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# A Study of Scientific Attitude as Predictors of Achievement in Science of Class X Students: Analysing Socio-Demographic Variables in Private Vs. Government Schools, Telugu Medium Vs. English Medium

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**Abstract**

Scientific attitude encourages students to question assumptions, evaluate evidence, and make informed decisions. This critical thinking skill is essential not only for science but for all areas of learning and daily life. A scientific attitude promotes systematic problem-solving approaches. Students learn to identify problems, formulate hypotheses, conduct experiments, and analyse results, which are crucial skills for tackling complex issues in various fields. Developing a scientific attitude nurtures curiosity and a desire to explore and understand the world. This inquisitiveness drives students to seek knowledge, conduct research, and stay engaged in lifelong learning. This study aims to explore the relationship between scientific attitude and academic achievement in science among Class X students, considering socio-demographic variables such as type of school (private vs. government) and medium of instruction (Telugu vs. English). By examining these factors, we aim to identify how scientific attitudes influence science achievement and how these influences vary across different educational contexts.

**Keywords:** Scientific Attitude, Scientific Attitude Scale, Government, Private, Telugu and English medium.

## Introduction

The pursuit of scientific literacy has become a cornerstone of modern education, reflecting the growing importance of science and technology in our daily lives. As nations strive to compete in an increasingly knowledge-driven global economy, the quality of science education in schools becomes a critical focus. Among the various factors influencing students' achievement in science, their scientific attitude stands out as a significant predictor. A scientific attitude encompasses curiosity, skepticism, open-mindedness, and a methodological approach to problem-solving, all of which are crucial for success in science subjects.

This study seeks to explore the relationship between scientific attitude and science achievement among Class X students, with a specific focus on socio-demographic variables. The investigation delves into the comparative analysis of students from private versus government schools and those from Telugu medium versus English medium schools. By understanding these dynamics, educators and policymakers can better tailor educational strategies to enhance science learning outcomes.

In the Indian educational landscape, schools are broadly categorized into private and government institutions, each with distinct characteristics and resources. Private schools often boast better infrastructure, smaller class sizes, and more qualified teachers, potentially offering a more conducive environment for fostering scientific attitudes. Conversely, government schools, though sometimes lacking in resources, serve a larger proportion of the population and often reflect a broader socio-economic diversity.

Another critical dimension of this study is the medium of instruction. In India, English is widely regarded as the language of global communication and higher education, while Telugu, the regional language in states like Andhra Pradesh and Telangana, is commonly used in local schools. The medium of instruction can significantly impact students' comprehension, engagement, and overall academic performance, thereby influencing their scientific attitudes and achievements.

By analysing these socio-demographic variables, this study aims to uncover patterns and insights that can inform targeted interventions to improve science education. The findings will contribute to a deeper understanding of how different educational contexts and student backgrounds influence scientific attitudes and achievements, ultimately guiding efforts to bridge gaps and elevate science education standards across diverse school settings.

## REVIEW OF RELATED LITERATURE

**Ozgelen (2012)** delved into the examination of students' science process skills, employing a cognitive domain framework. students attending private schools demonstrated notably higher scores in scientific process skills compared to their counterparts in public.

**Ksheerasagar and Kavyakishore (2013)** conducted an observational study investigating the science achievement of 600 secondary school students in relation to their scientific attitudes. Students enrolled in private schools demonstrated superior science achievement compared to their counterparts in Government schools.

**Visiezolie Yashu et al. (2016)** conducted a study aimed at determining the attitudes towards scientific interests among tribal students. The findings of the study unveiled significant differences between tribal students attending private and Government secondary schools in terms of their scientific interests and curiosity. Specifically, tribal students from private secondary schools exhibited a higher level of scientific interest and curiosity compared to their counterparts in Government secondary schools.

**Jancirani R, Dhevakrishnan R, Devi S. (2012),** delved into an investigation on the scientific attitudes prevalent among adolescent students in the Namakkal district. This study suggests that the medium of instruction may influence students' scientific attitudes, with students from English medium schools displaying a more positive disposition towards science compared to those from Tamil medium schools.

**Yeli R. S., Sadiqa A., Dafedar (2013)** examined the correlation between scientific aptitude and learning achievement among secondary school students. urban students demonstrate significantly higher scientific aptitude scores compared to their rural counterparts. Similarly, English medium school students exhibit significantly greater scientific aptitude scores than those in Kannada medium schools.

## OBJECTIVES OF THE STUDY:

The following objectives are framed for the present study.

1. To find out the level of Scientific Attitude of class X students.
2. To find out whether there is any significant difference in the Scientific Attitude of class X students

with reference to Socio- demographic variables namely management of schools and medium of instruction.

**HYPOTHESES:**

The following null hypotheses were formulated for the purpose of testing –

**I :** "There would be no significant difference in the Scientific Attitude of class X students with reference to Management of School."

**II** : "There would be no significant difference in the Scientific Attitude of class X students with reference to Medium of Instruction." To test the above null hypotheses 't' test is used.

**SCOPE OF THE STUDY:**

The present investigation attempts to find out Scientific Attitude and Attitude towards Science of X class students as predictors on Achievement of Science. The present study gives immense importance to the level of Scientific Attitude of X class students comparing based on management of schools and medium of instructions.

**DATA COLLECTION**:

Surveys and academic records collection from participating schools.

**SAMPLE:**

The sample was collected by using Simple Random Sampling Technique. The schools under government and private Management of urban and rural areas were sort out. From each locality 6 Government high schools and 6 private high schools were selected. Totally 24 schools were selected in that 12 from urban area and 12 from rural area. Thus, after selecting the high schools, the investigator personally visited the selected high schools. From each locality, that is from urban locality 375 students from government schools, 375 students from private schools and from rural locality 375 students from government schools, 375 students from private schools were taken into consideration for data collection. The total sample of 1500 high school students of class X were equally distributed between both genders, between both localities, and among the two managements of government and private the schools.

**TOOLS FOR THE STUDY:**

Scientific Attitude Scale (Self Made Tool)

**ANALYSIS OF CLASS X STUDENTS' LEVEL OF SCIENTIFIC ATTITUDE:**

Scientific Attitude was analysed according to the following objectives,

- To find out the level of Scientific Attitude of class X students.
- To find out whether there is any significant difference in the Scientific Attitude of class X students with reference to Socio- demographic variables namely Management of Schools and Medium of instruction**.**

**a) Level of Scientific Attitude:**

The total sample of class X students was divided into three groups namely – High level of Scientific Attitude Group, Moderate level of Scientific Attitude Group and Low level of Scientific Attitude Group.

In the present study, among the 1500 respondents, 476 (31.7%) of students exhibited High level of Scientific Attitude, 495 (33%) of students exhibited, Moderate level of Scientific Attitude and 529 (35.3%) of students exhibited Low level of Scientific Attitude.

**Table 1: Level of Scientific Attitude Vs Socio - demographic variables of class X students**

| S. No. | Socio -demographic variables | | Levels of Scientific Attitude | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Low (Below 129.852) | | Moderate (Between 129.82 – 143.388) | | High (Above 143.388) | |
| | | | No. of students | % of students | No. of students | % of students | No. of students | % of students |
| 1. | Management of school | Govt. | **311** | 41.5 | **224** | 29.9 | **215** | 28.7 |
| | | Private | **218** | 29.1 | **271** | 36.1 | **261** | 34.8 |
| 2. | Medium of instruction | Telugu | **170** | 39.9 | **135** | 31.7 | **121** | 28.4 |
| | | English | **359** | 33.4 | **360** | 33.5 | **355** | 33.1 |

**Management of Schools:**

Table-1 shows that among 750 of class X students in government schools the frequency of low level of Scientific Attitude is shown among 311(41.5%), Whereas class X students in private schools the frequency of low level of Scientific Attitude is shown among 218(29.1%). Moderate level of Scientific Attitude is shown among 224(29.9%) of students studying in government schools, whereas the students studying in private school the low level of Scientific Attitude is shown among 271(36.1%). The high level of Scientific Attitude is shown among 215(28.7%) of government school students, whereas in private school class X students the frequency of high level of Scientific Attitude is shown among 261(34.8%).

**Medium of Instruction:**

From the above table 1, among 426 class X students in Telugu medium schools the frequency of low level of Scientific Attitude is shown among 170(39.9%). Whereas among 1074 class X students in English medium schools the frequency of low level of Scientific Attitude is shown among 359(33.4%). Moderate level of Scientific Attitude is shown among 135(31.7%) Telugu medium class X students. Whereas class X students in English medium schools the frequency of moderate level of Scientific Attitude is shown among 360(33.5%). The high level of Scientific Attitude is shown among 121(28.4%) Telugu medium students, whereas the frequency of high level of Scientific Attitude among English medium students is 355(33.1%).

**b) Scientific Attitude Vs Socio-demographic variables:**

**Table - 2:Mean, SD and 't' values for the scores of Scientific Attitudes of Class X students with reference to Socio-demographic variables**

| S. No | Socio-Demographic variables | Categories | N | Mean | SD | 't' Values |
|---|---|---|---|---|---|---|
| 1. | Management of school | Govt. | 750 | 135.12 | 13.917 | 4.328** |
| | | Private | 750 | 138.12 | 12.983 | P = 0.000 |
| 2. | Medium of Instruction | Telugu | 426 | 135.31 | 13.804 | 2.373* |
| | | English | 1074 | 137.14 | 13.400 | P = 0.018 |

Note: @ Not significant at 0.05 level
*Significant at 0.05 level
**Significant at 0.01 level

**Management of Schools:**

**Hypotheses I:**

**"**There would be no significant difference in the Scientific Attitude of class X students with reference to Management of School."

From the table – 2, it is observed that there is significant difference found between private school management and government school management. Scientific Attitude of private school management of class X students is higher when compared to the students studying in government schools. The mean difference is 3.008. The 't' value for class X students', Scientific Attitude is significant at 4.328 (P = 0.000). Therefore, it is stated that there is significant difference between private and government schools of class X students in their Scientific Attitude. Hence the formulated Hypothesis- **I '**There would be no significant difference in the Scientific Attitude of class X students with reference to Management of School' is rejected.

**Medium of Instruction:**

**Hypotheses II:**

**"**There would be no significant difference in the Scientific Attitude of class X students with reference to Medium of Instruction." To test the above null hypotheses 't' test is used.

From the table – 2 it is observed that there is significant difference found between Telugu medium and English medium. The scores pertaining to Scientific Attitude English medium of class X students is higher than the students studying in Telugu medium. The mean difference is 1.836. The 't' value for secondary school students' Scientific Attitude is significant at 2.373 (P=0.018). Therefore, it is stated that there is significant difference among Telugu and English medium schools of class X students in their Scientific Attitude. Hence the formulated Sub Hypothesis- **II** 'There would be no significant difference in the Scientific Attitude of class X students with reference to Medium of instruction' is rejected.

**MAJOR FINDINGS:**

**a) Level of Scientific Attitude Vs Socio - demographic variables of class X students:**

- From table – 1, it is observed that the frequency of High level of Scientific Attitude was found among students studying in private schools 261(34.8%), when compared to students studying in government schools 215(28.7%).
- From the above table it is observed that the frequency of High level of Scientific Attitude was found among students studying in English medium schools 355(33.1%), when compared to students studying in Telugu medium 121(28.4%).

**b) Scientific Attitude Vs Socio-demographic variables:**

- The result shows (table -2) that there was significant difference between private and government school students in their Scientific Attitude. The result revealed that private students exhibited higher Scientific Attitude than government school students.
- There was significant difference between (table -2) Telugu and English medium schools of class X students in their Scientific Attitude. The result revealed that English medium students exhibited higher

Scientific Attitude than the Telugu Medium students.

## EDUCATIONAL IMPLICATIONS

- The present study showed that nearly 70 % of government school students are scored under moderate and low level of Scientific Attitude. The government schools should conduct seminars, workshops sessions to carter the importance of Scientific Attitude such that to develop scientific interest. Government school management in Andhra Pradesh is now taking care about the improvement of school atmosphere and class atmosphere in urban area, simultaneously rural area also takes it into consideration in development. Parents belonging to rural area should not depend completely on school about their children's education, they should pay equal care as the school taken on their children.
- The present study it was clearly stated that nearly 70 % of Telugu Medium students' scores were under moderate and low level of Scientific Attitude. Students of Telugu medium may be less confident about their capabilities, they may feel inferior about themselves. Government must take steps to enhance self-confidence. Programmes such as brainstorming session, debate on current science topics, collection of scientific inventions, assigning science assignments under various science related topics, group discussion need to be conducted regularly in Government schools to improve Scientific Attitude among them.

## RECOMMENDATIONS

- Quality and competence of any educational institution is determined by the role played by its teachers and higher authority. Therefore, it is a must for the Government and concerned authorities to be impartial in recruiting the teachers who can work hard for developing Scientific Attitude among students. Teachers must be given in service trainings periodically to improve the Scientific Attitude of students and create congenial environment for students to engage, explore, explain, elaborate and evaluate so that learning becomes a joyful activity to the students.
- To maintain the high levels of Scientific Attitude observed among class X students, particularly in terms of traits like open-mindedness, skepticism towards superstitions, curiosity, and objectivity, efforts should be directed towards sustaining these aspects. However, there is room for improvement in certain areas, such as rationality and the ability to suspend judgment, where Scientific Attitude was found to be moderate.

## CONCLUSION

In the present study, notable variations were observed in the Scientific Attitude of class X students across the socio-demographic variables Management of Schools, and Medium of Instruction. Given these findings, it is imperative for educational planners and administrators to prioritize the implementation of regular training programs for teachers, particularly in government schools. These training initiatives should aim to enhance teachers' skills in fostering Scientific Attitude among class X students. By equipping teachers with effective strategies and methodologies, educators can play a pivotal role in cultivating a positive attitude towards science among students, irrespective of their socio-demographic backgrounds.

## Reference:

1. **Ksheersagar, S. and Kavyakishore, P.B. (2013).** Achievement in Science of secondary school

students in relation to scientific attitude. Int. J. Edu. Psychological Res., 2(2): 61-65.

2. **Jancirani, R., Dhevakrishnan, R., Devi, S. (2012)** A Study on Scientific Attitude of Adolescence Students in Namakkal District. International Educational E-Journal, {Quarterly}, ISSN 2277-2456, Volume-I, Issue-IV, July-Aug-Sept 2012.
3. **Ozgelen, S. (2012).** Students' Science Process Skills within a Cognitive Domai Framework. *Eurasia Journal of Mathematics, Science and Technology Education, 8*(4), 283-292. https://doi.org/10.12973/eurasia.2012.846a.
4. **Visiezolie Yashu, et al. (2016),** A Study of attitude towards the scientific interests of tribal students at secondary level in Kohima. IJMRME: 2(1), ISSN (Online): 2454 – 6119.
5. **Yeli, R. S., Bijapur, K. S. W. U., and Dafedar, S.A. (2013).** Learning achievement in science of secondary school students in relation to their Scientific Aptitude. Educational Indexed & Refereed Research Journal IV (4).