

# EXPLORING GENDER DIFFERENCES IN STUDENTS' ATTITUDE TOWARDS SCIENCE AT ELEMENTARY SCHOOL LEVEL

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**Keywords:** Attitude, Science, Attitude towards science, and Elementary School

## ABSTRACT

The purpose of the present research was to explore the difference in attitude regarding science between female and male students at elementary school level in tehsil Kharian, district Gujranwala. It was comparative exploratory research based on cross-sectional survey design. The information was gleaned from 329 students of 8th class by using self-developed questionnaire who were selected randomly. Statistical Package for Social Sciences (SPSS) software was used to analyze the information by applying inferential statistics. The outcomes illustrate that female and male students of 8th class had low level of attitude towards science subject. Moreover, the outcome reveals no significant difference was found in the gender wise attitude regarding science. Even than locality and parental qualification wise no difference in students' attitude towards science was found. Parental occupation wise significant gender difference in students' attitude towards science was found. The parent who were former of laborer their gender had medium level of attitude towards science as compare to the other who belonged to business, governmental or semi-governmental occupation, their gender had low level of attitude towards science.

**Keywords:** Attitude, Science, Attitude towards science, and Elementary School.

## INTRODUCTION

Education has a great importance in our life. Man continues to acquire an education in one form or another from birth to death. It's never a final process of internal growth and development. It helps to develop skills in thinking, thinking, reasoning, problem solving and creativity, intelligence and attitude. According to Holy Quran:

“Read, 'O Prophet, ' in the Name of your Lord Who created. Created humans from a clinging clot. Read! And your Lord is the Most Generous. Who taught by the pen?”

Al-Quran 96:1-5.

In short, Islam is an excellent learner to learn and encourages all who do it to learn. Islam understands that any kind of knowledge, whether religious or scientific, is good for humanity. Only on the basis of education that people can become more developed and civilized.

In the school, the education of science education is very significant subject. Because of it play vital role in the life of students because of giving his/her critical thinking skills and seeking solution of the problems. Due knowledge of science, students learn such skill which help them in their whole coming life, and enable them to These are lifelong skills that enable students to make concepts regarding the existing objects, making intellectual

decisions, and come to know about policy development on the base of evidence. Through the schooling of technical knowledge, the attitudes play an important role to develop the knowledge and skills they need.

Observing students' attitudes toward science over the past 30 to 40 years is an important part of the scientific community's work. Its current importance is underscored by growing signs of declining youth interest in science careers. Collective with investigation that suggests scientific extensive in the population, and due to the cumulative acknowledgement and financial profits of knowledge of science and its social impotence, the declining facts that choose science as a knowledge are a substance of concern of sizeable social distress and discussion. As a result, the promotion of a positive attitude concerning science. Getting knowledge has always been remained a subject of science. (Collins, S. 2003)

To promote students' optimistic attitude toward science is one of the important goals of teaching science. The results of the recruitment measurement are as significant as the intellectual magnitudes. Inappropriately, cognitive domain becomes the focus by the teachers in utmost cases. The interest and attitude of students for educating is indeed the main to mastering concepts. Majority of the earlier researchers have shown the important association among attitudes toward performance of science and science, with students with positive attitudes achieving better learning outcomes. (Sihite, D. Y., 2017)

Over the past few eras have, researches had shown that attitude and interest of the boys and girls vary to the study of science as a subject and different perceptions of scientists and academic careers. In addition, students often report that they have different scientific and extracurricular science experiences. Such type of activities are very important since, though more women than men enroll in post-secondary institutions and obtain higher academic and technical degrees, many more men than women take the lead role in science or technology in engineering. (Rua, M. J., 2000)

Gender is always a status of separation between members of society. This is particularly evident in institutions like education. Researcher checks the attitude of male and female students and find out that are there any differences between both the gender's attitudes towards science.

### **Statement of the problem**

A Comparative study to explore Gender difference in students' Attitude towards Science at Elementary level in tehsil Kharian, district Gujrat.

### **Research Objectives**

Keeping in view the topic, the following objectives were formulated:

To explore level of attitude toward science in gender wise students at elementary school level regarding their group of:

- Locality
- Parental qualification
- Parental occupation

### **Research Questions**

Is there any gender wise difference in the level of attitude toward science in students at elementary school level regarding their group of?

- Locality
- Parental qualification
- Parental occupation

### **RESEARCH METHODOLOGY**

It was comparative exploratory research based on cross-sectional survey design.

## Population

The population of the present study was comprised 211 government elementary schools (Boys=87, Girls=124), and 4622 students (Girls=2654, Boys=1968) who were enrolled in 8<sup>th</sup> class in these elementary school which were situated in tehsil Kharian district Gujrat in the academic year of 2018-19.

## Sample and Sampling Technique

For the selection of sample from the population for the present study, the researcher used two stage random sampling technique. At the first stage for the selection schools from tehsil kharian, researcher randomly selected 40% (84) elementary schools (Boys=34, Girls=50). At the second stage from (84) selected schools, from urban and rural areas 50% of the elementary schools were chosen randomly. For the selection of students from each selected boy and girls elementary schools, due to uneven enrollment in every boys and girls elementary schools, by applying systematic random sampling technique, every 5<sup>th</sup> student of 8<sup>th</sup> class from each selected govt. elementary school was selected as a sample for present study. The total sample comprised 329 students (Girls=189, Boys=140)

## Research Tool

For the present study, the researcher used self-developed questionnaire for the collection of data from the respondent regarding their attitude towards science as a subject based on ABC model.

## Development of the Research Tool

Through literature review, the researcher came to know lots of components and model of attitude. So for the present research, the researcher followed ABC model of attitude e.g. affective, behaviour, and cognition components of attitude. Therefore, the questionnaire which researcher used for data collection has two sections. The first section of the questionnaire was contained demographic information regarding respondents e.g. school name, gender, parents' qualification, parents' occupation, and locality. The second section was has two parts. The first part contained statements regarding science subject to measure their attitude and the second part contained responses of the statement based on five points Likert scale e.g. There were 30 items in the questionnaire regarding attitude (10 for affective, 10 for behaviour, and 10 for cognitive).

## Pilot Testing of the Tool

After the development of research tool, the initial step is to check its validity and reliability. Therefore, it was validated by randomly selected 40 students of 8<sup>th</sup> class of four government elementary schools who were not included in the sample. Out of 40 students, 20 were female and 20 were male from one rural and one urban govt. elementary school. During the filling of questionnaire, the respondents faced some problems in understanding some statements and words which were used in questionnaire. The researcher facilitated them while filling questionnaire. After the collection of data, it was coded and entered into computer for analysis. Cronbach alpha was used to find out reliability of the questionnaire with the help of SPSS software and the computed reliability was .66. On the basis of responses some changes were made in the questionnaire. It was translated in Urdu and vague statements were rephrased and difficult words were omitted after making changes, it was again administered to 329 students (Girls=189, Boys=140). The reliability of the final administered questionnaire was calculated .92 which shows items in the questionnaire were highly correlated.

## Procedure of Data Collection

First of all, researcher personally visited CEO education office for collection of lists of government elementary schools which were situated in tehsil Kharian and seeking permission for collecting data in these schools. After seeking permission from CEO, the researcher personally visited elementary schools which were randomly selected for the sample of the present study. In school, the researchers met headmaster/headmistress and share the purpose of conducting research. A survey was conducted by the researcher himself to collect data from the respondents. The headmaster/headmistress of the school called their science teacher and introduced researcher and share the purpose of research with them. After that, science teacher of each school took researcher in the classroom and introduced researcher to 8<sup>th</sup> class students. The researcher distributed questionnaire among students and also briefed it regarding its filling. When all students filled it up, the researcher collected questionnaire and left school for the next. The researcher started data collection from 16<sup>th</sup> August till 30<sup>th</sup> October, 2019.

**Analysis of Data**

Once the data was collected, it was arranged. The arranged information was hinted and arrived into computer. Descriptive and inferential statistics was applied. To analyze the information, inferential and descriptive statistics was applied. Independent sample t-test was used to fined gender and locality wise variance in the level of attitude regarding science. ANOVA was applied to find out parental qualification and occupation wise variance in the level of students' attitude regarding science. Descriptive statistics was applied to compute frequency, mean, Standard Deviation etc.

**RESULTS**

**Level of Students' Attitude in the way of science regarding their group of Gender**

The following table discloses the computed t-values of gender wise students is (-.374) less than the table value (2.588) and computed sig value (.709) is greater than critical value (0.05). It points out that towards science, no variance was found in attitude of gender wise students. Therefore, concluded that male and female students of 8<sup>th</sup> class had the same level of attitude towards science subject. To know, if female and male students had similar level of attitude, what level of attitudes did they possessed, chi-square test applied in and the result is shown in the following contingency table No.1b.

Table No. 1a: Independent sample t-test to analyze gender wise difference in the level of attitude of students

| Demo Variables |        | N   | Mean | Std.D | t     | Sig. |
|----------------|--------|-----|------|-------|-------|------|
| Gender         | Female | 189 | 1.85 | .812  | -.374 | .709 |
|                | Male   | 140 | 1.89 | .814  |       |      |

df=327, sig=0.05

**Difference in the level wise attitude of students regarding their group of gender**

The following contingency table disclose that the computed  $\chi^2=0.145$  is less than (5.991) and computed sig value=0.930 which is greater than the critical value (P=0.05). It points out that towards science, no gender variance was found in attitude of students' whatever degree (low, medium, and high) of attitude did they possessed. Over all towards science, low level of attitude was found between male and female students.

Table No. 1b: Chi-square analysis to analyze level wise variance in the attitude of students regarding group of gender, (Girls=189, boys=140)

| Gender | %age                        | Level of Attitude |        |        | Total  |
|--------|-----------------------------|-------------------|--------|--------|--------|
|        |                             | Low               | Medium | High   |        |
| Male   | Sum                         | 55                | 46     | 39     | 140    |
|        | % inside Gender             | 39.3%             | 32.9%  | 27.9%  | 100.0% |
|        | % insidedegree of Attitude  | 41.4%             | 43.0%  | 43.8%  | 42.6%  |
|        | % of sum                    | 16.7%             | 14.0%  | 11.9%  | 42.6%  |
| Female | Sum                         | 78                | 61     | 50     | 189    |
|        | % inside Gender             | 41.3%             | 32.3%  | 26.5%  | 100.0% |
|        | % inside degree of Attitude | 58.6%             | 57.0%  | 56.2%  | 57.4%  |
|        | % of sum                    | 23.7%             | 18.5%  | 15.2%  | 57.4%  |
| Total  | Sum                         | 133               | 107    | 89     | 329    |
|        | % inside Gender             | 40.4%             | 32.5%  | 27.1%  | 100.0% |
|        | % inside degree of Attitude | 100.0%            | 100.0% | 100.0% | 100.0% |
|        | % of sum                    | 40.4%             | 32.5%  | 27.1%  | 100.0% |

$\chi^2= .145$ , sig=.930, df =2, The mean difference is significant at the .05S

**Difference in the level of attitude of Gender students in the way of science regarding their group of Locality**

The following table discloses the computed t-values of locality wise students is (-2.196) less than the table value (1.966) and computed sig value (.109) is greater than critical value (0.05). It points out that no locality wise difference in the attitude of gender students regarding science was found. Therefore, concluded that 8th class gender students of the rural or urban areas had the same level of attitude towards science subject. To know, if

gender students of both areas had same level of attitude, what degree/level of attitudes did they possessed, chi-square test applied in and the result is shown in the contingency table No.2b.

Table No. 2a: Independent sample t-test to analyze locality wise difference in the level of attitude of students

| Demo Variables | N     | Mean | Std.D | t    | Sig.   |      |
|----------------|-------|------|-------|------|--------|------|
| Locality       | Urban | 123  | 1.74  | .798 | -2.196 | .109 |
|                | Rural | 206  | 1.94  | .812 |        |      |

The following contingency table disclose that the computed  $\chi^2=5.013$  is less than (5.991) and computed sig value=0.082 which is greater than the critical value ( $P=0.05$ ). It points out that attitude of gender students in the way to science do not importantly differ regarding their group of locality whatever degree (low, medium, and high) of attitude they possessed. Over all male and female students of rural and urban areas had low level of attitude towards science.

Table No.2b: Chi-square analysis to analyze level wise difference in the attitude of students regarding group of localities, (Urban=123, Rural=206)

| Locality | %age                       | Level of Attitude |        |        | Total  |
|----------|----------------------------|-------------------|--------|--------|--------|
|          |                            | Low               | Medium | High   |        |
| Rural    | Count                      | 74                | 70     | 62     | 206    |
|          | % within Gender            | 35.9%             | 34.0%  | 30.1%  | 100.0% |
|          | % within Level of Attitude | 55.6%             | 65.4%  | 69.7%  | 62.6%  |
|          | % of Total                 | 22.5%             | 21.3%  | 18.8%  | 62.6%  |
| Urban    | Count                      | 59                | 37     | 27     | 123    |
|          | % within Gender            | 48.0%             | 30.1%  | 22.0%  | 100.0% |
|          | % within Level of Attitude | 44.4%             | 34.6%  | 30.3%  | 37.4%  |
|          | % of Total                 | 17.9%             | 11.2%  | 8.2%   | 37.4%  |
| Total    | Count                      | 133               | 107    | 89     | 329    |
|          | % within Gender            | 40.4%             | 32.5%  | 27.1%  | 100.0% |
|          | % within Level of Attitude | 100.0%            | 100.0% | 100.0% | 100.0% |
|          | % of Total                 | 40.4%             | 32.5%  | 27.1%  | 100.0% |

$\chi^2= 5.013$ , sig=.082, df =2 The mean difference is significant at the .05

#### Parental Qualification wise level of Attitude of students towards Science

The computed F-values of parental qualification wise gender students is (.339) less than the table value (2.12) and computed sig value (.916) is greater than critical value (0.05). It reveals that parental qualification wise towards science, no variance was found in attitude of gender students. To know, if male and female students whose parents had any level of qualification had same level of attitude, what degree/level of attitudes did they possessed, chi-square test applied in and the result is shown in the contingency table No.3b.

Table No.3a: Analysis of the Variance (ANOVA) to find the difference in the level of attitude of students towards science

| Qualification | SS      | df  | MS   | F    | sig  |
|---------------|---------|-----|------|------|------|
| Among Groups  | 1.358   | 6   | .226 | .339 | .916 |
| Inside Groups | 214.757 | 322 | .667 |      |      |
| Total         | 216.116 | 328 |      |      |      |

$P > 0.05$

The following contingency table disclose that the computed  $\chi^2=4.839$  is less than (18.307) and computed sig value=0.963 which is greater than the critical value ( $P=0.05$ ). It points out that no parental qualification wise variance between the attitude of gender students in the way to science whatever degree (low, medium, and high) of attitude did they possess. Over all male and female students whose parents had any level of qualification had low level of attitude towards science.

Table No.3b: Chi-square analysis to analyze level wise difference in the attitude of students regarding group of parents' qualifications,

| Qualification | %age                       | Level of Attitude |        |        | Total  |
|---------------|----------------------------|-------------------|--------|--------|--------|
|               |                            | Low               | Medium | High   |        |
| illiterate    | Count                      | 22                | 20     | 17     | 59     |
|               | % within father            | 37.3%             | 33.9%  | 28.8%  | 100.0% |
|               | % within Level of Attitude | 16.5%             | 18.7%  | 19.1%  | 17.9%  |
|               | % of Total                 | 6.7%              | 6.1%   | 5.2%   | 17.9%  |
| master        | Count                      | 2                 | 1      | 1      | 4      |
|               | % within father            | 50.0%             | 25.0%  | 25.0%  | 100.0% |
|               | % within Level of Attitude | 1.5%              | .9%    | 1.1%   | 1.2%   |
|               | % of Total                 | .6%               | .3%    | .3%    | 1.2%   |
| graduation    | Count                      | 4                 | 6      | 4      | 14     |
|               | % within father            | 28.6%             | 42.9%  | 28.6%  | 100.0% |
|               | % within Level of Attitude | 3.0%              | 5.6%   | 4.5%   | 4.3%   |
|               | % of Total                 | 1.2%              | 1.8%   | 1.2%   | 4.3%   |
| intermediate  | Count                      | 29                | 21     | 19     | 69     |
|               | % within father            | 42.0%             | 30.4%  | 27.5%  | 100.0% |
|               | % within Level of Attitude | 21.8%             | 19.6%  | 21.3%  | 21.0%  |
|               | % of Total                 | 8.8%              | 6.4%   | 5.8%   | 21.0%  |
| matric        | Count                      | 11                | 10     | 5      | 26     |
|               | % within father            | 42.3%             | 38.5%  | 19.2%  | 100.0% |
|               | % within Level of Attitude | 8.3%              | 9.3%   | 5.6%   | 7.9%   |
|               | % of Total                 | 3.3%              | 3.0%   | 1.5%   | 7.9%   |
| middle        | Count                      | 19                | 21     | 16     | 56     |
|               | % within father            | 33.9%             | 37.5%  | 28.6%  | 100.0% |
|               | % within Level of Attitude | 14.3%             | 19.6%  | 18.0%  | 17.0%  |
|               | % of Total                 | 5.8%              | 6.4%   | 4.9%   | 17.0%  |
| Primary       | Count                      | 46                | 28     | 27     | 101    |
|               | % within father            | 45.5%             | 27.7%  | 26.7%  | 100.0% |
|               | % within Level of Attitude | 34.6%             | 26.2%  | 30.3%  | 30.7%  |
|               | % of Total                 | 14.0%             | 8.5%   | 8.2%   | 30.7%  |
| Total         | Count                      | 133               | 107    | 89     | 329    |
|               | % within father            | 40.4%             | 32.5%  | 27.1%  | 100.0% |
|               | % within Level of Attitude | 100.0%            | 100.0% | 100.0% | 100.0% |
|               | % of Total                 | 40.4%             | 32.5%  | 27.1%  | 100.0% |

$\chi^2 = 4.839$ , sig=.963, df =12 The mean difference is significant at the .05

#### Parents' profession wise level of Attitude of students towards Science

The computed F-values of parental profession wise gender students is (.3.567) greater than the table value (2.63) and computed sig value (.041) is less than critical value (0.05). It reveals that parental profession wise there is gender difference in students' attitude towards science. To know, if male and female students whose parents were associated with any sort of job had different level of attitude, what degree/level of attitudes do they possessed, chi-square test applied in and the result is shown in the contingency table No.4b.

Table No.4a: Analysis of the Variance (ANOVA) to find out attitude's level' variance between gender students towards science regarding their group of parents' profession

| Qualification  | SS      | df  | MS   | F     | Sig  |
|----------------|---------|-----|------|-------|------|
| Between Groups | 1.125   | 3   | .375 | 3.567 | .041 |
| Within Groups  | 214.990 | 325 | .662 |       |      |
| Total          | 216.116 | 328 |      |       |      |

The following contingency table disclose that the computed  $\chi^2=18.015$  is greater than (12.596) table value and computed sig value=0.027 which is less than the critical value ( $P=0.05$ ). It points out that towards science; there is parental profession wise important variance in the level of attitude gender students. The parents who were laborer and former, their gender had medium level/degree of attitude towards science and the parent who were businessman, factory worker, or belonged to any other sort of occupation, their gender possessed low level/degree of attitude towards science.

Table No.4b: Chi-square analysis to find out level wise variance in the attitude of students regarding group of parents' professions,

| Profession  | %age                       | Level of Attitude |        |        | Total  |
|-------------|----------------------------|-------------------|--------|--------|--------|
|             |                            | Low               | Medium | High   |        |
| Businessman | Count                      | 68                | 50     | 42     | 160    |
|             | % within father            | 42.5%             | 31.3%  | 26.3%  | 100.0% |
|             | % within Level of Attitude | 51.1%             | 46.7%  | 47.2%  | 48.6%  |
|             | % of Total                 | 20.7%             | 15.2%  | 12.8%  | 48.6%  |
| Laborer     | Count                      | 4                 | 5      | 2      | 11     |
|             | % within father            | 36.4%             | 45.5%  | 18.2%  | 100.0% |
|             | % within Level of Attitude | 3.0%              | 4.7%   | 2.2%   | 3.3%   |
|             | % of Total                 | 1.2%              | 1.5%   | .6%    | 3.3%   |
| Worker      | Count                      | 32                | 22     | 19     | 73     |
|             | % within father            | 43.8%             | 30.1%  | 26.0%  | 100.0% |
|             | % within Level of Attitude | 24.1%             | 20.6%  | 21.3%  | 22.2%  |
|             | % of Total                 | 9.7%              | 6.7%   | 5.8%   | 22.2%  |
| Former      | Count                      | 29                | 30     | 26     | 85     |
|             | % within father            | 34.1%             | 35.3%  | 30.6%  | 100.0% |
|             | % within Level of Attitude | 21.8%             | 28.0%  | 29.2%  | 25.8%  |
|             | % of Total                 | 8.8%              | 9.1%   | 7.9%   | 25.8%  |
| Total       | Count                      | 133               | 107    | 89     | 329    |
|             | % within father            | 40.4%             | 32.5%  | 27.1%  | 100.0% |
|             | % within Level of Attitude | 100.0%            | 100.0% | 100.0% | 100.0% |
|             | % of Total                 | 40.4%             | 32.5%  | 27.1%  | 100.0% |

$\chi^2= 18.015$ , sig=.027, df =6 The mean difference is significant at the .05

## CONCLUSION AND DISCUSSION

The present study investigates male and female students' variance in attitude regarding science subject at elementary school level. The result shows that regarding science, overall no important variance was found in the level of attitude between female and male students. It might be said that attitude regarding science of male and female students was the same degree/level. The present study's results disclose that all male and female students had low level of attitude towards science. Sofiani D., et al (2017) in their research, although they found the optimistic attitude of the students in the way to science and it was medium level yet no significant gender difference in attitude was found. They also found same level of attitude between female and male towards science in their research. In the present research, the results also show locality wise no students' gender variation in the level of attitude regarding science was found. Gender students of rural and urban were enjoying same level of attitude towards science. Narmadha U., (2013) conducted a research and found important variation in the attitude regarding science by the locality wise students' gender. He found that gender students of urban area were enjoying higher level of attitude regarding science than rural area's gender students. Cukrowska A., (2014) found that

parental educational background also plays an important role to develop positive attitude in their kids towards science subject. The results of the present study disclosed that parental qualification had no effect on students' attitude towards science. The male and female students whose parent was enjoying any level of their qualification had same level of attitude towards science. Punch S., (2016) found his research that along with parental educational background; their occupation had vital effect on the attitude of students regarding science subject. The results of the present research showed the same results as they found. After analysis it was found important variation in the attitude between gender students regarding group of parental occupation about science subject. Gender of the parents he/she who were former and laborer had medium level of attitude towards science while the parents who were enjoying factory worker, govt. job, and running their own business e.g. their occupation, their gender had low level of attitude towards science subject at elementary school level. It was recommended that science teacher should develop attitude of students towards science by motivating them. Moreover while teaching science in the classroom teacher should be un-biased regarding gender students if there is combine classes at elementary school level. Both teachers and parents should focus on their child's attitude towards any subject and motivate his/him if they lacking their interest about it. It is found that at elementary school level colorful books also attract students. Therefore, curriculum department should print such colorful data in science book which attract students so that they start taking interest in it. Learning material should be selected on the basis of knowledge, skills and attitude of the learners. Teacher should use different strategies to encourage the students in learning science more effectively by doing experimental work. Government should conduct conferences and seminars to talk about this issue with experts and plan the strategies for positive personality development of students.

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