



Science Related Attitude of Secondary School Teachers: A Cross Sectional Analysis of Secondary Schools of District Mardan

Hira^{a*}, Dr. Abdul Ghaffar^b, Dr. Muhammad Idris^c

^aM. Phil Scholar, Department of Education, Abdul Wali Khan University Mardan. ^bAssociate Professor, Department of Education, Abdul Wali Khan University Mardan. ^cAssociate Professor, Department of Education, Abdul Wali Khan University Mardan

^{*}Email: naintara443@gmail.com

Abstract: This study is about the comparison of science related attitude of secondary school teachers. Objectives of the study were to investigate science related attitude of science teacher based on their gender. To find effect of science related attitude of teacher on students learning. All the (1470) government and private male/female secondary school teachers in Tehsil Mardan were the population in this research study (EMIS). (1503) teachers in public and private secondary schools were used as the research work's sample. 'Randomly' chosen samples were used (Krejcie and Morgan, 1970). closed-ended questionnaire' was used. Every step of the research protocol was followed. Information was gathered for the sample's mention. The t test and the ANNOVA test were used in SPSS to tabulate and evaluate the collected data. It was found that that there is no dissimilarity among male and female attitude towards science. Male and female have same interest in science. The findings indicate that private school teachers have more favorable attitude towards science as compare to government school. The male teachers have same professional attitude of both government and private school but there is a momentous alteration in the attitude of female instructors of government and private schools. Private school female teachers have more professional attitude then government school.

Keywords: Science related attitude, Students' skills, Teaching methods, Personal and professional attitude

1. Background of the Study

Outside of the classroom, teachers now have additional tasks and obligations. The key activities that maintain teachers at the forefront are the dissemination of awareness, the transaction of curricula, and the execution of educational policies. The times have brought a new dimension to this career, one that calls for certain competencies and the appropriate mindset. The student's personality is shaped in part by the teacher's actions, attitudes, and interests. Education is generally used to refer to three things: knowledge, subject, and process. Today every aspect of life has been influenced by science, Science helping us to make our life easier. Instructing of ordinary science for everyone has turned into an unavoidable piece of general schooling. It is the part of schools curriculum just like other subject but science contain some more value than the other subject because it has certain factors.

Science has shrunk the planet and fundamentally altered how we view ourselves. The current state of science affects every aspect of human activity, in fact. However, modern science is not just limited to interests, consistency, and ability to understand and appreciate science. The world of science has recently experienced a rapid proliferation of knowledge. Science is now more important than ever, thanks to incredible advances in technology, invention, and the application of these logical breakthroughs to improve human wealth in the areas of business, correspondence, transportation, design, agriculture, and medicine.

Educating of ordinary science for everyone has turned into an undeniable piece of general training. Nobody questions if it included in the curricula at the schools. It is included in a few exceptional qualities curious to it and which no other subject can give next to fulfilling the normal requirements for its consideration as a subject in the educational plan like Science education helps students develop logical thinking skills as well as cultural, moral, aesthetic, practical, and professional traits. It also helps students develop a logical mindset and logical fitness. Hence Science is now a required topic in every type of school curriculum, even at the most basic levels. The major outcome of scientific educators is a logical temperament. Its very well might be implanted in students by teachers because nobody else is capable of rousing them for the mechanical world. Several students develop their capacity for understanding logical concepts mostly due to their dedication. The scientific mindset is characterized by an unbiased and objective approach and the use of empirical methods in the search for Comprehension (Nugent, 2013). A method of conducting research that is accurate, intellectually honest, open-minded, suspends judgment, critical, and has the habit of seeking for real cause and effect links Typically, scientific attitudes are linked to scientists' thought processes.

1.1 Objectives of the Study

1. To investigate 'science related attitude of science teacher'
2. To compare science related attitude Gender wise male\female

1.2 Research Questions

1. What is the level of science related attitude of science teacher?
2. Does difference exist between male and female attitudes towards science?

2. Review of the Related Literature

2.1 Attitude

Attitude can be described as a person's mindset or way of thinking, feeling, and behaving towards a particular situation, person, or thing. It's like a mental and emotional stance that influences how we approach and respond to the world around us. Attitude can be positive, negative, or neutral, and it plays a significant role in shaping our actions and interactions with others.

An individual's thoughts, beliefs, approaches, and activities toward a definite subject, person, element, organization, or occasion are referred to as their attitude (Cherry, 2019). There is a propensity to evaluate stuffs based on individual personal opinions, approaches, or observations. As an outcome, individual might feel or reflect positively or negatively about a specific issue, thing, person, organization, group, occasion, etc. An individual's predisposition to respond positively or negatively to a particular topic, item, organization, or event (Ajzen, 1993). Where does one acquire or learn such attitudes, is the query. An individual's attitude is shaped by their upbringing and culture, which in turn affects how they behave toward different people, things, subjects, institutions, events, etc. Ajzen (1993) asserts that exposure to many stimuli, including viewing television, shapes an individual's mindset. One becomes oriented to form an opinion on anything by watching television. However, Abun (2018) delves further into the idea that culture shapes an individual's perspective. He argues that an individual's upbringing shapes their mindset. His view is supported by Donald (2002) and Hofstede, which Brown (1995) mentioned. Donald made the case that culture has a significant impact on how our brains work and even how they are structured. This perspective is consistent with Hofstede's argument in Brown (1995) that culture is the collective

mental training that allows one human group to be distinguished from another. This view was further reinforced by Armstrong's (1996) assertion that cultural factors have a significant impact on how people perceive ethics. In this instance, a person's ethical assessment is influenced by their upbringing. As stated by Hilgard (1980), Rosenberg & Hovland (1960), Allport (1954) and Ajzen, (1993) that there are three groups of responses or reactions toward the article of the approach and they are cognitive, affective and behavioral responses. The person's opinions, insights, or concepts concerning the theme of the attitude are denoted to as the cognitive component of the attitude. The emotional response or sensation that an individual has toward the theme of their attitude, such as like or disliking, is identified as the affective component. Although an attitude's behavioral or cognitive component is connected to how the attitude's object is acted upon. One must decide what to do or not do after learning that the subject, item, institution, or event will cause an emotional and behavioral response in them. Plans, purposes, and obligations to an intentional comportment are a few examples of these.

2.2 Science Related Attitude

According to Osborne et al. (2003), attitudes toward science include people's favorable or negative views on science depending on how they see it—as a subject taught in schools, as a part of society, or as a human activity. It is now generally agreed upon that a broad, persistent favorable or negative attitude toward science should be referred to as one's attitude toward it. When it comes to the wide range of beliefs, values, and perspectives people have about science as well as their desire in pursuing possible jobs in the field, Attitude is additional temperamental concept that variations more gradually. Osborne et al. (2003) state that attitudes regarding science in schools can be significant results in and of themselves, independent of how they are taught. Relationships between student achievement and increases in topic knowledge and attitudes toward science can also be statistically important. According to (Bybee & McCrae, 2011; Newell, Zientek, Tharp, Vogt, & Moreno, 2015) attitudes can have a direct or indirect impact on students' motivation, engagement, and persistence in their academic study of science.

2.3 Teacher's Attitude Towards Science

One of the main factors influencing pupils' attitudes toward science is their awareness of professors' attitudes about the subject, one of the obstacles to teaching primary science effectively is a lack of enthusiasm for the subject. According to Stollberg (1969), educators who have a neutral or negative attitude toward science education may choose not to teach it or may inadvertently transmit this attitude to their younger pupils. As such, the correlation between attitude and behavior needs to be viewed as a school of education that trains future educators (Tosun, 2000). Many educators claim that their main objection to teaching science is because they have insufficient knowledge of the subject and its methodologies. However, educators should find science less stressful and put in greater effort to teach it well if they have high self-efficacy beliefs about their capacity to do so. Using a Turkish version of the Science education Attitudes Scale (STAS II), created by Moore and Foy (1997), Türkmen and Bonnstetter (1999) investigated the attitudes of Turkish pre-service science teachers toward science and science education 612 scientific education majors in their first, second, junior, and senior years from four distinct teacher colleges spread throughout several regions of Turkey made up the study's sample. According to the study's findings, Turkish science instructors preparing for the profession have favorable opinions about science and science instruction.

3. Research Approach

Quantitative approach was used for this study. Descriptive method was use for data gathering. In order to summarize and describe the data that was obtained the descriptive approach was utilized. An in-depth comprehension of the elements under investigation was made possible by the application of descriptive statistics. Examples include comparing the attitudes of men and women toward science and how those attitudes affect students' learning. The survey instruments which acquired the procedure of a questionnaire was carefully produced to gather data concerning comparison of science related attitude of secondary school teachers in the basis of sector and gender. The questionnaire was composed of multiple choice questions covering the topic's variables.

3.1 Population

All government and primary, public and private secondary school teachers in Tehsil Mardan were formulating population of the study

Table 1: List of schools

Sector	Male	Female
Government	15,066	7,539
Private	20,429	24,233
No of institutes	918	552

3.2 Sample

Random sampling technique was used to collect quantitative data Raosoft calculator was used for choosing the sample size for this study (Krejcie & Morgan, 1970).

Table 2: Sample Selection

Sector	Male	Female
Government	380	366
Private	378	379
No of institutes	272	227

3.3 Data Collection Tool

The descriptive method was used to provide a summary. As it used to enable the collection of data that was both relevant and accurate, a questionnaire functions as a key instrument for data collection in this study. The purpose of the questionnaire was to carefully gather data from the population that would be the subject of the study. The data that was gathered was carefully scrutinized to ensure its accuracy, and it was analyzed and described.

4. Data Analysis

Using a Likert scale, the gathered records were analyzed using the statistical software for social sciences (SPSS). Following data analysis, a conclusion was reached. An analysis of correlation was performed. The degree to which certain variables are linearly related. Conclusion is drawn and recommendations were generated properly. Descriptive statistics were used to summarize and characterize the most significant features of the collected data. A summary of the distribution and central tendency of the variables was provided by the calculation of measures such as mean, standard deviation, frequencies, and percentage. These variables include science related attitude in different sectors and genders. In order to investigate the connection between the sciences related attitude of science teacher's male/female working in public/private schools was calculated with the support of the Pearson correlation coefficient, and its direction was established using the same tool. To have a better understanding of the statistical significance of the association that was found. The significance of correlation was analyzed.

4.1 Gender Related Attitudes Towards Science

In general, attitudes towards science are positive, as seen by the gender-specific mean score of 1.49. When it came to their lack of enthusiasm and motivation to study science, women scored higher on mean (2.74), std deviation (.721) than men. When it came to science, women likewise seemed more nervous than men (mean = 2.77, std dev = .721).

4.2 Government and Private School Comparison

Regarding attitudes towards science, the mean score for government and private schools is 1.47, indicating a generally positive attitude. Teachers in private schools (mean = 2.62), std deviation (1.192) are marginally more positive about science than teachers at public schools.

4.3 Teacher's Influence on Students' Attitude Towards Science

In general, student learning benefits from teachers' cooperation and motivation (mean = 1.71). Students are encouraged to embrace a scientific attitude by open-minded teachers (mean = 1.84) and a welcoming learning environment (mean = 1.77). Science is viewed favorably by teachers in both urban and rural settings (mean = 2.59). The opinions of teachers can be good or negative depending on the location (mean = 2.55). An independent sample *t test* was conducted to determine whether male teachers are considering science as the most fascinating discipline than female teachers. A group of 1503 teachers were divided into two groups of male and female teachers, male group having 758 teachers while female group was comprised of 745 teachers. The groups did not differ significantly, $t(99)=0.050$, $p=.960$, 95% CI [-.282, .296]. The mean for the male ($M=1.64$, $SD=.898$) was not significantly different than the female ($M=1.63$, $SD=.487$). These findings do not support the idea that the males are considering science as the most fascinating discipline than female.

An independent sample *t test* was conducted to determine whether studying science makes students uneasy. A group of 1503 teachers were divided into two groups of male and female teachers, male group having 758 teachers while female group was comprised of 745 teachers. The group did not differ significantly, $t(99)=-2.986$, $p=.204$, 95% CI [-.231-.232]. The mean for male ($M=2.74$, $SD=1.226$) was not significantly different than the female ($M=3.43$, $SD=1.061$) these findings do not support the idea that studying science make students feel uneasy.

An independent sample *t test* was conducted to determine whether female are less enthusiastic and motivated to pursue science. A group of 1503 teachers were divided into two groups of male and female teachers, male group having 758 teachers while female group was comprised of 745 teachers. The group did not differ significantly, $t(1503)=-6.573$, $p=.000$, 95% CI [-1.677,-.899]. The mean for the male ($M=2.10$, $SD=.953$) was not significantly different than the mean of female ($M=3.39$, $SD=.998$) these findings do support the idea that female are less enthusiastic motivated to pursue science.

An independent sample *t test* was conducted to determine whether female have more anxiety about science. A group of 1503 teachers were divided into two groups of male and female teachers, male group having 758 teachers while female group was comprised of 745 teachers. The group did not differ significantly, $t(1503)=-5.035$, $p=-1.028$, 95% CI [-1.430,-.621]. The mean for the male ($M=2.26$, $SD=.944$) was significantly different than the mean of female. ($M=1.080$, $SD=.154$) these findings do support the idea that female have more anxiety about science.

An independent sample *t test* was conducted to determine whether Private schools teachers have more favorable attitude towards science as compare to government school teachers. A group of 1503 teachers were divided into two groups of government school teachers and private school teachers, government teachers group having 746 teachers while private teachers group was comprised of 757 teachers. The group did not differ significantly, $t(1503)=3.467$, $p=0.001$, 95% CI [0.363, 1.335]. The mean for the government teachers ($M=3.20$, $SD=1.229$) was not significantly different than mean of private teachers ($M=2.17$, $SD=1.204$) these findings do support the idea that Private schools teachers have more favorable attitude towards science as compare to government school teachers.

An independent sample *t test* was conducted to determine whether there is no difference in the professional attitude of male teachers of both government and private schools. A group of 1503 teachers were divided into two groups of government school teachers and private school teachers, government teachers group having 746 teachers while private teachers group was comprised of 757 teachers. The group did not differ significantly, $t(1503)=3.383$, $p=0.001$, 95% CI [0.304, 1.167]. The mean for the government teachers ($M=2.88$, $SD=1.166$) was not significantly different than mean of private teachers ($M=2.15$, $SD=0.978$) these findings do support the idea that there is no difference in the professional attitude of male teachers of both government and private schools.

4.4 Findings

Findings of the study included of the following.

One of the most fascinating discipline is science and the results revealed the mean difference of male and female in public and private school the mean for male is $M=1.64$, $SD=0.898$, the mean for female $M=1.63$, $SD=0.87$ the mean for government school $M=1.54$, $SD=0.54$, the mean for private school $M=1.74$, $SD=0.871$ and the results do not support the idea. The word science even the thought of studying science makes me uneasy and the results revealed the mean difference of male and female as well as public and private schools. The mean for male is $M=2.74$, $SD=1.226$, the mean for female is $M=3.43$, $SD=1.061$ the mean for government school $M=3.23$, $SD=1.215$ the mean for private school $=2.91$, $SD=1.158$ and the results do not support the idea. Teachers motivation and cooperation

have positive effect on students learning. The results revealed the mean differences of male and female as well as public and private schools. The mean of male is $M=1.66$, $SD=0.745$, the mean of female $=M=1.76$, $SD=0.522$. The mean of government school is $M=1.69$, $SD=0.643$, mean of private school is $M=1.72$, $SD=0.649$ results do support the idea. Female are less enthusiastic and motivated to pursue science. The results shows the mean difference of male, female and public and private schools the mean of male is $M=2.10$, $SD=0.953$. The mean of female is $M=3.39$, $SD=0.996$. The mean of government school $M=3.04$, $SD=1.188$. Mean of private school $M=2.40$, $SD=1.056$ the results do support the idea. Female have more anxiety about science the results indicate the mean differences of male, female and public, private school the mean for male $M=2.26$, $SD=0.944$, mean for female $M=3.29$, $SD=1.080$. The mean for government school $M=3.04$, $SD=1.188$, mean for private school $M=2.40$, $SD=1.056$ the results support the idea. Private schools teachers have more favorable attitude towards science as compare to government school teachers. The results indicate the mean of male/female and public/private schools. The mean of male $M=2.14$, $SD=1.212$, the mean of female $M=3.10$, $SD=1.177$, the mean of public school $M=3.02$, $SD=1.229$, the mean of private school $M=2.17$, $SD=1.204$ the results do support the idea. There is no difference in the professional attitude of male teachers of both government and private schools. The results revealed the mean of male/female and public/private schools. The mean of male $M=2.14$, $SD=1.010$, the mean of female $M=2.94$, $SD=1.126$ and the mean of government school $M=2.88$, $SD=1.166$, mean of private school $M=2.15$, $SD=0.978$ the results support the idea.

5. Conclusion

Within the framework of secondary education in Tehsil Mardan. The findings of the study highlight the interaction between male and female teachers in public and private sectors science related attitude and its effect on students motivation and encouragement and the level of science related attitude of teachers wither positive or negative. According to the finding of the study the subject science is not fascinating for students but teachers motivation and cooperation has positive effect on students learning. Open-minded teachers and those who create friendly environment doesn't encourage students to adopt scientific mindset. The research shows us that there is still a gender gap in male and female attitude towards science female have more anxiety about science then men. Female are less enthusiastic and motivated to support science. The findings of the study indicates that there is no difference between male and female attitude towards science. Male and female have same interest in science. According to the findings private school teachers have more favorable attitude towards science as compare to government school. The male teachers have same professional attitude of both government and private school but there is a significant difference in the attitude of female teachers of government and private schools. Private school female teachers have more professional attitude then government school. Teachers in urban and rural areas have same positive attitude towards science. But various places have various teachers attitude towards science either positive or negative. Teacher did not play any role in influencing student's attitude toward science they have no impact on how students feel about science. According to the results science related attitude of teachers have a good effect on students learning a positive teaching attitude has a favorable impact on students and the institution. The results revealed the mean of sector and gender. To develop science related attitude among students the scientific mindset of teachers is not necessary. Positive teaching attitude doesn't have favorable impact on students and institute.

5.1 Implication and Recommendation

The findings of this study have several implications for future research and practices in educational development based on the outcome that was shown in the preceding section. The implication and suggestion that follow are underlined:

For development of science and for student's motivation to pursue science career the teacher and the institute may make science more fascinating subject. The government may more facilitate public school and teachers to make them more professional and have more positive attitude towards teaching. The government may motivate teachers by appreciating their work to encourage them to do better work which may help in student's improvement.

References

- Bandyopadhyay, J. (1984). Environmental influence academic achievement and scientific aptitude as determinants of adolescents attitude towards Science stream.
- Saxena, A.K. (1985), Attitude towards Physics a Cognitive Preference Styles among Different Groups of Science Students, University of Rajasthan, Department of Education, (Doctoral dissertation).
- Shinde Y.K. (1982), A Study of Non-Formal Science Activities in Secondary Schools of Maharashtra State with Special Reference to their Impact on Scientific Attitude and Achievement in Science, Bombay University, Department of Education, (Doctoral dissertation).
- Ghosh, S. (1986), A Critical Study of Scientific Attitude and Aptitude of the Students and Determination of some Determinants of Scientific Aptitude, Kalyani University, Department of Education (Doctoral dissertation)
- Saheb and Sathiyagirirajan (1979), A Study of Scientific Attitude of College Teachers, Journal of Higher Education.
- Shaughnessy, J., Shaughnessy, J. M., & Haladyna, T. M. (1983). Relations of student, teacher, and learning environment variables to attitude toward mathematics. *School Science and Mathematics*, 83(1), 21-38.
- Kumar, Udaya (1991), A Study on the Teaching of General Science and the Development of Scientific Attitude in Secondary School Students in relation to Achievement in General Science, M.S. University Baroda, Department of Education (Doctoral dissertation).
- Renu Bala (2004) A Comparative Study on Attitude of Science Teachers towards Science and its Effect on Students Achievements in Science, Kurukshetra University, Kurukshetra, Department of Education, (M.Ed. dissertation)
- Srivastava, N.N. (1983), A Study of Scientific Attitude of Science and Arts Students Belonging to Scheduled Caste, and Scheduled Tribes vis-à-vis Non-Scheduled Caste Communities, University of Rajasthan, Department of Education, (Doctoral dissertation).
- Tricia, Young (2007), Attitude towards Science, New York: Ellis Harwood Baker, D. (1992). Letting Students Speak: Triangulation of Qualitative and Quantitative Assessments of Attitude Toward Science.
- Van Aalderen-Smeets, S. I., Walma van der Molen, J. H., & Asma, L. J. (2012). Primary teachers' attitudes toward science: A new theoretical framework. *Science education*, 96(1), 158-182.
- Sarikaya, H. (2004). Preservice elementary teachers' science knowledge, attitude toward science teaching and their efficacy beliefs regarding science teaching (Master's thesis, Middle East Technical Univer Novick, S., & Duvdvani, D. (1976). The Scientific Attitudes of Tenth-Grade Students in Israel, as Measured by the Scientific Attitude Inventory. *School Science and Mathematics*, 76(1), 9-14. sity).
- Sönmez, S. E. M. A. (2007). Preschool teachers' attitudes toward science and science teaching (Master's thesis, Middle East Technical University).