

A Comprehensive Review of Scientific Interest in Relation to Study Habits among Secondary School Students

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Abstract

Scientific interest and study habits are two important factors that affect the academic achievement of students especially in science education. Scientific interest promotes curiosity, motivation and engagement in learning, while effective study habits lead to systematic learning, time management and academic performance. The objective of this review is to synthesize the current theoretical and empirical literature in an effort to analyze the relationship between scientific interest and study habits in secondary school students. The objective of this review is to understand the concepts of scientific interest and study habits, review the previous research findings, establish the relationship between the two variables, and highlight the existing research gaps. The study is based on qualitative review methodology based on published books, peer reviewed journal articles, research dissertations, conference papers and reports related to scientific interest, study habits, motivation and science education. A critical review and thematic analysis of literature relevant to the period 2006-2025 was undertaken. The review demonstrates that scientific interest has a positive impact on students' motivation, self-regulated learning, classroom engagement and academic performance. Good study habits also greatly increase the efficiency of learning, self-confidence and scientific achievement. The analysis shows that while there are a lot of studies done individually on both the variables, there are few studies done on their direct relationship, especially in the Indian context on secondary school students. The findings of the review suggest that the development of scientific interest together with proper study habits is essential in enhancing science learning outcomes and call for empirical studies in this area.

Keywords: *Scientific Interest, Study Habits, Secondary School Students, Science Education, Academic Achievement, Motivation.*

Introduction

Science is one of the most influential fields in modern society. Science and technology are developing rapidly and have profoundly affected every aspect of human life. The possession of scientific literacy by citizens is of great significance for the performance of social responsibilities and realization of sustainable social development. Schools are the main sites for the development of students' scientific reasoning, curiosity, creativity, and problem-solving skills. Hence the stimulation of interest in science should be made a primary aim of secondary education. In this study, science interest was defined as a person's tendency to find science education interesting and important, find the subject intellectually stimulating, and therefore actively participate in science learning. Students who express a very high degree of interest in science are more likely to engage in a broad array of science activities and are also more likely to enter science careers.

This paper argues that there are two basic factors affecting students' academic success, namely, scientific interest and learning habits. Learning habits are the behavioral patterns and strategies that students use to prepare for exams, complete assignments, read textbooks, take notes, review course content, and manage study time. Good study habits can assist learners in comprehending knowledge, long-term memory of knowledge, improve the efficiency of time use, and train their ability to learn

independently. It is a common view among academics that cognitive ability alone cannot account for differences in students' academic performance; affective and behavioural factors interact to influence academic performance. Interest is what makes students want to dig into learning material, but good habits are what organize their education. Many countries have implemented the reforms of education that focus on learners, research and experiential learning, which emphasize the importance of the development of these two basic elements. The aim of the present study is to review the literature on scientific interest and study habits of secondary school students. It provides a thorough insight into theoretical models, empirical evidence, research gaps and practical implications for teachers and researchers.

Concept of Scientific Interest

General interest, as a psychological construct, refers to an individual's preference for specific activities and academic disciplines; educational psychology categorizes it as a motivational variable that can direct attention, sustain effort, and boost learning engagement. The science interest this study focuses on refers to students' preference for science-related activities and concepts, encompassing all forms of enthusiasm for scientific inquiry. The Four-Phase Model of Interest Development, proposed by scholars Hidi and Renninger (2006) states that interest develops from triggered situational interest into mature individual interest, and teachers can promote this process through enlightening learning experiences.

Scientific interest possesses several dimensions:

- Curiosity toward scientific phenomena.
- Enjoyment in conducting scientific experiments.
- Desire to acquire scientific knowledge.
- Participation in science-related activities.
- Preference for science subjects.
- Aspiration toward science-related careers.

This study identifies eight core categories of factors that influence individuals' interest in science, covering multi-dimensional conditions including classroom climate, parental encouragement, and laboratory resources, among others. Students with high levels of science interest can attain four core developmental advantages.

Concept of Study Habits

Study habits refer to the consistent learning methods and behavioral practices adopted by learners, covering multiple core behaviors including planning and concentration. Educational psychologists define them as learnable, effectiveness-boosting behavioral patterns that help students improve their learning outcomes and reduce academic stress.

Major components of study habits include:

Major components of study habits are time management, reading abilities, note taking, revision, focus, learning environment, self-evaluation and examination preparation. Good time management helps students divide the time properly to different studies and prevents procrastination. Good reading skills assist learners to grasp issues instead than memorizing them. Good reading skills improve understanding. Taking notes enables you to structure important information for future revision. Repeating the content helps to consolidate it in your mind and to build on what you already know. Concentration It helps Students to Concentrate and not get distracted during studying. Learning is also more successful in a serene, structured and comfortable learning environment. Through self-evaluation, students can identify their strengths and weaknesses, monitor their academic progress and take corrective activities accordingly. Finally, preparation for systematic examination decreases worry and increases confidence. Students are well-prepared for their exams. These components are together responsible for successful learning, greater academic accomplishment and development of self-regulated learning habits in secondary school learners.

Research has revealed that youngsters with good study habits tend to have higher academic achievement, better memory, more confidence, less anxiety and stronger self-regulated learning skills. In contrast, poor study habits can result in procrastination, anxiety, ineffective learning and poor academic performance. Study habits do not come by heritage, they are taught by teaching, practice and experience. Parents and teachers can be of great help in helping children develop productive study habits.

Purpose of the Study

Science education is important for developing scientific literacy, critical thinking and problem solving skills of students in secondary school. Scientific interest and study habits, as one of the various factors affecting science learning, have become important determinants of academic achievement. Students' scientific interest is the factor behind their active learning of science. Study habits, on the other hand, influence the effectiveness of organizing and regulating students' learning activities. Though these variables have been studied separately in many studies, not much research has been done on the interrelationship of these variables, especially for secondary school students in the Indian context. Therefore, the present review aims to integrate the existing literature, identify key findings, point out research gaps and suggest directions for future research on the association between scientific interest and study habits.

Objectives of the Study

The review was undertaken with the following aims:

1. To define the notion, and the structure of scientific interest of students of secondary school.
2. To understand the meaning and importance of study habits in secondary education.
3. To study the main empirical studies of scientific interest.
4. To examine major empirical researches on study habit.
5. To study the relationship between scientific interest and study habits of secondary school students.
6. To identify gaps in research and suggest future research directions.

Methodology

The present paper uses a qualitative review methodology. Literature was obtained from peer-reviewed journals, books, dissertations, conference proceedings, and reports related to scientific interest, study habits, science education, motivation, and self-regulated learning. Studies published between 2006 and 2025 were selected for their relevance to the objectives of the review. Twelve to 14 representative studies were critically reviewed and organized chronologically. The literature collected was analyzed thematically into five themes, which are (i) Scientific interest, (ii) Study habits, (iii) Relationship between scientific interest and study habits, (iv) International and Indian studies, and (v) Research gaps. The findings were integrated to identify common trends, similarities, differences and implications for future research.

Conceptual Framework

The conceptual framework of the present study assumes that scientific interest is a motivational variable that affects students' learning behaviour. Study habits are behavioural manifestations of learning motivation.

Independent Variable

- Scientific Interest

Dependent Variable

- Study Habits

This framework suggests that students with greater scientific interest are more likely to engage in disciplined study practices such as regular revision, effective time management, note-taking, self-evaluation, and active participation in science learning.

Review of Literature

The Four-Phase Model of Interest Development, proposed by Hidi and Renninger (2006), expressed that students' interest advances from situational interest to individual interest via meaningful learning experiences. They found that continuous scientific interest fosters independent learning and long-term involvement with science. Gambill, Moss and Vescogni (2008) investigated the effect of study skills on students' academic accomplishment. They discovered that good study habits such as note-taking, time management and consistent review greatly improved students' learning results. Olvido (2010) analyzed students of Philippine Science High School and found out that students with good study habits had more positive attitude towards biology and had higher academic achievement than students with poor study habits. The assessment of research on scientific interest by Krapp and Prenzel (2011) revealed that classroom setting, inquiry-based education and laboratory experiences are important for the development of students' scientific interest that in turn increases scientific literacy and lifetime learning. Shahidi et al. (2014) found that poor study skills learned in secondary education had a negative impact on subsequent academic achievement. They advocated systematic training in study methodologies and self-regulated learning for improving educational outcomes.

Lin-Siegler et al. (2016) discovered that teaching students about the challenges faced by prominent scientists dramatically enhanced their desire and enthusiasm in learning science, leading to increased persistence in academic tasks. Zhang and Tang (2017) examined extracurricular science activities of Chinese middle school students and found that participation in science clubs and practical investigations significantly increased students' scientific enthusiasm, classroom participation, and science achievement. Aris and Orcos (2019) studied the employment of educational robotics in secondary education and found that robots-based learning increased students' motivation, scientific curiosity, creativity and STEM skills. Chairani, Faslah, and Wahono (2024) stated that study habits had a significant effect on students' academic progress. Students who consistently reviewed courses, did their homework and managed their study time well, had greater learning results.

Recent STEM Education Reviews (2024–2025) found that inquiry-based learning, STEM education, digital simulations, and project-based learning are successful in increasing students' scientific curiosity, motivation, and active involvement in science learning.

International studies frequently show that children who have a greater interest in science are more motivated, have better study habits and achieve better academic success. Moreover, the authors highlight that inquiry-based and activity-based pedagogy are successful in promoting interest in science and self-regulated learning. Research in India has shown a link between good study habits and better science performance. Students who have more positive attitudes and curiosity for science are more likely to participate in active science learning. However, relatively few Indian research have directly investigated the association between scientific interest and study habits of secondary school pupils.

Analysis of the Reviewed Literature

All the evaluated research consistently provided evidence that scientific interest is a motivational factor that fosters active involvement, curiosity, persistence and self-regulated learning. Students with a greater interest in science are more likely to engage in laboratory activities, inquiry-based learning, and independent study of scientific concepts. Similarly, study habits are one of the strongest behavioral predictors of academic achievement in literature. Effective study habits (e.g., time management, regular

revision, note-making, active reading and self-evaluation) can improve the efficiency of learning and academic success.

The review also suggests a beneficial association between scientific interest and study habits. Students that are more interested in science tend to have more disciplined study habits, because an innate motive drive results in persistence in learning. Other reinforcing aspects include inquiry-based teaching, STEM activities, educational robotics and extra-curricular science courses that further foster scientific enthusiasm and productive study habits.

Though a lot of study has been done in worldwide context on these variables, there are comparatively fewer studies in Indian context to see their direct association. Most of the Indian investigations have focused on the science achievement and study habits or scientific mindset separately. Hence, there is a need for additional empirical research on the relationship between scientific interest and study habits of secondary school pupils.

Research Gap

The review indicates that there are very few studies that have explored the direct association between scientific interest and study habits of secondary school pupils. Previous research has tended to consider these characteristics either in isolation or in connection to academic achievement. There is little information on the effect of gender, locality, kind of school, socio-economic status and parental education on this link. Moreover, the role of recent educational reforms, digital learning and STEM-based instructional approaches on scientific interest and study habits needs further examination notably in the Indian educational system

Educational Implications

The findings of the studied literature have numerous key implications for educational practice.

For Educators: Teachers need to adopt inquiry-based, activity-oriented and learner-centred instructional strategies to arouse curiosity and maintain scientific interest. The science learning can be made more interesting and enjoyable via laboratory experiments, demonstrations, field excursions, project work, scientific fairs and joint research. Teachers must teach study skills explicitly: time management, note-making, concept mapping, revision methods and self-assessment tools.

For School Administration: Schools could also modernize laboratories, host science clubs, exhibitions, tournaments and create opportunities for involvement in STEM activities. Guidance and counselling services are expected to be a means of helping learners to develop healthy study habits and positive attitudes towards science.

For Curriculum Developers: Science courses should contain hands-on activities, problem-solving exercises, real-world applications and interdisciplinary learning opportunities that encourage curiosity and self-directed learning. The information has to be relevant to students' everyday life to be able to sustain students' interest in the long term.

For the Parents: Parents should develop a helpful home atmosphere for scientific interest through the use of books, educational media, discussion and constructive supervision of study habits. Positive parental involvement is very important in the creation of excellent study habits.

For Researcher: Future research should adopt longitudinal and mixed methods to capture the developing nature of science interest and its impacts on study practices, academic performance, job choices, and lifelong learning.

Suggestions for Future Research

Based on the review, the following recommendations are proposed:

1. The study should be conducted on huge scale investigations in diverse geographical areas and different educational systems.
2. Investigate the gender disparity in science enthusiasm and study habits.
3. Investigate the influence of digital learning environments on science interest.
4. Investigate the effect of parents' participation in developing scientific interest.
5. To determine the influence of inquiry based science teaching on study habits.
6. Examine the correlations between scientific interest, study habits, academic accomplishment and self-regulated learning.
7. Longitudinal studies are needed to explore developmental changes in adolescents' scientific interest.
8. Design intervention strategies that concurrently enhance enthusiasm in science and study habits.
9. Compare government students and private school students on these characteristics.
10. Use qualitative methodologies to understand students' perspectives of scientific learning and study behaviour.

Conclusion

Scientific interest and study habits are two closely related constructs which play an important role in the educational success of students. The literature suggests that students with high scientific interest tend to have higher motivation, curiosity, classroom engagement, persistence, and independent learning. These motivational characteristics naturally promote the development of effective study habits. Systematic study habits help students organize learning activities, manage time, remember knowledge and be successful in science. Good study habits might help you feel more confident and less anxious before tests. They can help you keep learning for life.

The interrelationship between scientific interest and study habits is explained in a unified manner by theoretical frameworks such as Self-Determination Theory, the Four-Phase Model of Interest Development, Social Cognitive Theory, Constructivist Learning Theory, and Self-Regulated Learning Theory. Students should be interested in what they are studying. Scientific curiosity can be a powerful motivator for students to engage in the learning process and disciplined study habits help translate that curiosity into measurable academic success. Although there has been a lot of research into each of these variables separately there is very little empirical research that has looked at the direct relationship between them among secondary school students and particularly in the Indian educational context. This discrepancy motivates future research in an interesting way.

Fostering scientific curiosity and the development of good study habits are complementary educational goals. Schools, teachers, parents, curriculum designers and legislators must work together to create interesting learning environments that stimulate curiosity and teach students the study skills they need to succeed in school. These efforts will improve scientific performance and will foster the development of scientifically literate, motivated and independent learners who are ready to meet the challenges of the twenty-first century.

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