

# A Study on Motivation of High School Students towards Science Learning

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## ABSTRACT

*'Science is a masculine subject and it is best understood by men'. Social scientists have studied it, lawyers have tried to fix it and post-feminist society is over it. But women are still playing an under representative role by men in math, science and engineering fields. Keeping this in view, the current study is done to explore the motivation of grade IX and X students towards science learning. An essential element of science learning is motivation to learn. The objective of present study is to examine the extent of motivation towards learning science, and study the difference of motivation towards learning science on the basis of gender, location, class, parental qualification and caste. This research study was conducted as a descriptive survey based quantitative study. A 5-point rating scale is used which is a modified version of students' motivation towards science learning (SMTSL) questionnaire made by Tuan H. L. et al. It consists of 30 items arranged under five constructs a. Self-efficacy, b. Active learning strategies, c. Science learning value, d. Performance goal, e. Achievement goal. SMTSL was administered to 152 students, from 4 randomly selected schools in Purulia district. CR and F tests were used for analyzing the data and verifying the hypotheses. The study revealed that the high school students are averagely motivated towards science learning. The result exhibited that there is significant difference between the motivation of male and female, class IX and X, parents' educational qualification below and above 10<sup>th</sup> pass high school students towards science learning. It was also found that female students are more motivated than male high school students in science learning. There is no significant difference between the motivation of Rural and Urban students towards science learning. The study also exposed that caste has not played an important role in the motivation of students towards science learning.*

**Keywords:** Motivation, Science learning, Gender differences, Parental qualification.

## INTRODUCTION

Learning science is essential for each and every individual. Science enhances the logical thinking ability. Science fosters abstract thinking and it helps to increase one's problem-solving ability. Science is necessary for each and every development of life. But it has been observed that students find science to be a very challenging and tedious subject, especially girls. India is a nation which is progressing and developing, needs to create a science-oriented, substantial, liberal, well-informed, having a high capacity for change, revolutionary society and an innovative and a supplier to scientific and technological developments in the future. Women enrollments in science courses are very less from the time immemorial. Even though the results of most previous studies generally indicate that male students have higher motivation and achievement than girls or woman in learning science and math. (Meece and Jones, 1996) Learning science is quite important in life. Science education is an important tool in national Reforms for national development and it is a crucial element for Poverty Reduction. It is important for all students to become scientifically cultured and literate (Feinstein, 2011; Roberts, 2007). Hence, learning science by the students is an inevitable need in today's world. Participation of women in science and technology is necessary. From the time of birth, women have to undergo with many obstacles by the society from learning science and technology. Hence the number of women in science and engineering is growing (Cathrine, H., Corbet, C. & Rose, A. S.2010). At present a large proportion of girls at secondary school level enroll for science subjects, a very strong and persistent belief is there that females are by nature technologically ignorant and unable to absorb scientific information (Charity, K. M. & Kalagbor, I. A.). For this reason this paper wants to investigate that if there is any variances persist based on gender, in students' science learning motivation. Learning is a compound intellectual phenomenon where motivation works as a basic element. According to Jurisevic, M. et. al (2015) learning motivation as a construct which includes different motivational elements (interests, goals, attributes, self-image, external enticements, etc.). Motivation has been identified to have impacts on students' learning (Pintrich & Schunk, 2002). Motivation towards science learning may be defined as a desire for science learning (Bolat, 2007). Science learning motivation is termed as an aroused state that stimulates, guides, directs and sustains science-learning behaviour, motivation to learn science promotes student construction of their conceptual understanding of science (Cavas, 2011). Motivation of students towards science learning makes science learning operative and effective (Sarıbiyık, Altunçekiç &

Yaman, 2004). Motivation in science learning is very difficult to measure. However, this study approaches to measure motivation of science learning based on self-report and the self-perception about themselves.

### LITERATURE REVIEW:

Erb (1996) found out that students' lack of motivation were caused by students' lack of responsibility, students' low self-esteem, and students' family dysfunction. Other researchers found that different gender and grade level showed the different attitude toward science, the higher grade level of student showed better attitude toward science than lower grade level of student (Mattern, N. & Schau, C., 2002). Tuan, Chin, & Shieh (2005) also studied that students' motivation towards science learning was associated to their participation, although the teacher's presentation, and the abstractness and significance of science content interrelated to their daily lives. Llbaet. al. (2016) have studied on science learning motivation as correlate of students' Academic performances and found that the extent of their motivation did not vary across their sex, age, and curriculum year. Furthermore the respondents had good academic performances in science. Chan Y. L. & Norlizah C. H (2017) have done a study and found that female students are more motivated than male students in learning science. And parent's qualification does not play any significant role in science learning motivation, but they have found home environment of the learners plays an important role in students' science learning motivation. From the literature of Yamtinah, Masykuri, Ashadi, Shidiq (2017) it is found that male and female students have a similar attitude toward science process skill indicators. Male students have better results than female students. However, especially on the indicators of observation, controlling variable and making the conclusion. On the other hand, female students are better on conceptual knowledge and interpreting data. However, no study has been found in literature regarding motivation towards science learning of any level of students in West Bengal. That is why the researcher intends to assess the motivation towards science learning among high school students.

### OBJECTIVES OF THE STUDY:

1. To know the extent of motivation towards science learning among high school students.
2. To find out the difference between the motivation of Male and Female students towards Science learning.
3. To examine the difference between the motivation of Rural and Urban students towards Science learning.
4. To explore the difference between the motivation of Class-IX and X students towards Science learning.
5. To investigate the difference between the motivation of the high school students towards science learning with respect to their Mother's Qualification (Below 10<sup>th</sup> Pass & Above 10<sup>th</sup> Pass).
6. To investigate the difference between the motivation of the high school students towards science learning with respect to their Father's Qualification (Below 10<sup>th</sup> Pass & Above 10<sup>th</sup> Pass).
7. To evaluate the difference among the high school students motivation towards science learning with respect to their Caste (General, OBC, SC, ST).

### HYPOTHESES OF THE STUDY:

The null hypotheses for the present study are as follows:

- H<sub>01</sub>: There will be low level of Motivation among the High school students in Purulia district of West Bengal.  
 H<sub>02</sub>: There is no significant difference between the motivation of Male and Female students towards Science learning.  
 H<sub>03</sub>: There is no significant difference between the motivation of Rural and Urban students towards Science learning.  
 H<sub>04</sub>: There is no significant difference between the motivation of Class-IX and X students towards Science learning.  
 H<sub>05</sub>: There is no significant difference between the motivations of the high school students towards science learning with respect to their Mother's Qualification (Below 10<sup>th</sup> Pass & Above 10<sup>th</sup> Pass).  
 H<sub>06</sub>: There is no significant difference the motivation of the high school students towards science learning with respect to their Father's Qualification (Below 10<sup>th</sup> Pass & Above 10<sup>th</sup> Pass).  
 H<sub>07</sub>: There is no significant difference among the high school students motivation towards science learning with respect to their Caste (General, OBC, SC, ST).

### METHODOLOGY:

Descriptive Survey Method was conducted with the help of student's motivation towards science learning questionnaire to collect primary data and to verify the hypotheses. Participants were invited to give response to the scale and requested to fill the data in the schedule.



**Testing of  $H_{02}$ :**

From table 3 it was found that the mean score of motivation towards science learning of male and female students is 105.1 (S.D.= 10.02) and 110.34(S.D.=12.29) respectively. Moreover, t-value is found to be 2.71. Which is greater than the table value of  $df=150$ . The table value is 1.68 at 0.05 level and 2.61 at 0.01 level. Hence the result is found significant at 0.01 level. This clearly shows that  $H_{02}$  is rejected at 0.01 level. The result of the present study is similar with the other studies done by Zamrud (2008), Güvercin et al. (2010), and Cavas (2011) they also found that female students have high motivation towards learning science than male students. This finding connotes that there is a significant difference between male and female students internet use that helps to conclude that female students are highly motivated to learning science than male students. So the myth regarding science has started to change as female students are more eager to learn science than their male counterparts.

**Testing of  $H_{03}$ :**

Table 3 denotes that the mean score of motivation towards science learning of urban and rural students are 107.74(S.D.= 11.02) and 109.19(S.D.=12.56) respectively and the calculated value is 0.76 which is lower than the table value so the calculated value is not significant at 0.01 and 0.05 level of significance. Thus the hypothesis  $H_{03}$  is accepted at 0.01 level. It signifies that the motivation towards science learning is quite similar in rural and urban students, hence it can be concluded that region or locality does not play any role in the motivation towards learning science.

**Testing of  $H_{04}$ :**

Table 3 is evidence of the mean score of motivation towards science learning of Class X and Class IX students are 111.68(S.D.=13.24) and 106.96(S.D.= 10.77) respectively and the t-test result is 2.32 which is significant at 0.05 level of significance. Hence it can be easily concluded that  $H_{04}$  is rejected at 0.05 level. There is significant difference found between Class X and Class IX students' motivation towards science learning. From the above table it is seen that Class X students scored more than Class IX students so it can be said from the above analysis that the maturity of the learner effects on students' motivation towards science learning. This result corroborates with the studies of Greenfield, T.A.(1997), Britner, S. L.(2008) their research also support that the higher grade level of student presented improved motivation toward science than lower grade level of student.

**Testing of  $H_{05}$ :**

It is found in Table 3 that the mean score of motivation towards science learning students mothers' qualifications the mean of mothers' qualification below 10<sup>th</sup> pass is 105.57(S.D.= 10.59) and the mean of mothers' qualification of above 10<sup>th</sup> pass is 114.98(S.D.=11.98) respectively and the calculated value is 4.86 which is higher than the table value so the calculated value is significant at both level of significance. Thus the hypothesis  $H_{05}$  is rejected at 0.01 level. It signifies that the motivation towards science learning varies for student's mother's qualification. The mean of mothers' qualification above 10<sup>th</sup> is higher, hence it can be concluded that higher qualification of mothers' play a vital role in motivation towards science learning.

**Testing of  $H_{06}$ :**

Table 3 signifies that the mean score of motivation towards science learning student's father's qualifications the mean of fathers' qualification below 10<sup>th</sup> pass is 105.58(S.D.= 9.81) and the mean of fathers' qualification of above 10<sup>th</sup> pass is 111.66(S.D.=12.94) respectively and the calculated value is 3.28 which is higher than the table value so the calculated value is significant at both level of significance. Thus the hypothesis  $H_{06}$  is rejected at 0.01 level. It signifies that the motivation towards science learning varies for students' fathers' qualification. The mean of fathers' qualification above 10<sup>th</sup> is higher, hence it can be concluded that higher qualification of fathers' play a vital role in students' motivation towards science learning.

**Testing of  $H_{07}$ :****Table- 4: Showing Summary of ANOVA result**

Sources of (Variance)	Sum of Squares	df	Mean Square	F	Remark
Between Groups	530.350	3	176.783	1.288	Not significant at 0.01 and 0.05 level
Within Groups	20312.703	148	137.248		
Total	20843.053	151			

To know the difference in motivation towards science learning based on caste one way ANOVA is conducted and the calculated F value is 1.288 which is not significant at 0.01 and 0.05 levels both. So  $H_{07}$  is accepted and no difference found in motivation towards science learning of high school students based on the castes persist among the students i.e., General, OBC, SC, ST students.

**CONCLUSIONS:**

Some conclusions may be drawn from the above study. First, high school students are averagely motivated towards learning science. Secondly female groups have higher motivation towards science learning from their male counterparts. This study denied the myth which is science is a masculine subject. The result signifies that Females are also motivated to learn science consequently science can't be a masculine subject. Simpson and Oliver (1985) also determined that the female students have higher motivation in science learning than their male counterparts. The analysis also states that there is no variance in motivation towards science learning between the rural students and urban students. But class standard is a cause for a variance in motivation towards science learning. The result revealed that caste has not played a significant role in motivation towards science learning. However the higher qualification of parents gives a positive impact on student's motivation towards science learning. The possible reason behind this result may be the educated parents gives extra care and gives a good home environment, and those educated parents gives extrinsic motivation which forces the students' to enhance their motivation towards science learning.

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