achievement in Science	No. of Students	Percentage (%)
1	36 and more	Very High	0	0.00
2	32 – 35	High	0	0.00
3	28 – 31	Above Average	0	0.00
4	23 – 27	Average	4	2.68
5	20 – 22	Below Average	10	6.71
6	16 – 19	Low	42	28.19
7	15 and less	Very Low	93	62.42

Table 4.2 (b): Descriptive statistics of the scores of female students' achievement in science

	N	Minimum	Maximum	Mean	Std. Deviation
Science Achievement score	149	4	25	14.18	3.93

Table 4.2 (b) shows the descriptive statistics from the scores of ATS for female students of higher secondary school of Aizawl. The mean value was found to be 14.18, which fell under the level of 'very low' in science achievement level. This mean value proved that the majority of the female students were under the category of 'very low' level in science achievement test. Similarly, the numbers of male students' achievement as well as percentage for each of the levels were listed in the result table 4.2 (c) shown below. It was found that there is one male student which falls under the category of above average level.

Table 4.2 (c): Number of male students for each levels of achievement in science

S/No.	Range of Raw Scores	Level of Achievement in Science	No. of Students	Percentage (%)
1	36 and more	Very High	0	0.00
2	32 – 35	High	0	0.00
3	28 – 31	Above Average	1	0.67
4	23 – 27	Average	8	5.37
5	20 – 22	Below Average	7	4.70
6	16 – 19	Low	38	25.50
7	15 and less	Very Low	95	63.76

Table 4.2 (d): Descriptive statistics of the scores of male students' achievement in science

	N	Minimum	Maximum	Mean	Std. Deviation
Science Achievement score	149	4	28	14.54	4.16

Table 4.2 (d) shows the descriptive statistics from the scores of ATS for male students of higher secondary school of Aizawl. The mean value was found to be 14.54 which fell under the level of 'very low' in science achievement level. This mean value proved that the majority of the male students were under the category of 'very low' level in science achievement.

Comparison of science achievement level between female and male students were done by testing the null hypothesis by using 't'-test statistical analysis. Analysis of data vide table 4.2 (e) reflect the result for the test of significant differences between female and male students of higher secondary schools in their level of science achievement. The mean value of female and male student was found to be 14.18 and 14.54, respectively. The table also reveal the 't'-value for the significance of difference between the mean scores of female and male students towards science achievement level found to be 0.76 which is not significant at all. This finding implies that there was no significant difference in science achievement level of female and male students of higher secondary school students of Aizawl. Therefore, the hypothesis that there exists no significant difference between female and male student of XI standard in achievement in science is accepted.

Previous studies like Agbaja *et al.,* 2014 and Kaur *et al.,* 2015 support the present finding. However, the earlier studies across different parts of the world such as Darchhingpuii, 1988; Maccoby & Jacklin, 1974; Steinkamp & Maehr, 1983; Linn, 1991; Kotte, 1992; Lapointe *et al.* 1989; Postlethwaite & Wiley, 1992; Young & Fraser, 1993; Jovanovic *et al.,* 1994; Mullis *et al.*, 1988; Bateson & Parsons-Chatman, 1989; Beaton *et al.*, 1996; Acar *et al.* 2015 reported gender differences in science achievement.

Table 4.2 (e): Comparison of science achievement level between female and male students

Science Achievement	N	Mean	't'-value	Significant Level
Female	149	14.18	0.76	NS
Male	149	14.54		

4.3 Comparison of Science Achievement Level between Government and Private school students of Higher Secondary school of Aizawl

The numbers of Government school students in addition to percentage for each of the levels were listed in the result table 4.3 (a) shown below. It was found that there were no Government school students scoring very high level, high level, and above average of achievement in science.

Table 4.3 (a): Number of Government school students for each levels of Achievement in Science

S/No.	Range of Raw Scores	Level of Achievement in Science	No. of Students	Percentage (%)
1	36 and more	Very High	0	0.00
2	32 – 35	High	0	0.00
3	28 – 31	Above Average	0	0.00
4	23 – 27	Average	1	1.28
5	20 – 22	Below Average	5	6.41
6	16 – 19	Low	20	25.64
7	15 and less	Very Low	52	66.67

Similarly, the numbers of Private school students as well as percentage for each of the levels were listed in the result table 4.3 (b) shown below. Likewise, it was found that there were no students having very high level; high level; above average of achievement in science among Private higher secondary school students of Aizawl.

Table 4.3 (b): Number of Private school students for each levels of Achievement in Science

S/No.	Range of Raw Scores	Level of Achievement in Science	No. of Students	Percentage (%)
1	36 and more	Very High	0	0.00
2	32 – 35	High	0	0.00
3	28 – 31	Above Average	0	0.00
4	23 – 27	Average	2	1.18
5	20 – 22	Below Average	6	3.53
6	16 – 19	Low	38	22.35
7	15 and less	Very Low	124	72.94

Comparison of science achievement level of Government and Private school students were done by testing the null hypothesis by using 't'-test statistical analysis. Analysis of data vide table 4.3 (c) reflect the result for the test of significant differences between Government and Private school students of higher secondary schools in their level of science achievement. The mean value of Government and Private school student was found to be 14.10 and 13.27, respectively. The table also reveal the 't'-value for the significance of difference between the mean scores of Government and Private school students towards science achievement level found to be 1.70 which is not significant at all. This finding implies that there was no significant difference in science achievement level of Government and Private school students of higher secondary school students of Aizawl. Therefore, the hypothesis that there exists no significant difference between Government and Private school students of higher secondary school in achievement in Science is accepted.

Table 4.3 (c): Comparison of Science Achievement level of Government and Private Higher Secondary school students

Science Achievement	N	Mean	't'-value	Significant Level
Government	78	14.10	1.70	NS
Private	170	13.27		

4.4 Comparison of Science Achievement Level between Government and Deficit school students of Higher Secondary school of Aizawl

As per table 4.1 (a), the number of Government school students in each of level of achievement in Science were listed in the table 4.3 (a). Similarly, the numbers of Deficit school students as well as percentage for each of the levels were listed in the result table 4.4 (a) shown below. It was found that there was one student fall in the level of above average of achievement in Science among Deficit higher secondary school students of Aizawl.

Table 4.4 (a): Number of Deficit school students for each levels of achievement in Science

S/No.	Range of Raw Scores	Level of Achievement in Science	No. of Students	Percentage (%)
1	36 and more	Very High	0	0.00
2	32 – 35	High	0	0.00
3	28 – 31	Above Average	1	2.00
4	23 – 27	Average	9	18.00
5	20 – 22	Below Average	6	12.00
6	16 – 19	Low	22	44.00
7	15 and less	Very Low	12	24.00

Comparison of Science Achievement level of Government and Deficit school students were done by testing the null hypothesis by using 't'-test statistical analysis. Analysis of data vide table 4.4 (b) reflect the result for the test of significant differences between Government and Deficit school students of higher secondary schools in their level of science achievement. The mean value of Government and Deficit school student was found to be 14.10 and 18.46, respectively. The table also reveal the 't'-value for the significance of difference between the mean scores of Government and Deficit school students towards science achievement level found to be 6.78 which is significant at 0.01 level. This finding implies that there was a significant difference in science achievement level between Government and Deficit school students of Higher Secondary school students of Aizawl. Therefore, the hypothesis that there exists no significant difference between Government and Deficit school students of higher secondary school in achievement in Science is rejected. In 1988, Darchhingpuii reported from the study of science achievement among the secondary school students in Aizawl that there was no significant difference between students from government school and deficit school in science achievement.

Table 4.4 (b): Comparison of Science Achievement level of Government and Deficit Higher Secondary school students

Science Achievement	N	Mean	't'-value	Significant Level
Government	78	14.10	6.78	S at 0.01
Deficit	50	18.46		

4.5 Comparison of Science Achievement Level between Deficit and Private school students of Higher Secondary school of Aizawl

The numbers of Deficit school students as well as percentage for each of the levels were listed in the result table 4.4 (a) and the number of Private students as well as percentage for each of the levels were listed in the result table 4.3 (b), respectively. Similarly, comparison of science achievement level of Deficit and Private school students were done by testing the null hypothesis by using 't'-test statistical analysis.

Analysis of data vide table 4.5 (a) reflect the result for the test of significant differences between Deficit and Private school students of Higher Secondary schools in their level of science achievement. The mean value of Deficit and Private school student was found to be 18.46 and 13.27 respectively. The table also reveal the 't'-value for the significance of difference between the mean scores of Deficit and Private school students towards science achievement level found to be 8.83 which is significant at 0.01 level. This finding implies that there was a significant difference in science achievement level between Deficit and Private school students of higher secondary school students of Aizawl. Therefore, the hypothesis that there exists no significant difference between Deficit and Private school students of higher secondary school in achievement in Science is rejected.

Table 4.5(a): Comparison of Science Achievement level of Deficit and Private school students of Higher Secondary school

Science Achievement	N	Mean	't'-value	Significant Level
Deficit	50	18.46	8.83	S at 0.01
Private	78	13.27		

Table 4.5 (b): Descriptive Statistics of the scores of achievement in science between Government, Private and Deficit higher secondary school

	N	Minimum	Maximum	Mean	Std. Deviation
Government school	78	8	23	14.1	3.44
Private school	170	4	26	13.27	3.63
Deficit school	50	10	28	18.46	3.72

Table 4.5 (b) shows the descriptive statistics from the scores of ATS for the students in Government, Private and Deficit higher secondary school of Aizawl.

4.6 Relationship between Age and Science Achievement of Higher Secondary school students of Aizawl

The age distribution of higher secondary school students was shown in Fig. 4.6 (a). To find out the relationship between age of students and science achievement of higher secondary school students, the score of ATS and age of each student were analyzed by using Pearson-product moment correlation. Data analysis vibe 4.6 (a) shows the correlational test result. The correlation coefficient is -0.06. The value -0.06 is in close proximity to 0 which means that the test of correlation is not significant at all. There was no correlation between the age of each student and science achievement of higher secondary school students. Therefore, the age of students does not affect the achievement in Science at the present stage of higher secondary school students.

Table 4.6(a): Comparison between age of students and science achievement of higher secondary school students

	N	Minimum	Maximum	Mean	Correlation
Age of each students	298	15	20	17.47	-0.06
Science Achievement score	298	4	28	14.36	

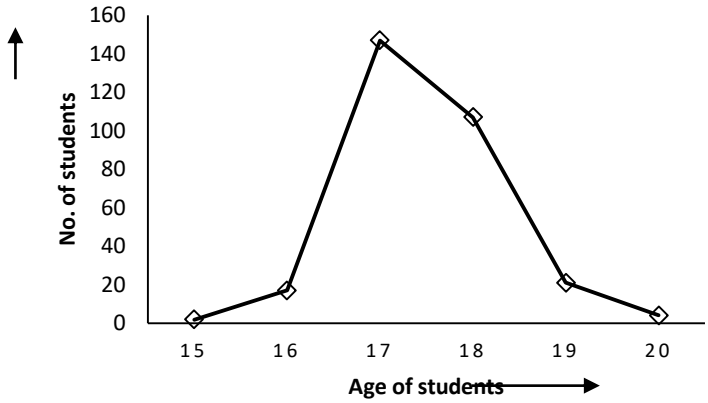

Figure 4.6 (a): Figure shows the graph between student age and number of students in the respective age

V. SUGGESTIONS AND CONCLUSION

Among 298 students, only one student fall under the level of 'above average'; 5.70 % students falls under 'below average' level; 26.85 % students fall under 'low level'; 63.09 % students fall under 'very low level', respectively. The majority of both the female and male students were under the category of 'very low' level in science achievement test. At the same time there was no significant difference in science achievement level between female and male students of higher secondary school students of Aizawl. Further, there was no significant difference in science achievement level between Government and Private school students of higher secondary school, Aizawl. However, there existed a significant difference between Government and Deficit school students as well as between Deficit and Private school students of higher secondary school. Students from deficit school outperformed both government and private schools.

The age of students does not have a correlation with the achievement in Science at the present stage of higher secondary school students. The author suggested that science teachers should use collaborative-learning activities and social modelling to promote students' interest, motivation, and achievement in science career. Learner-centered teaching-learning methodologies such as activity-based learning and laboratory experiments in Science should be employed to build students attitudes towards Science subject.

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