



ROLE OF SCIENCE TEACHERS IN DEVELOPING SCIENTIFIC ATTITUDES AMONG SECONDARY SCHOOL STUDENTS IN VISAKHAPATNAM DISTRICT

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Abstract

The purpose of the current study is to determine how science teachers in the Visakhapatnam district contribute to students' development of scientific viewpoints. This study employed a thorough survey strategy, using a stratified random sampling technique. The sample included 200 instructors from secondary schools in the Visakhapatnam district. The questionnaire was created for instructors to get their opinions on how science teachers might encourage secondary school pupils to have a scientific attitude. The SPSS application was used to evaluate the data using various statistical techniques, including mean, standard deviation, t-test, and F-test (ANOVA). The results of the various groups were compared with factors including gender, age educational background, of the teachers. The findings showed that secondary school pupils were more aware of how science professors might encourage scientific ideas. The findings are addressed in the context of previously examined research, along with implications and suggestions for additional study.

Key words: science teachers, Visakhapatnam, secondary schools, questionnaire, gender, age educational background,

Introduction:

One of the hobbies humans have invented science, and the primary motivation behind the scientific investigation is bland curiosity. The prosecution of the Science Indian Education Commission has shifted its emphasis to "truth-seeking," highlighting the significance of science education in the secondary school curriculum. The demand for scientists and technicians to teach science-based subjects in schools has expanded due to the rapid growth of science and technology. Every secondary school student should read General Science as required, as suggested by the Secondary Education Commission (1952–1953). The large-scale growth of science and its application to suit the nation's requirements are described as "the prominent feature of the present world" in the Government of India's Resolution on Scientific Policy from 1958. The intellectual growth of a person is the main objective of education. Due to its numerous benefits to the individual and society, science is now a required topic in schools.

A scientific attitude is a concoction of several mental functions or propensities that consistently react in predetermined ways to novel or challenging circumstances. These include precision, intellectual honesty, open-mindedness, deference to the veracity of the facts, scepticism, the ability to suspend judgement, critical thinking, persistence, and the ability to discern the actual cause-and-effect link. Scientists become permanent practitioners as a result of their hunger for knowledge. They are innately curious and are always looking to learn new things. My scientific mentality is strengthened through this internship. It is crucial to instil a scientific mindset in our pupils in this rapidly advancing science and technology era. Teachers can encourage their pupils to explore the world of technology. Many students gain a steadfast interest in science—persistence, and an understanding of the nature of science, mainly due to their dedication. Teachers must have a good attitude toward science since they have a great duty to influence the country's future. A positive attitude fosters the most prevalent scientific perspective in their students. The teacher is the primary resource in helping students today achieve their objectives and aspirations, and the instructors' attitudes directly influence students' attitudes.

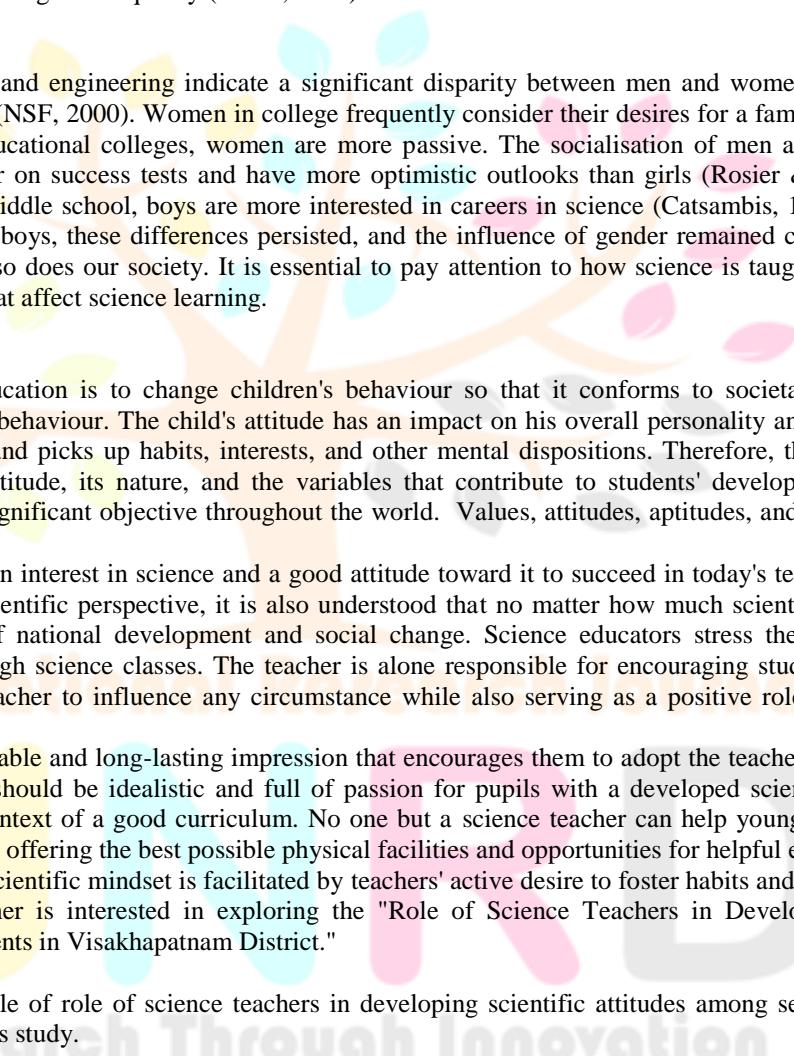
To encourage a positive attitude in their students, science teachers should model it for them. The world is evolving technologically and scientifically in every way, and people who have a scientific perspective can live successfully. In the same way, non-science professors have the same responsibility to modify students' perspectives to make them more scientific during

this life-altering event. Here, every science and non-science teacher should encourage pupils to acquire a passion for science and a scientific outlook for the nation's future, ensuring that our nation is included among the developed nations.

Scientific Attitude:

Although most of the population lacks science literacy, many people understand the value of science (Crocker, 1997). Promoting a positive attitude toward science among students is one of the objectives of science standards (NREL, 2002); this is particularly important in the biotechnology and information technology eras of the 21st century. Whether a person likes science or not, their attitudes generally reveal how they feel about it (Coballa & Crawley 1985). According to Munby (1983), the scientific perspective is a typical method of thinking that scientists frequently employ, such as objectivity, inquiry, questioning, and justification of findings based on data. According to Jint (2002), attitudes may be taught and learned.

Success in science is closely correlated with attitudes toward science (George, 2000). Between 0.16 and 0.70, there was a significant link between students' attitudes toward science and their academic success (Willson, 1983; Steinkamp & Maehr; 1983; Weinburgh, 1995; Marsh, 1992). According to Bloom's Educational Theory (1976), attitudes can impact student success scores of up to 25%. With a difference of over 10% in accomplishment scores, Oliver and Simpson (1988) discovered that motivation and self-perception were significant predictors of achieving Science Achievement. A 10–40% variation in prior performance perception achievement scores was also shown by Rennie and Punch (1991). This research has demonstrated that the connection between students' attitudes and academic success is causal rather than merely linked. If true, teaching students about causation could be a helpful method for ensuring that they learn (Modern, 2002). Science education has a lot to say about gender issues. The Science Teaching Standards must consider gender equality (NSES, 1996).



The primary goals in science and engineering indicate a significant disparity between men and women in the Higher Education Research Institute at UCLA (NSF, 2000). Women in college frequently consider their desires for a family and children (NECUSE, 1996). In the labs of coeducational colleges, women are more passive. The socialisation of men and women may differ in this regard. Boys score higher on success tests and have more optimistic outlooks than girls (Rosier & Banks, 1990; Shibesi, 1986). Compared to girls in middle school, boys are more interested in careers in science (Catsambis, 1995). Although females fared as well as or better than boys, these differences persisted, and the influence of gender remained constant over 20 years. Naturally, as science advances, so does our society. It is essential to pay attention to how science is taught, how schools prepare their pupils and the variables that affect science learning.

Need and Importance of the Study:

The primary objective of education is to change children's behaviour so that it conforms to societal demands and expectations. Numerous factors define behaviour. The child's attitude has an impact on his overall personality and development. One's attitude affects how one learns and picks up habits, interests, and other mental dispositions. Therefore, the teacher must comprehend the significance of the attitude, its nature, and the variables that contribute to students' development. Learning science with a scientific mindset is a significant objective throughout the world. Values, attitudes, aptitudes, and appreciation is always a part of science education.

All youngsters must develop an interest in science and a good attitude toward it to succeed in today's technological and scientific world. Without forming a scientific perspective, it is also understood that no matter how much scientific information exists, it contributes to the process of national development and social change. Science educators stress the importance of acquiring a scientific perspective through science classes. The teacher is alone responsible for encouraging students to adopt a scientific attitude. This requires the teacher to influence any circumstance while also serving as a positive role model for the students.

Students are left with a favourable and long-lasting impression that encourages them to adopt the teacher's outlook. The first criterion is that science teachers should be idealistic and full of passion for pupils with a developed scientific viewpoint because enthusiasm a) assists in the context of a good curriculum. No one but a science teacher can help youngsters develop a scientific perspective on transactions by offering the best possible physical facilities and opportunities for helpful employment. As a result, the gradual development of a scientific mindset is facilitated by teachers' active desire to foster habits and action. In order to better understand this, the researcher is interested in exploring the "Role of Science Teachers in Developing Scientific Perspectives in Secondary School Students in Visakhapatnam District."

The researcher intends to determine role of role of science teachers in developing scientific attitudes among secondary school students in visakhapatnam district in this study.

Objective of the study

1. To study the perceptions of teachers towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.
2. To study the significant difference among the perceptions of teachers according to their demographic variables i.e., Gender, Academic Qualification, and age towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.

Hypotheses of the present study

- There is a high perceptions of teachers towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.
- There will be no significant difference among the perceptions of teachers according to their demographic variables i.e., Gender, Academic Qualification, and Age towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.

Design of the Study

The researcher conducted a thorough study using the survey approach. The survey used for this study was deemed an appropriate technique for gathering data.

Research Tool:

The purpose of the survey was to determine how science teachers contribute to secondary school students' development of scientific attitudes. The purpose of the survey was to learn how instructors felt about science teachers' role in helping secondary school students develop positive attitudes about science. The tool was created to test the hypothesis and learn more about science teachers' role in helping secondary school students develop positive attitudes about science. A total of 60 statements on a five-point scale—Strongly Agree/Agree, Undecided, Disagree, and Strongly Disagree—make up the final questionnaire. A request for open and honest responses from the teachers was made on the first page of the questionnaire. Additionally, a provision was made to provide the personal information of teachers under variables, namely gender, qualification, teaching experience, management, and locality.

Sample:

According to the research, the survey will be conducted 200 teachers which are located in Visakhapatnam district of Andhra Pradesh.

Statistical Techniques Used

The study involved careful statistical analysis, including computation of amplitude measurements like standard deviation and assessments of central orientation like mean. The researcher employed the Statistical Package for Social Sciences (SPSS) with correlation and the 't'-test to test the null hypothesis.

Table 1: Overall perceptions of teachers towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district.

N	Min.	Max.	Mean	Mean Percent	Std. Dev.
200	60	300	270.66	90.22	21.23

Table 1 shows that the, teachers expressed high perceptions towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district. The mean value was 270.66 and the mean percentages for all the areas were 90.22% on their total score.

Table - 2: Mean, SD and 't'/'F'- values on the perceptions of teachers based on their socio-economic variables towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district.

Variable	Category	N	Mean	SD	F/t-Value	p-value
Gender	Male	157	258.04	27.57	2.98**	0.00
	Female	68	253.75	27.38		
Age	Below 35	23	240.13	44.51	4.08**	0.00
	35 to 45	111	255.94	26.45		
	Above 45	91	261.92	22.29		
General Qualification	Degree	146	261.24	23.51	3.55**	0.00
	PG	79	248.43	33.08		

**Significant at 0.01, *Significant at 0.05 and NS:Not Significant

Interpretation

Table 2 revealed that the mean perceptual scores of teachers based on their gender towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district, the mean perceptual score of male category teachers was 258.04. In contrast, it is for the female category teachers was 253.75 and SD Values were 27.57 and 27.38, respectively. The derived t – value was 2.98, and the p-value was 0.00, which was statistically significant at the 0.01 level.

This shows a significant difference between the perceptions of male and female category teachers, and male category teachers perceived high towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that of female category teachers.

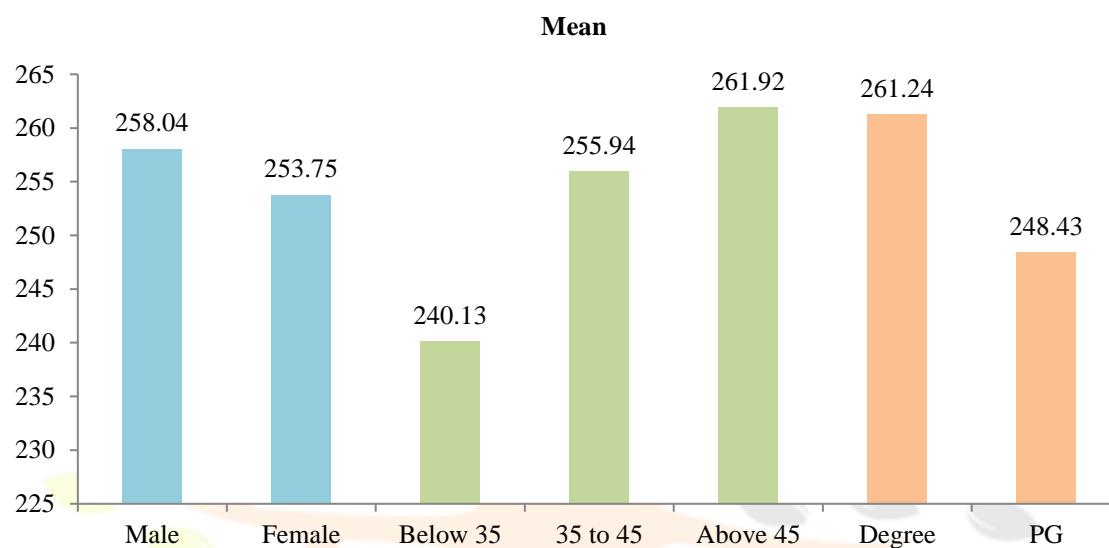
Concerning the Age group, the mean perceptual scores of teachers towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district, the mean perceptual scores of teachers below

35 years age group was 240.13. In contrast, it is for the 35 to 45 years age group was 255.94, and for the above 45 age group was 261.92, and the SD values were 24.13, 26.45 and 22.29, respectively. The 'F'-value was 4.08, and the p-value was 0.00, which was statistically significant at the 0.01 level.

This shows that there is a significant difference among the perceptions of teachers based on their age group and above 45 years age group teachers perceived high towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that below 35 and 35 to 45 years age group teachers.

Concerning General Qualification, the mean perceptual scores of teachers towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district, the mean perceptual scores of teachers for Degree qualification was 261.24. In contrast, it is for PG Qualification was 248.43, and the SD values were 23.51 and 33.08, respectively. The 't'-value was 3.55, and the p-value was 0.00, which was significant at the 0.01 level.

Graph-2: Mean comparison between the perceptions of teachers according to their Gender, Age and academic qualification with respect to Teacher Support to Learners



Findings and conclusions of the study:

- Teachers expressed high perceptions towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in the Visakhapatnam district.
- There is a significant difference between the perceptions of male and female category teachers, and male category teachers perceived high towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that of female category teachers.
- There is a significant difference among the perceptions of teachers based on their age group and above 45 years age group teachers perceived high towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that below 35 and 35 to 45 years age group teachers.
- There is a significant difference between the perceptions of Degree and PG qualified teachers, and Degree qualified teachers perceived high towards the role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that of PG qualified teachers.

Implication of the Study

- Science teachers need to inspire the science attitude among student community, as it is very much essential for the present-day scientific and technological world. Such that students may be able to work better in such a way to adjust themselves in the fastdeveloping scientific world.
- To encourage scientific attitude among students' purposeful preparation of scientific activities such as arranging scientific discussions, taking students to science exhibitions, fairs, excursions, field trips, conducting research in a novel way, allocating projects, give training to make improvised equipments which would be of use in day-to-day lives should be practice.
- Science education should focus on activities that support culture and the student's experience, which in one way or the other relates to their life's activities. By doing this, students will feel that their ideas/opinions are taken into account and are valued, which it will increase their self-concept in science. Emphasis should be made to make connection between science and student's life.
- Awareness should be given about Scientific Attitude and its importance in all round development and for nation building. Students should be encouraged to relate science knowledge and scientific method to solve real life situations.
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SUGGESTIONS FOR FURTHER RESEARCH

1. It is advised to do additional research on this topic using a considerable sample size due to the tiny sample size employed in the quantitative portion of this study. Thanks to the large sample size, it is possible to perform a comparison study that examines gender disparities in the attitudes of female and male teachers.
2. To assess teachers' subject-matter expertise, quantitative research is necessary.
3. Research that necessitates scrutiny of the nature and frequency of activities carried out in the classroom and the preferred modes of instruction and learning among the students.

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