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The Influence of Scientific Attitude on Academic Achievement among Secondary School Students

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Abstract:
This dissertation explores the relationship between scientific attitude and academic achievement among secondary school students. Scientific attitude encompasses curiosity, critical thinking and an appreciation for evidence-based reasoning. The study employs both quantitively and qualitative methods to investigate how students' attitudes towards science impact their academic performance across various subject's. By examining factors such as classroom environment, teaching methodologies, this research aims to provide insights of fostering a positive scientific attitude to enhance academic success.

Introduction:
In today's rapidly evolving world, the importance of fostering a scientific attitude among students cannot be overstated. A scientific attitude encompasses curiosity, critical thinking, open-mindedness, and a willingness to question and explore. It is not merely about memorizing facts but rather about developing a mindset that embraces inquiry and evidence-based reasoning.
Academic achievement is a multifaceted concept that goes beyond grades or test scores; it encompasses the development of cognitive skills, problem-solving abilities, and a deep understanding of subject matter. While various factors contribute to academic success, the role of a scientific attitude in shaping students' learning outcomes has gained increasing attention in educational research.
This study aims to investigate the relationship between scientific attitude and academic achievement among secondary school students. By examining how students' attitudes towards science influence their performance in academic settings, we can gain valuable insights into effective teaching and learning strategies.
Several theoretical frameworks underpin the importance of scientific attitude in academic achievement. Social cognitive theory, for instance, emphasizes the role of self-efficacy and motivation in learning outcomes. Students who possess a positive attitude towards science are more likely to believe in their ability to succeed and thus engage more actively in learning activities.
Furthermore, the constructivist perspective highlights the importance of active engagement and reflection in the learning process. A scientific attitude encourages students to question, experiment, and make sense of the world around them, leading to deeper conceptual understanding and enhanced academic performance.
Previous research has provided evidence of a positive correlation between scientific attitude and academic achievement across various educational contexts. However, the extent to which this relationship holds true among secondary school students, particularly in the context of diverse cultural and socio-economic backgrounds, warrants further investigation.

Understanding the influence of scientific attitude on academic achievement has practical implications for educators, policymakers, and curriculum developers. By promoting a culture of inquiry and fostering students' curiosity and critical thinking skills, schools can better prepare students for success in both academic and real-world settings.

In conclusion, this study seeks to contribute to the existing body of knowledge on the relationship between scientific attitude and academic achievement among secondary school students. By illuminating the factors that influence students' learning outcomes, we can work towards creating more effective educational practices that empower students to thrive in an increasingly complex and dynamic world.

Literature Review: The Influence of Scientific Attitude on Academic Achievement Among Secondary School Students

The relationship between scientific attitude and academic achievement has been a topic of interest in educational research for decades. Numerous studies have explored how students' attitudes towards science impact their learning outcomes, particularly in secondary school settings. This literature review synthesizes key findings from existing research to elucidate the influence of scientific attitude on academic achievement among secondary school students.

1. Definition and Components of Scientific Attitude: Scientific attitude encompasses a range of cognitive, affective, and behavioral attributes that contribute to effective scientific inquiry and learning. These include curiosity, skepticism, open-mindedness, critical thinking, and a willingness to engage in systematic inquiry and experimentation.
2. Theoretical Frameworks: Theoretical perspectives such as social cognitive theory and constructivism provide a foundation for understanding the relationship between scientific attitude and academic achievement. Social cognitive theory emphasizes the role of self-efficacy and motivation in learning outcomes, suggesting that students with a positive attitude towards science are more likely to believe in their ability to succeed and thus engage more actively in learning activities. Constructivism highlights the importance of active engagement and reflection in the learning process, suggesting that a scientific attitude promotes deeper conceptual understanding and enhanced academic performance.
3. Empirical Evidence: Numerous empirical studies have provided evidence of a positive correlation between scientific attitude and academic achievement among secondary school students. For example, research by Smith et al. (2017) found that students with higher levels of scientific curiosity and openness to new ideas demonstrated better performance in science subjects. Similarly, a study by Chen and Klahr (2019) revealed that students who exhibited greater skepticism and critical thinking skills achieved higher scores on science assessments.
4. Mediating Factors: Several mediating factors may influence the relationship between scientific attitude and academic achievement. These include teacher practices, classroom environment, parental support, and socio-economic status. For instance, research suggests that supportive teaching practices that promote inquiry-based learning and encourage students to ask questions and explore concepts independently can enhance students' scientific attitude and academic achievement.
5. Implications for Practice: Understanding the influence of scientific attitude on academic achievement has important implications for educational practice. Educators can promote a positive scientific attitude by integrating inquiry-based pedagogical approaches, fostering a culture of curiosity and critical thinking, and providing opportunities for hands-on experimentation and discovery. Moreover, curriculum developers and policymakers can design curricula that prioritize

the development of scientific skills and attitudes, ensuring that all students have the opportunity to excel in science education.

In conclusion, the literature reviewed underscores the significant impact of scientific attitude on academic achievement among secondary school students. By cultivating a positive scientific attitude and providing supportive learning environments, educators can empower students to become proficient in scientific inquiry and achieve success in their academic pursuits. However, further research is needed to explore the complex interplay between scientific attitude, socio-cultural factors, and academic achievement,

Method

Participants: Participants were 150 undergraduate students in two CBSE schools . total 150 students. 75 students girls and 75 boys students.

Materials

Scientific attitude scale is used. The SAS used in the present study has been entrusted by Harveen Kaur and Dr. Franky. Academic achievement score is the annual performance of students in science subject. Which is collected from the two schools.

Producer

The test provides a consumable booklet having question with a space for putting marks as their answer. The test can be scored by giving 5 marks for strongly agree, 4 for agree, 3 for undecided, 2 for strongly disagree for positive statements. In negative statements scores would be 1 for strongly agree, 2 for agree, 3for undecided, 4 for strongly disagree.

Data analysis

Scientific attitude scores were analyzed using mean, standard deviation and t test. Pearson 'r' correlation coefficient has been used to study the linear relation between two variables. A significance level of $p<0.05$ was used for all statistical tests.

Result

The result revealed a statistically significant difference in scientific attitude score (M=85.9, SD=9.3) and the academic achievement scores (M= 73.4, SD=8.3) t (120), $p<0.001$, r=0.34 and significant at 0.01 level. Thus the study revealed that there is positive correlation between scientific attitude and academic achievement of secondary school students.

Discussion

The findings of this study offer valuable insights into the relationship between scientific attitude and academic achievement among secondary school students. This discussion section provides a critical analysis of the study's findings, their implications, limitations, and suggestions for future research.

Conclusion

This dissertation contributes to our understanding of the influence of scientific attitude on academic achievement among secondary school students by synthesizing existing research, exploring theoretical frameworks, and employing diverse research methods. By highlighting the significance of fostering a culture of curiosity, critical thinking, and scientific inquiry in educational settings, this study provides

valuable insights for educators, policymakers, and curriculum developers seeking to enhance student learning outcomes and prepare the next generation of scientifically literate citizens. Ultimately, the promotion of a positive scientific attitude holds promise for empowering students to thrive academically and succeed in an increasingly complex and dynamic world.

References

1. Smith, J., Johnson, L., & Brown, T. (2017). Exploring the Relationship Between Scientific Curiosity and Academic Achievement in Science: Evidence from a Large-Scale Assessment. *Journal of Research in Science Teaching, 54*(4), 419-436.
2. Chen, X., & Klahr, D. (2019). The Role of Skepticism in Promoting Scientific Reasoning. *Journal of Educational Psychology, 111*(3), 465-479.
3. Bandura, A. (1986). Social Foundations of Thought and Action: A Social Cognitive Theory. Prentice-Hall.
4. Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. Harvard University Press.
5. Osborne, J., & Collins, S. (2001). Pupils' Views of the Role and Value of the Science Curriculum: A Focus-Group Study. *International Journal of Science Education, 23*(5), 441-467.
6. Trust, T., Krutka, D. G., & Carpenter, J. P. (2016). "Together we are better": Professional Learning Networks for Teachers. *Computers & Education, 102*, 15-34.
7. National Research Council. (2012). A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. National Academies Press.
8. Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher Efficacy: Capturing an Elusive Construct. *Teaching and Teacher Education, 17*(7), 783-805.
9. Patton, M. Q. (2014). Qualitative Research & Evaluation Methods: Integrating Theory and Practice. SAGE Publications.
10. Creswell, J. W., & Creswell, J. D. (2017). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publications.