



A Critical Analysis Of Science Teacher Perception Towards The Role Of Science Teacher In Developing Scientific Attitudes Among Secondary School Students

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Abstract:

Science faculty expanded the general objectives of science education to include the development of a scientific mindset. The term "scientific attitude" refers to the traits of intellectual curiosity, fervour for the truth, reverence for the veracity of evidence, and admiration for the value of open discourse in science. 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). Finally the researcher concluded that there is a significant difference among the perceptions of teachers according to their demographic variables i.e., Teaching Experience, School Management and Locality of the School towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.

Key words: Science, scientific attitude, Teaching Experience, School Management and Locality

Introduction:

Education's primary objective is to change a child's behaviour to conform to societal expectations and demands. Several symptoms go along with the behaviour. The child's attitude has an impact on his overall personality and development. Therefore, it is critical to comprehend the significance of the teacher's attitude, nature, and the aspects contributing to the student's development.

Scientific attitude

Science faculty expanded the general objectives of science education to include the development of a scientific mindset at the beginning of the twenty-first century. This mindset is sometimes referred to as having a "scientific mentality" (Burnett, 1944), having a "scientific idea habit" (Noll, 1933), or having "the spirit of science" (the Commission on Education Policy, 1966). If there is insufficient proof to overturn the decision, it will be made in the name of tights and a scientific viewpoint (Okay, 1982). Searching for the natural justifications for the scientific viewpoint's congregation; being receptive to the work and opinions of others and his own; forming judgments and coming to appropriate conclusions; employing methodologies and processes and information being evaluated; he is interested in noticing things.

According to Singh (1988), a scientific attitude is a collection of emotionally charged beliefs that are directly or indirectly related to the path of action in scientific literature, science education, and science education. The term "scientific attitude" refers to the traits of intellectual curiosity, fervour for the truth, reverence for the veracity of evidence, and admiration for the value of open discourse in science. Therefore, it is expected that the problem will be solved with a scientific attitude that is open-minded, the desire for accurate knowledge, seeking faith in methods, seeking knowledge, and employing confirmed knowledge. The stance in connection to a mental object in the realm of science is known as the scientific attitude.

According to Shekhar P. and Mani S. (2013), the scientific mindset is typically linked to mental processes. In daily life, these habits are crucial. Being wrong and lacking in judgement are two characteristics of scientific attitudes. The student's development of a scientific perspective is the responsibility of the teacher. Without a scientific viewpoint, scientific aims cannot be accomplished (Sharma, 2005). Higher education faculty, staff, and students currently lack scientific perspectives. A scientific viewpoint is necessary for both teachers and pupils. They must remove themselves from erroneous assumptions and crazy ideas.

An essential component of the science education research community's effort over the past 30 to 40 years has been student research on scientific studies. Growing evidence that young people's interest in continuing the scientific profession has decreased has highlighted its current importance (the Education Department 1994). Smithers and Robinson (1988), in conjunction with studies indicating widespread scientific illiteracy in the general public (Durant and Bauer 1997; Durant, Evans, and Thomas 1989; Miller, Pardo, 1997), and chosen to uphold the significance of the expanding identity and economic purpose of science (Smithers and Robinson 1988). Numbers have significantly increased social anxiety and discussion (for example, House of Lords 2000; Jenkins 1994; Lepcovska 1996).

Therefore, it is essential to encourage science, scientists, and other subjects valued in science education to learn science. However, the idea of attitude toward science is somewhat worse because it is frequently poorly articulated and poorly understood.

The characteristics of science in this situation:

One of the things that man invented was science, which he did so that he might satisfy some of his needs and desires. The main driving force behind the scientific inquiry is a keen interest. One of the main goals of scientific violence has evolved into the "quest for truth." It has been done for many centuries and has drawn the interest of many tenacious individuals. Science is most valuable for its application to real-world problems, but it is also deserving of great cosmetics to pique curiosity and serve as an attractive aesthetic object. The majority of humanity is deserving of the benefits that science mostly brings with it.

The modern world is scientific, and everyone is concerned with the state of science today. Today, it is impossible to imagine a world without science. In light of science's key position in the modern world, it is essential to advance science education in their nation and throughout the world. Every modern citizen cannot expect improved science education in the upper classes of science and technology until we successfully provide quality science education in schools, as opposed to the requirement that students be exposed to science every day while in school. It is accurate to state that practically every instant and turn of his day. Whether or not man is conscious of it, science impacts the modern world. By educating science pupils, we hope to modify their behaviour. Being a teacher is a highly demanding job that not everyone can do. Some persons may be "affectionate" teachers adept at grabbing students' interest.

Position of science in the educational curriculum:

The advancement of science and constructive endeavours are related to man's future. As a result, science ought to be valued in all educational curricula. Developed in India through NCERT initiatives, this idea has been turned into a subject required at every grade level.

Development of scientific attitude:

Other scientific values not found in any other topic are offered by science in the curriculum. Things from school are taught because they offer a liberal education; they are a component of the tools and preparation for the life we expect to give our pupils so they can contribute to society as brilliant citizens. Like all disciplines taught in schools, science is crucial to one's education. It teaches and comprehends the fundamentals of both living and non-living objects. Additionally, Learning Science offers the opportunity to practice the scientific method, strengthening a scientific viewpoint and adding credibility to the facts. Students who pursue science and science education benefit greatly from having a scientific mindset. In the Philippines, there is a significant expression of this expanding understanding of the value and significance of science.

Science is the first subject that has seen the most alterations to the nation's core curriculum to address issues of quality and relevance. The trend is dealing with the facts rather than what someone says about them. Additionally, science as a discipline provides many significant benefits. Learning about science develops students' scientific viewpoints and provides training in the scientific method. Although most people believe it to be related to the subject of knowledge, some people perceive the scientific perspective as a by-product of teaching. The most significant result of the scientific perspective is the most significant result of science instruction. A major issue in the science education process is the scientific mindset. Teachers should never forget the following: open-mindedness, desire for precise knowledge; the problem of confidence and confidence in the practices of knowledge acquisition; and the characteristics of scientific perspective. They were motivated by thought and investigation. Science courses accept the theory; they never help students develop a scientific mindset. For students' brains to have the chance to experience and develop the components of the scientific perspective, they should be able to practice and examine science.

Need and Significance of the study

The only person who has the power to influence all the factors that can improve a student's scientific approach and who can also serve as a positive role model is the instructor. Students who adopt the same approach toward the teacher are left with a positive, lasting impression. The first prerequisite is that science teachers should be ideal for students with a developed scientific perspective and be enthusiastic because excitement can help in the case of effective textile transactions and provide opportunities for practical work. No one can encourage a scientific outlook in children better than a science teacher. As a result, teachers' active desire to form habits and take action results in the progressive development of a scientific mentality.

Secondary education Adolescence is a stressful and turbulent time for students who are in school. They must be guided and counselled throughout this time, or else the incorrect adjustment issue may occur. Adolescents succeed in all aspects of life and education if they have a good mentor and are inspired by the correct educational objectives. Millions of rupees are spent by governments on postsecondary education. However, the price is not going to come down. Only 40 to 60 per cent of kids succeed, which is also due to private schools' assistance. In other words, two-thirds of the money spent on education is wasted. With so many pupils failing at the secondary school level, this study's findings aim to improve the existing situation for educational plans, teachers, and students. Therefore, the current effort has been undertaken to research secondary school students' attitudes towards science.

Since attitude reveals a person's interior perspective, it is crucial for education. A person will make every effort to accomplish a goal if they have a good attitude toward it. He will try to avoid something if he has a bad attitude toward it. As a result, attitude is crucial in deciding a person's success or failure in any endeavour. The scientific mindset is the desire to learn about one's surroundings, and natural causes can always explain the conviction that nothing occurs randomly and that mysterious or odd events. A scientist has the abilities and mindset required to use the scientific method, as well as the knowledge that can only be learned through this method. The most significant outcomes of science education are positive scientific attitudes. By educating science, we can help our pupils acquire qualities like social morals and the ability to make decisions based on accurate knowledge, reason, and honesty. As a result, the instructor is crucial in helping students adopt a scientific mindset. It is natural for primary school pupils to excel in their job if they have a scientific perspective. Therefore, the researcher investigates how science teachers perceive their role in encouraging scientific attitudes among secondary school students.

Objective of the study

1. To evaluate the Overall 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., Teaching Experience, School Management and Locality of the School towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.

Hypotheses framed:

1. There would be no significant difference among the perceptions of teachers according to their demographic variables i.e., Teaching Experience, School Management and Locality of the School 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.

Objective 1

To evaluate the Overall perceptions of teachers towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district.

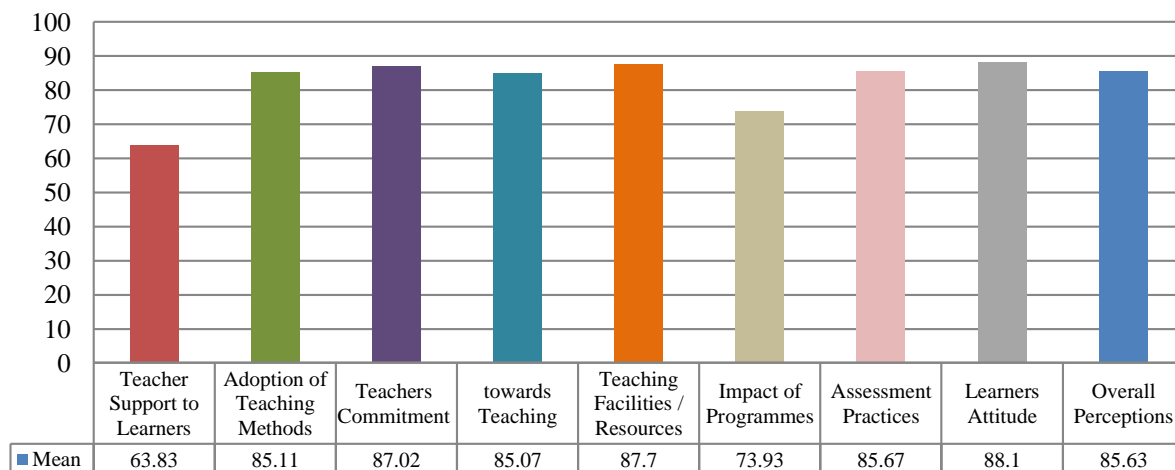
Table 1: Overall perceptions of teachers towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district.

Area	N	Min.	Max.	Mean	Mean Percent	Std. Dev.
Teacher Support to Learners	225	15	75	63.83	85.11	5.62
Adoption of Teaching Methods	225	25	125	108.77	87.02	12.04
Teachers Commitment towards Teaching	225	16	80	68.05	85.07	9.10
Teaching Facilities / Resources	225	18	90	78.93	87.70	10.33
Impact of Programmes	225	6	30	22.18	73.93	3.55
Assessment Practices	225	9	45	38.55	85.67	4.62
Learners Attitude	225	6	30	26.43	88.10	4.14
Overall Perceptions	225	95	475	406.74	85.63	41.23

Table 1 shows that the, teachers expressed high perceptions with respect to the areas viz., Teacher Support to Learners, Adoption of Teaching Methods, Teachers Commitment towards Teaching, Teaching Facilities / Resources, Impact of Programmes, Assessment Practices, Learners Attitude and Overall Perceptions towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district. The mean values for all the areas were 63.83, 108.77, 68.05, 78.93, 22.18, 38.55, 26.43 and 406.74 and the mean percentages for all the areas were 85.11%, 87.02%, 85.07%, 87.70%, 73.93%, 85.67%, 88.10% and 85.63% on their total score.

1. Bar diagram shows the information Overall perceptions of teachers

Mean



Objective-2

To study the significant difference among the perceptions of teachers according to their demographic variables i.e., Teaching Experience, School Management and Locality of the School towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.

Hypotheses:

1. There would be no significant difference among the perceptions of teachers according to their demographic variables i.e., Teaching Experience, School Management and Locality of the School towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.

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
Teaching Experience	Below 10	24	237.50	36.23	3.11*	0.03
	10 to 20	102	256.90	30.42		
	Above 20	99	261.24	20.38		
Management	Government	154	248.72	22.29	3.68**	0.00
	Municipal	35	258.25	28.78		
	Private	36	255.29	22.59		
Locality	Rural	120	259.15	27.48	4.86**	0.00
	Urban	60	253.47	23.52		
	Tribal	45	227.33	39.37		

**Significant at 0.01, *Significant at 0.05

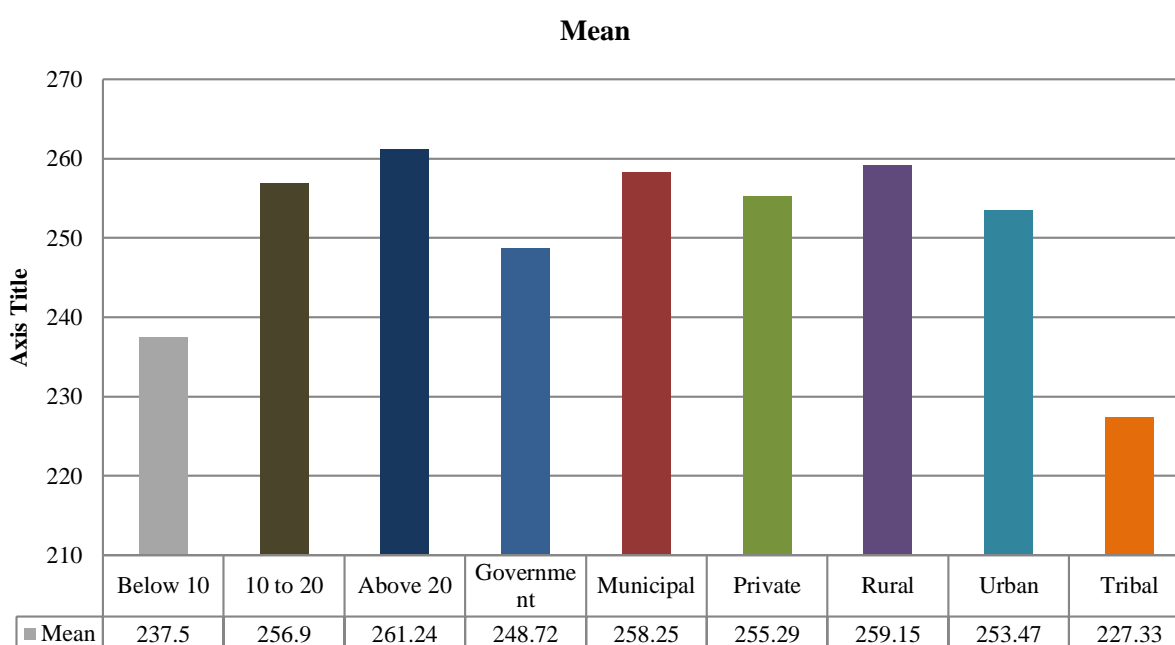
With regard to Teaching Experience, the mean perceptual scores of teachers towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district, the mean perceptual scores of teachers for below 10 years was 237.50, whereas it is for 10 to 20 years was 256.90 and it for above 20 years was 261.24 and the SD values were 36.23, 30.42 and 20.38 respectively. The 'F'-value was 3.11 and the p-value was 0.03, which was significant at 0.05 level. This shows that, there is a significant difference among the perceptions of teachers based on their teaching experience

and above 20 years teaching experience category respondents perceived high towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that of below 10 and 10 to 20 years teaching experience category teachers.

With respect to school management, the mean perceptual scores of teachers towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district, the mean perceptual score of teachers working in Government schools was 248.72, whereas it is for the Municipal Schools was 258.25 and it was for teachers working in Private schools was 255.29 and SD Values were 22.29, 28.78 and 22.59 respectively. The derived F – value was 3.68 and the p-value was 0.00 which was statistically significant at 0.01 level. This shows that, there is a significant difference among the perceptions of teachers based on their school management and Municipal school teachers perceived high towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that of Government and Private school teachers.

With regard to Locality, the mean perceptual scores of teachers towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district, the mean perceptual scores of rural area category teachers was 259.15, whereas it is for urban area category teachers was 253.47, and it was for tribal area category teachers was 227.33 and the SD values were 27.48, 23.52, and 39.37 respectively. The 'F'-value was 4.68 and the p-value was 0.00, which was statistically significant at 0.01 level. This shows that, there is a significant difference among the perceptions of teachers based on their locality and rural area teachers expressed high perceptions towards role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam district than that of urban and tribal area teachers.

2. Bar diagram shows the information of teachers- teaching experience, school management type, locality- mean



Findings:

1. Teachers' perceptions fluctuate significantly depending on how long they have been teaching and if they fall into the category of teachers with more than 20 years of experience. In comparison to teachers with less than ten and more than 20 years of teaching experience, respondents gave science teachers in the Visakhapatnam area a higher rating for their contribution to developing scientific attitudes among secondary school students.

2. In the Visakhapatnam district, municipal school teachers, compared to government and private school teachers, had higher perceptions of the importance of science teachers in fostering scientific attitudes among secondary school students. This difference between perceptions was statistically significant.

3. The perceptions of teachers vary significantly depending on where they live, with rural teachers in the Visakhapatnam district having higher opinions of the contribution that science teachers make to the formation of scientific attitudes among secondary school students than urban and tribal teachers.

Educational implications:

- 1) The study provides insight into science teachers' opinions and attitudes toward science.
- 2) This study contributes to understanding how scientific programmes are implemented in secondary schools.
- 3) This study demonstrates the attitude levels in both the public and private sectors.
- 4) A good science instructor may instil a scientific mindset in their pupils.
- 5) This study shows that science teacher are supportive of secondary students' development of a scientific mindset.

Conclusion:

The researcher discovered that teachers having a scientific approach and perspective could successfully improve secondary school pupils' scientific attitude. Consequently, a science teacher can conclude that they play a significant part in forming a student's scientific perspective, so teacher a). Follow the intended approaches to work impartially, from a broader perspective, and away from superstitious notions. Teachers must teach students how to apply their knowledge to real-world situations and link science to other subject areas. Finally the researcher concluded that there is a significant difference among the perceptions of teachers according to their demographic variables i.e., Teaching Experience, School Management and Locality of the School towards Role of Science Teachers in Developing Scientific Attitudes among Secondary School Students in Visakhapatnam District.

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