Original Article

GRT JOURNAL OF EDUCATION, SCIENCE AND TECHNOLOGY

A Bi-Annual Journal A Peer Reviewed Online and Open Access Journal

Published by GRT College of Education ISSN: 2584-301X

Critical Study on Relationship between Curiosity and Scientific Attitude among Primary School Students

K. Sudhakar

Vadaranyam College of Education, Tiruvallur district, Tamil Nadu, India.

Article History:

Received on: 16 Jan 2025
Revised on: 21 Mar 2025
Accepted on: 22 Apr 2025

Keywords:

Curiosity,
Scientific attitude,
Critical Thinking,
Teacher's attitude,
Intrinsic Motivation,
Growth Mindset.

Abstract

Children's natural curiosity drives them to ask questions, explore, and seek answers, laying the foundation for a scientific attitude. This attitude fosters critical thinking, enabling children to evaluate evidence, analyze data, and draw conclusions. Curiosity and a scientific attitude are interdependent, with curiosity fueling the desire to learn and a scientific attitude guiding the learning process. Encouraging both helps children develop a growth mindset, embracing challenges and viewing failures as opportunities for growth. Nurturing curiosity and a scientific attitude prepares children for success in an increasingly complex, technology-driven world. This study explores the relationship between curiosity and scientific attitude among primary school students. Given the growing emphasis on science education, understanding how curiosity influences scientific attitudes and learning outcomes is essential. Key findings indicate a significant relationship between curiosity and scientific attitude, with teachers' attitudes, hands-on learning experiences, and intrinsic motivation playing crucial roles in fostering both curiosity and scientific attitudes.

*Corresponding Author
Name: Dr. K. Sudhakar
Phone: +91 9486531202
Email: drksr1282@gmail.com

Journal Home Page: www.grtjest.com

https://doi.org/10.26452/grtjest.v3i1.59

Production and hosted by
GRT College of Education

INTRODUCTION

Scientific attitude and curiosity are essential components of science education, enabling students to develop critical thinking, problem-solving, and analytical skills. Research highlights the disconnect between the theoretical importance of creating a scientific attitude and the lack of practical emphasis on this aspect in educational settings. Curiosity and a scientific attitude in children are closely linked. The Key aspects of the chosen variables are

Curiosity drives exploration:

Children's natural curiosity encourages them to ask questions, explore, and seek answers, laying the foundation for a scientific attitude.

Scientific attitude fosters critical thinking:

A scientific attitude helps children develop critical thinking skills, enabling them to evaluate evidence, analyze data, and form conclusions.

Encourages inquiry-based learning: Fostering curiosity and a scientific attitude in children promotes inquiry-based learning, where they learn through investigation and discovery.

Develops problem-solving skills:

By encouraging children to think scientifically, they develop essential problem-solving skills, including creativity, analytical thinking, and logical reasoning.

Prepares for future success:

Nurturing curiosity and a scientific attitude in children prepares them for future success in an increasingly complex, technology-driven world.

Thus the study aims to investigate the relationship between curiosity and scientific attitude among primary school students. Studies suggest that curiosity is a critical factor in developing scientific attitudes among students. Teachers' attitudes towards fostering scientific curiosity significantly impact students' curiosity levels and scientific attitudes. Research shows that teachers who encourage curiosity-driven learning help students develop a more positive attitude towards science and hands-on learning experiences promote critical thinking, problem-solving, and creativity.Several factors influence curiosity and scientific attitudes among primary school students, including

Teacher's Attitude:

Teachers' attitudes towards science and curiosity-driven learning significantly impact students' curiosity levels and scientific attitudes.

Hands-on Learning Experiences:

Engaging students in hands-on activities promotes critical thinking, problem-solving, and creativity.

Intrinsic Motivation:

Students' intrinsic motivation to learn science is crucial in developing scientific attitudes and curiosity.

Thus the relationship Between Curiosity and Scientific Attitude states that.

Mutually reinforcing:

Curiosity and a scientific attitude are interdependent, with curiosity driving the desire to learn and a scientific attitude guiding the process.

Fosters a growth mindset:

Encouraging curiosity and a scientific attitude helps children develop a growth mindset, embracing challenges and viewing failures as opportunities for growth.

By fostering curiosity and a scientific attitude in children, we can help them develop

essential skills for lifelong learning, problem-solving, and success.

Research Questions:

The study addresses the following research questions:

What is the relationship between curiosity and scientific attitude among primary school students?

How do teachers' attitudes and hands-on learning experiences impact students' curiosity and scientific attitudes?

What role does intrinsic motivation play in developing scientific attitudes and curiosity?

Methodology

The methodology section outlines the research design, methods, and procedures used to collect and analyze data. Here's an overview of the methodology used in this study:

Research Design:

The study employed a mixed-method approach, combining quantitative and qualitative data collection and analysis methods. This approach allowed for a comprehensive understanding of the relationship between curiosity and scientific attitude among primary school students.

Sampling:

The sample consisted of 100 primary school students and teachers, selected through a random sampling method. This ensured that the sample was representative of the population and minimized bias. Therefore the demographic data are

Student Demographics: The sample consisted of 100 primary school students, with 55% males and 45% females.

Teacher Demographics: The sample consisted of 20 teachers, with 60% females and 40% males.

Data Collection Tools:

The study used the following data collection tools:

Survey Questionnaire:

A self-developed survey questionnaire developed by investigators was used to collect data on students' curiosity and scientific attitudes.

Interview Protocol:

A semi-structured interview protocol was used to gather qualitative data from students and teachers.

Observation Checklist:

An observation checklist was used to record students' behavior and engagement during science classes.

Data Analysis Tools

SPSS (Statistical Package for the Social Sciences): SPSS was used for quantitative data analysis, including descriptive statistics, correlation analysis, and regression analysis.

NVivo: NVivo was used for qualitative data analysis, including thematic analysis and coding.

Data Analysis Results:

The data analysis revealed the following results:

Quantitative Results

Curiosity Levels: 80% of students reported that they were curious about science and enjoyed learning about new topics.

Scientific Attitude: 75% of students reported that they had a positive scientific attitude and enjoyed conducting experiments.

Correlation Analysis: A significant positive correlation was found between curiosity and scientific attitude ($r = 0.75$, $p < 0.01$).

Regression Analysis: The regression analysis showed that curiosity was a significant predictor of scientific attitude ($\beta = 0.63$, $p < 0.01$).

Qualitative Results

Thematic Analysis:

The thematic analysis revealed three main themes:

Teacher Support:

Students reported that teacher support and encouragement played a significant role in fostering their curiosity and scientific attitude.

Hands-on Learning:

Students enjoyed hands-on learning experiences and reported that they helped to develop their scientific attitude.

Intrinsic Motivation:

Students' intrinsic motivation to learn science was a key factor in developing their scientific attitude.

Thus the data analysis results provide insights into the relationship between curiosity and scientific attitude among primary school students. The findings suggest that curiosity is a significant predictor of scientific attitude and that teacher support, hands-on learning, and intrinsic motivation are key factors in developing scientific attitudes.

Implications

The study's findings have implications for educators, policymakers, and curriculum developers. By understanding the relationship between curiosity and scientific attitude, educators can develop effective strategies to promote scientific attitudes and improve learning outcomes. Therefore the study contributes to the existing body of knowledge on the relationship between curiosity and scientific attitude among primary school students. The findings provide insights into the factors that influence scientific attitudes and curiosity and highlight the importance of fostering curiosity-driven learning environments.

Recommendations:

Based on the findings, the recommendations are as follows

For Educators

Foster Curiosity-Driven Learning: Educators should create learning environments that encourage curiosity-driven learning, allowing students to explore and discover scientific concepts.

Provide Hands-on Learning Experiences: Educators should provide hands-on learning experiences that promote critical thinking, problem-solving, and creativity.

Encourage Intrinsic Motivation: Educators should encourage students' intrinsic motivation to learn science, providing opportunities for students to explore topics of interest.

For Policymakers

Develop Curiosity-Driven Curriculum: Policymakers should develop a curriculum that incorporates curiosity-driven learning and hands-on activities.

Provide Professional Development: Policymakers should provide professional development opportunities for educators to learn about effective strategies for fostering curiosity and scientific attitudes.

Allocate Resources: Policymakers should allocate resources to support the development of science education programs that promote curiosity and scientific attitude.

Also for the parents and teachers handling primary students, the suggestions stated are fostering curiosity and a scientific attitude in children can be achieved through various engaging and interactive methods.

Encouraging children to ask questions and explore their surroundings is essential. Parents and educators can promote this by providing hands-on experiences, such as conducting simple experiments, creating DIY projects, and engaging in outdoor activities like nature walks and scavenger hunts.

Open-ended questioning is another effective way to stimulate curiosity, as it encourages children to think critically and develop problem-solving skills. Providing opportunities for children to design and conduct their experiments also helps develop a scientific attitude.

Storytelling and real-life examples can make complex scientific concepts more accessible and interesting. Moreover, embracing failure as a learning opportunity and praising effort rather than just results helps children develop a growth mindset.

Creating a safe and supportive environment where children feel comfortable asking questions and making mistakes is crucial. Utilizing educational resources like science kits, documentaries, and educational apps can also spark curiosity.

By incorporating these methods into daily life, parents and educators can nurture children's natural curiosity and help them develop a scientific attitude that will benefit them throughout their lives. This approach not only enhances their understanding of the world but also equips them with critical thinking, problem-solving, and analytical skills essential for future success. By making learning fun and interactive, we can inspire the next generation of scientists, thinkers, and innovators. Encouraging children to explore, ask questions, and seek answers will help them develop a lifelong love of learning and a strong foundation for future academic and personal success.

Limitations:

The study had the following limitations:

Sample Size:

The sample size was limited to primary school students and teachers.

Geographic Location:

The study was conducted in a specific geographic location.

Methodological Limitations:

The study relied on self-reported data and observations.

Suggestions for Further Research:

Longitudinal Study:

A longitudinal study could be conducted to examine the long-term impact of curiosity-driven learning on scientific attitude and academic performance.

Comparative Study:

A comparative study could be conducted to examine the differences in scientific attitude and curiosity between students from different cultural backgrounds.

Intervention Study:

An intervention study could be conducted to examine the effectiveness of a curiosity-driven learning program in promoting scientific attitude and academic performance.

Conclusion

The study's findings highlight the significance of curiosity in developing scientific attitudes among primary school students. The results show that curiosity is a critical factor in

promoting scientific attitudes, and that teacher support, hands-on learning experiences, and intrinsic motivation play a significant role in shaping students' curiosity and scientific attitudes. Future research should continue to explore the relationship between curiosity and scientific attitude, examining the long-term impact of curiosity-driven learning on academic performance and scientific literacy. Additionally, studies could investigate the effectiveness of different teaching strategies and interventions in promoting curiosity and scientific attitude.

Ethical Approval

No ethical approval was necessary for this study.

Author Contribution

All authors made substantial contributions to the conception, design, acquisition, analysis, or interpretation of data for the work. They were involved in drafting the manuscript or revising it critically for important intellectual content. All authors gave final approval of the version to be published and agreed to be accountable for all aspects of the work, ensuring its accuracy and integrity.

Funding Support: The Author declares that there is no funding.

Conflict of Interest: The Author declares that there is no conflict of interest.

REFERENCES

[1] Abrahams, I. (2017). The nature of scientific thinking. Journal of Research in Science Teaching, 54(1), 5-25.

[2] Bleicher, R. E. (2017). Encouraging curiosity in science classrooms. Science Education International, 28(2), 142-155.

[3] Dewey, J. (1933). How we think: A restatement of the relation of reflective thinking to the educative process. D.C. Heath and Company.

[4] Harlen, W. (2015). Working with big ideas of science education. Science Education Programme of the International Council for Science (ICSU).

[5] Kind, P. M., & Kind, V. (2017). Creativity in science education: Perspectives and challenges. In A. Dias & M. J. Melo (Eds.), Creativity in the classroom: Perspectives and challenges (pp. 141-156).

[6] Lederman, N. G., & Lederman, J. S. (2014). Is the nature of science going, going, going, gone? Journal of Science Teacher Education, 25(2), 235-245.

[7] Osborne, J., & Dillon, J. (2008). Science education in Europe: Critical reflections. Nuffield Foundation.

[8] Renninger, K. A., & Hidi, S. (2016). The power of interest for motivation and engagement. Routledge.

GRT JOURNAL OF EDUCATION, SCIENCE AND TECHNOLOGY