2026 Volume: 02 Issue: 07 www.ijrpa.com ISSN 2456-9995 Research Article

International Journal Research Publication Analysis

Page: 01-19

SCIENCE PROCESS SKILLS AS MEDIATOR IN THE RELATIONSHIP BETWEEN SCIENTIFIC CURIOSITY AND CREATIVITY IN SECONDARY EDUCATION

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Article Received: 06 June 2026

Article Revised: 26 June 2026

Published on: 16 July 2026

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DOI: https://doi-doi.org/101555/ijrpa.8111

ABSTRACT

This study examines the role of science process skills in mediating the relationship between scientific curiosity and creativity in secondary school students. Curiosity frequently compels pupils to investigate novel concepts, whilst creativity enables them to produce innovative answers. Nonetheless, in the absence of essential process skills—such as observation, classification, measurement, inference, and prediction—curiosity may fail to yield innovative scientific results. A correlational study involving 200 children was conducted to investigate this association, utilizing standardized instruments for measuring curiosity, creativity, and process abilities. Mediation research indicated that science process skills significantly explained the relationship between curiosity and creativity. Students exhibiting superior process abilities were more adept at transforming their passion into innovative scientific endeavours. These findings underscore the necessity of incorporating process skills into educational methods, guaranteeing that scientific instruction fosters both inquiry-based learning and innovative problem-solving.

KEYWORDS: Scientific Creativity, Scientific Curiosity, Science Process Skills, and Mediation.

INTRODUCTION

In contemporary classrooms, fostering students' creative thinking and curiosity about science transcends just academic objectives; it is crucial for equipping them to tackle global concerns.

Creativity allows learners to redefine challenges and suggest innovative solutions, whereas curiosity compels them to inquire and pursue profound comprehension. Collectively, these attributes foster scientific reasoning and innovation (Kashdan & Silvia, 2009; Lucas & Spencer, 2017). Nevertheless, despite their acknowledged significance, the methods by which schools foster curiosity and creativity—and the interplay between the two remain insufficiently examined. A possible avenue resides in scientific process skills. Skills including observation, classification, measurement, inference, and prediction equip students with practical instruments for methodical inquiry into their questions. When students employ these skills, their initial interest is more likely to transform into innovative insights and effective problem-solving. It is essential to comprehend the relationship between these skills, curiosity, and creativity to enhance scientific instruction in secondary schools. The link between our natural curiosity about the world and the creativity that drives scientific discovery has emerged as a vital topic in the realm of science education. Curiosity shows how eager a learner is to dive into new questions, seek out answers, and push the boundaries of what we already know (Gottfried, 1990). Creativity allows students to take their curiosity and turn it into new viewpoints, unique solutions, or inventive ways to tackle scientific challenges (Runco & Jaeger, 2012). When we combine curiosity and creativity, we find that curiosity invites us to ask questions, and creativity empowers us to explore those questions with fresh perspectives. The evolution of curiosity into creativity often hinges on having strong science process skills in place. These involve activities like noticing trends, organizing information, assessing results, making conclusions, anticipating future scenarios, and communicating findings. These skills serve as a guiding structure, directing our innate curiosity towards thoughtful and organized exploration. For example, when a student comes across something unusual, their curiosity might spark the first observation. However, using process skills like careful measurement or thoughtful classification helps that observation grow into a creative explanation or experiment (Jirout & Zimmerman, 2015; Turiman et al., 2012). Even though they naturally connect with one another, curiosity, creativity, and process skills often go unexamined together in research conducted in schools. Many studies tend to focus on just one or two aspects, which raises the important question of how process skills influence the journey from curiosity to creativity (Lin & Tsai, 2013). This limited attention makes it challenging for teachers to create strategies that intentionally nurture curiosity and lead to meaningful creative thinking. This study aims to fill this gap by suggesting that science process skills play a key role in mediating factors. Instead of viewing curiosity and creativity as separate qualities, it investigates whether the skills involved in the process can connect curiosity-driven exploration to meaningful creative contributions in science. This method is especially important in secondary education, where students are not just expected to learn facts but also to show adaptability, problem-solving skills, and creative thinking—traits that are crucial for tackling the challenges of contemporary science courses and real-life situations.

SIGNIFICANCE OF THE STUDY

- This study is significant in many ways. At the academic level, it builds on the current literature by exploring curiosity, creativity, and process skills not as separate elements but as interconnected factors that influence scientific learning. There have been only a handful of investigations that look at them together, and this approach sheds light on how process skills can connect a student's initial interest with their ability to solve problems creatively.
- The findings can really help teachers and curriculum designers in their work. When we understand that curiosity by itself might not spark creativity without the support of process skills, educators can create lessons that thoughtfully blend questioning with organized exploration. This approach helps students stay engaged and turn their curiosity into unique contributions.
- This study opens up new avenues for future research. Looking into process skills as a mediator allows us to consider other possible avenues—like motivation, critical thinking, or teamwork—that could link curiosity with creativity. By recognizing these mediators, researchers can gain a deeper insight into the way scientific thinking evolves in young learners.
- The study highlights the importance of science education that fosters curiosity and also develops the skills needed to turn that curiosity into creative results. This approach offers valuable ideas and real-world strategies to help learners become critical and innovative thinkers, ready to navigate a constantly evolving world.

LITERATURE REVIEW

In the past decade, educators in the field of science have increasingly focused on the ways in which curiosity and creativity enhance students' learning journeys. These qualities are often seen as essential for enhancing our understanding and improving our ability to tackle challenges. Curiosity inspires learners to ask questions and delve into the unknown, while creativity empowers them to develop fresh viewpoints and craft inventive solutions. When brought together, these qualities can enhance students' ability to think critically and tackle complex scientific challenges from various perspectives. Even with this acknowledgment, the ways in which curiosity connects to creativity in classroom environments are still not fully grasped. A lot of the current research has looked at these two concepts separately, usually highlighting their individual advantages instead of exploring how they work together. The possible connection between science process skills and the relationship between curiosity and creativity hasn't been explored much. It's crucial to tackle this gap, as process skills can shed light on how a student's initial curiosity transforms into innovative scientific results. This research brings together previous research on three important concepts—scientific curiosity, scientific creativity, and science process skills. The text explores each person's unique contributions, looks into how they relate to one another, and points out the gaps that make this investigation necessary.

1. Scientific Curiosity

A genuine sense of wonder drives a learner to continuously ask questions, dig into exploration, and seek to understand the mysteries of the natural world. Instead of just being something they passively think about, it acts as a motivating force that encourages students to look for explanations, try out ideas, and actively connect with scientific concepts. When curiosity is alive, learners tend to stay focused, embrace challenges, and put in the effort to solve problems. Studies consistently show how valuable curiosity is for learning in science education. Engelhard and Schmitt (2016) found that students with a strong sense of curiosity were more likely to stick with challenging problems, often motivating themselves to dive deeper into their inquiries. In a similar vein, Jirout and Klahr (2012) discovered that curiosity has a positive connection to achievement in science. This indicates that curiosity not only sparks initial interest but also fosters a more profound engagement with the material and the skills involved. Even though curiosity is widely acknowledged as important, it has frequently been examined on its own, resulting in lingering questions about how it connects with other concepts. The connection between creativity and science is still not fully understood. Exploring whether curiosity just ignites interest or actually leads to creative results needs more research, particularly in the realm of secondary education.

2. Science Process Skills

Science process skills are the abilities that help learners tackle scientific problems in a thoughtful and evidence-driven way. These skills are more than just memorization; they embody the practical and cognitive approaches that enable inquiry to flourish. Classic frameworks, like Padilla’s (1986), highlight observation, classification, measurement, inference, prediction, and experimentation as the essential components of scientific inquiry. When used well, these skills turn curiosity into a thoughtful exploration, allowing students to gather information, identify patterns, and arrive at well-supported conclusions.

Developing process skills has always been highlighted as a key aspect of science education. Students who develop these skills are not just more equipped to carry out experiments; they also become more adept at understanding data, thinking logically, and recognizing the links between scientific concepts. Bybee (2015) and Harlen (2013) suggest that when students master process skills, they become more prepared to engage in real inquiry and enhance their involvement in significant scientific endeavors. Moreover, the skills involved in processes are deeply connected to creativity in the field of science. Jensen and Lawson (2011) pointed out that when learners take the time to observe, make inferences, and experiment, they tend to come up with more original solutions and show a greater ability to think flexibly. In this way, science process skills play two important roles: they help us grasp scientific concepts accurately and also equip us with the means for imaginative exploration.

3. Scientific Creativity

Scientific creativity refers to the ability to come up with ideas, explanations, or solutions that are fresh and meaningful in a scientific setting. It’s not just about coming up with new ideas; it’s also about using what you know in surprising ways, creating fresh solutions to challenges, and looking at well-known information from new angles (Hu & Adey, 2002; Sternberg, 2006). In this way, creativity embodies the imaginative aspect of scientific exploration, enabling students to go beyond the conventional limits of thinking. More and more, experts are highlighting the importance of fostering creativity to equip students for real-world scientific and societal issues. Cropley (2015) suggested that nurturing creativity in education helps learners not just to manage current knowledge but also to play a role in its development. In a similar vein, a study by Kind and Kind (2007) found that students who possessed strong creative abilities were more inclined to suggest unique solutions, create original projects, and maintain their motivation while tackling problem-solving tasks. Just like curiosity, creativity doesn't develop on its own. It often relies on a blend of skills like logical reasoning, critical thinking, and a thoughtful approach to using scientific methods. When these elements come together, students are more likely to harness their curiosity into creative results that matter both in real life and in theory.

4. The Relationship between Scientific Curiosity and Scientific Creativity

Studies in education and psychology frequently highlight curiosity as a vital foundation for fostering creative thinking. Curiosity sparks exploration, inspires learners to ask new questions, and nudges them to think about unfamiliar possibilities—all of which can create a strong base for creative insight (Guilford, 1967; Kashdan & Steger, 2007). In this way, curiosity serves as the spark that ignites the initial phase of coming up with ideas. Research in science education highlights this connection while also revealing its intricate nature. Lin and Tsai (2013) found that students who showed greater curiosity tended to engage more in creative ways of scientific reasoning. Karwowski and colleagues (2016) suggested that curiosity encourages the risk-taking and adaptable thinking essential for approaching scientific challenges in innovative ways. These findings indicate that while curiosity can open doors to creativity, it doesn't automatically lead to creative results by itself. Numerous scholars emphasize that curiosity needs the backing of other skills—like critical reasoning, existing knowledge, and scientific process skills—to truly foster authentic creativity. Without these supports, curiosity might spark exploration, but it doesn't always guarantee innovation. This viewpoint emphasizes the importance of looking at mediators, like process skills, to truly grasp how curiosity can evolve into innovative scientific endeavors.

5. Science Process Skills: Connecting Curiosity to Creativity

The skills involved in the scientific process are essential in transforming curiosity into creativity. A student's initial curiosity can ignite their interest, but without structured methods like observing, experimenting, and reasoning, that interest might not develop fully. Process skills serve as the framework that guides curiosity into focused exploration, opening doors to imaginative results. A learner who finds themselves fascinated by a natural phenomenon might start with basic observations. However, with thoughtful measurement or experimentation, that initial curiosity can evolve into a fresh explanation or solution. Previous research has highlighted this important role in the process. Zimmerman (2000) highlighted that process skills play a crucial role in transforming curiosity into impactful creative endeavors. Harlen and Qualter (2004, 2013) noted that students who possess stronger process skills tend to tackle problems with greater flexibility and create investigations that lead to innovative outcomes. Kind and Kind (2007) connected mature process skills with increased engagement in creative problem-solving, indicating that these competencies enhance understanding and expand the possibilities for imaginative exploration. Even with these insights, there is still a lack of empirical evidence regarding how process skills mediate the relationship between curiosity and creativity, especially in secondary education. This gap highlights the importance of dedicated research, as grasping this mechanism can assist educators in shaping classroom practices that not only foster curiosity but also empower students to transform their questions into unique contributions.

RESEARCH QUESTIONS

- How much does a sense of wonder about science help students show their creative side in science during secondary school?
- Can science process skills play a role in connecting curiosity and creativity in the context of learning science?
- How do particular process skills, like observation, inference, or experimentation, influence the connection between curiosity and creativity?
- In what ways could improving students' process skills boost their curiosity-driven inquiry and creative problem-solving in science classrooms?

METHODOLOGY

This study used a quantitative research approach with a correlational design to explore how science process skills mediate the relationship between scientific curiosity and scientific creativity in secondary school students. We found that a correlational framework made sense for our study since our main aim was to explore the natural connections between the variables rather than to change them. This design aimed to explore how curiosity directly impacts creativity, as well as how it might indirectly affect creativity through various process skills. The selected approach offers a clear framework for examining the suggested mediation model, all while ensuring that students' real classroom experiences are respected and preserved.

1. Research Design

The study utilized a correlational research design, which effectively explores the natural relationships between variables without the need for experimental manipulation. This approach was chosen because the research questions aim to explore if scientific curiosity can predict creativity and if science process skills play a role as a mediating factor in this connection. The study utilized a correlational framework to explore how the three constructs relate to one another, examining both the strength and direction of these relationships while also testing the proposed mediation model through statistical methods. This design made it possible to gather data from students in their everyday school settings, ensuring that the findings truly represent real learning situations instead of being based on artificial, controlled environments.

2. Participants

The study involves a sample of secondary school students (grades 8th and 9th) from a selection of schools. A total of 200 students, aged between 13 and 15, will be selected through random sampling.

3. Instruments

Three standardized instruments were employed to assess the principal variables: scientific curiosity, scientific creativity, and science process abilities.

- **Scientific Curiosity Inventory**
- **Scientific Creativity Test**
- **Science Process Skills Test**

Each instrument has been chosen for its validity and reliability in assessing the relevant constructs.

4. Procedure

The data collection process was carried out in phases

1. **Data Collection**:

The Scientific Curiosity Inventory was given to gauge students' interest in scientific phenomena. Next, students engage in the Scientific Creativity Test, tackling creative problem-solving tasks. The Science Process Skills Test was administered as the final step to evaluate students' abilities in observation, classification, measurement, inference, and experimentation. This measure provided insight into how well learners could apply practical inquiry skills, which were expected to influence the relationship between curiosity and creativity. The data collection took place over two days during our usual class hours, ensuring that everything ran smoothly and without too many interruptions. Every session runs for about 90 minutes.

Ethical Considerations: Parental consent and student assent were obtained before participation. Students' anonymity and confidentiality were maintained throughout the research. Participation is voluntary.

DATA ANALYSIS

To test the mediating effect of science process skills, the following statistical analyses were performed:

1. **Mediation Analysis**:

The four-step model for mediation proposed by Baron and Kenny in 1986 was utilized to explore if science process skills play a mediating role in the connection between scientific curiosity and creativity. This approach includes:

- Step 1: Testing the direct effect of scientific curiosity on scientific creativity.
- Step 2: Testing the effect of scientific curiosity on science process skills.
- Step 3: Testing the effect of science process skills on scientific creativity.
- Step 4: Testing whether the relationship between scientific curiosity and scientific creativity is reduced when controlling for science process skills (partial mediation) or (strong mediation).

- **Statistical Software**: Data analysis was conducted using SPSS for structural equation modeling (SEM), allowing for a more nuanced analysis of the mediation pathways.

H_{01}: The science process skills do not play a significant role in mediating the relationship between the scientific curiosity and scientific creativity of secondary school students.

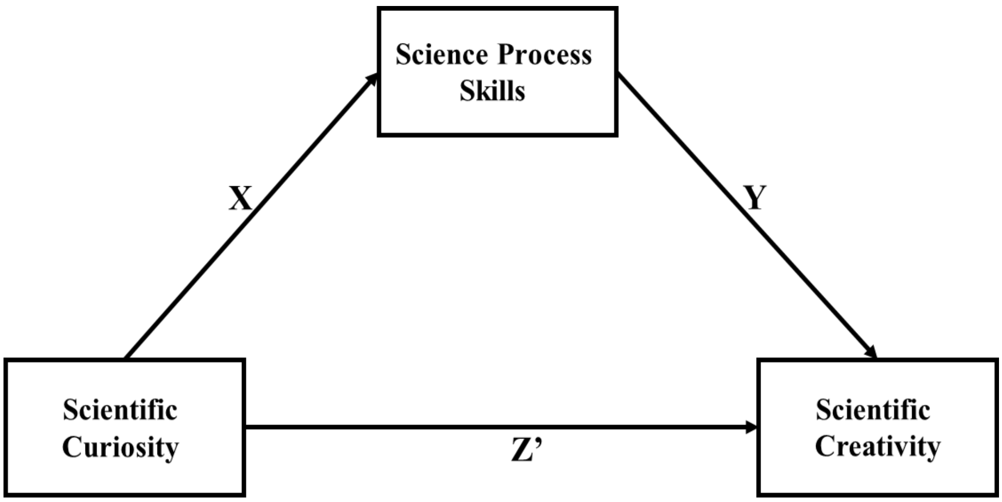

Fig. 1. Mediating effect of science process skills.

The values of direct effect, indirect effect, and total effect are essential to calculate the mediation effect of science process skills in the relationship between the scientific curiosity and scientific creativity of secondary school students (fig. 1). Here, the direct effect (Z') is the direct relationship between scientific curiosity and scientific creativity in the presence of the science process skills.

The indirect effect is the relationship that flows from scientific curiosity to science process skills and then to scientific creativity (**X*Y**).

Fig. 2. shows the total effect is the combined influence of the direct effect between two constructs and the indirect effect flowing through the mediator (**Z = Z' + X*Y**).

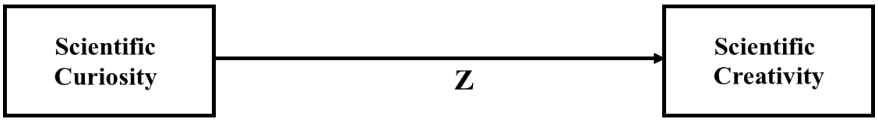

Fig. 2. Total effect.

RESULTS

This study sheds light on how science process skills play a key role in connecting scientific curiosity and creativity in secondary school students. The results are shared through mediation analysis.

Mediation Analysis

To explore the idea that science process skills play a role in connecting scientific curiosity with scientific creativity, we used Baron & Kenny's four-step method for mediation analysis from 1986. Here's what we found at each step:

Step 1: The Impact of Scientific Curiosity on Scientific Creativity

A regression analysis was carried out to explore if scientific curiosity has a direct influence on scientific creativity. The findings indicate that a genuine interest in science greatly enhances creative thinking in the field.

Step 2: How Scientific Curiosity Influences Science Process Skills

The next step was to explore if a sense of scientific curiosity can predict skills in scientific processes. The findings show that having a genuine interest in science greatly enhances one's ability to engage in scientific processes.

Step 3: How Science Process Skills Influence Scientific Creativity

The third step explored how science process skills influence scientific creativity. The findings indicate that skills in scientific processes play a crucial role in fostering creativity in science.

Step 4: Exploring Mediation Effects

In the end, we explored the complete mediation model by looking at whether the link between scientific curiosity and scientific creativity diminishes when we factor in science process skills as a mediator. Integrating science process skills into the model enhanced the impact of scientific curiosity on creativity.

The study explored how the science process skills of secondary school students play a role in connecting scientific curiosity with scientific creativity. The findings showed a notable indirect effect ($\beta = 1.4976$, $p < 0.05$) linking scientific curiosity to scientific creativity (Table 1 and Table 2). Additionally, the direct impact of scientific curiosity on scientific creativity, when considering the mediator, was shown to be negligible ($\beta = 0.0366$, $p > 0.05$). Table 3 presents the summary of the mediating analysis created using SPSS software. This suggests that science process skills play a crucial role in connecting scientific curiosity with scientific creativity.

Table 1: Mediation Estimates.

Effect	Estimate	SE	Z	P
Indirect	1.497	0.326	4.596	<0.001*
Direct	0.0366	0.250	0.146	0.884
Total	1.4610	0.395	3.699	< 0.001*

** Significant at the 0.05 level*

Table 2: Path Estimates.

	Estimate	SE	Z	P
scientific curiosity → science process skills	0.8011	0.169	4.74	<0.001*
science process skills → scientific creativity	1.8696	0.099	18.86	<0.001*
scientific curiosity → scientific creativity	0.0366	0.250	0.15	0.884

** Significant at the 0.05 level*

Table 3: Mediating Analysis Summary.

Relationship	**Total Effect**	**Direct Effect**	**Indirect Effect**	**Percentage of Mediation**	**Remark**
SCu - > SPS - > SCr	1.5342	0.0366	1.4976*	97%	Perfect Mediation

**Significant at the 0.05 level*

**Scientific Curiosity (SCu)*

**Science Process Skills (SPS)*

**Scientific Curiosity (SCr)*

SUMMARY OF MEDIATION FINDINGS

The mediation analysis shows that science process skills play a crucial role in connecting scientific curiosity with scientific creativity. Students who show a greater sense of curiosity tend to build stronger science process skills, which helps them think more creatively in scientific situations. Yet, the wonder of science directly influences creativity, regardless of the skills involved in the process. The details regarding Objective and Hypothesis Testing (H01) can be found in Table 4.

- A genuine interest in science plays a crucial role in fostering creativity in the field.
- Scientific curiosity plays a crucial role in shaping science process skills.
- Science process skills play a crucial role in fostering scientific creativity.
- Science process skills play a crucial role in connecting curiosity and creativity, while curiosity itself also directly influences creativity.

Table 4: Summarisation of Hypothesis Testing. (H_{01})

Objective	Hypothesis	Remark
The aim is to explore how the science process skills of secondary school students influence the connection between their scientific curiosity and creativity in science.	H01: The science process skills do not play a significant role in mediating the relationship between the scientific curiosity and scientific creativity of secondary school students.	Perfect Mediation (97%) Sig.
The reason behind the result: Science process skills play a vital role in connecting scientific curiosity with creativity, offering students a clear path to explore their ideas. Students are naturally curious, eager to ask questions and explore new ideas. Science process skills help them turn these inquiries into organized investigations. By using science process skills, students can transform their curiosity into meaningful creative scientific endeavors, where they can experiment, hypothesize, and innovate. In essence, science process skills act as the bridge between curiosity and creativity by supporting practical exploration, improving critical thinking, and being systematic. problem-solving. This moderating effect enables students to go beyond being curious. of science to creative thinkers who are capable of bringing innovative solutions and new ideas. insights to the scientific world.		

DISCUSSION

The report of this research contains useful information on the connection between scientific. curiosity, scientific creativity, and the mediating role of science process skills among secondary school students. In this section, the implications of the results are discussed, and the findings are compared with. present studies, and identifies possible contributions to science teaching. The study's Limitations and recommendations are also given on future research.

1. The connection between scientific curiosity and scientific creativity

The results show a meaningful and positive link between scientific curiosity and scientific creativity. This highlights that curiosity is our natural desire to explore, ask questions, and uncover new knowledge. It fosters students' ability to think creatively and generate innovative ideas in science. These findings align with earlier research conducted by Karwowski, Jankowska, and others in 2016, as well as Lin and Tsai in 2013. Both seem to suggest that curiosity plays a crucial role in fostering creativity and thought. This finding suggests that educators should work to foster curiosity in science classrooms.

2. Science Process Skills as a Mediator

This study aimed to investigate how science process skills might influence the connection between scientific curiosity and creativity. The mediation analysis showed that science process skills play a crucial role in mediating this relationship. Students' curiosity plays a vital role in developing their process skills—like observation, classification, measurement, communication, inference, and prediction. These skills, in turn, help them think creatively in scientific situations.

This finding is consistent with earlier research that emphasizes how crucial science process skills are for scientific inquiry and problem-solving (Bybee, 2015; Harlen, 2013b). Science process skills offer a way for students to harness their curiosity, transforming it into imaginative scientific results. The null hypothesis stated that secondary school students' science process skills do not significantly mediate the relationship between their scientific curiosity and scientific creativity. The analysis shows that we cannot accept the null hypothesis, indicating that secondary school students play a significant role in mediating the impact of science process skills on the relationship between scientific curiosity and scientific creativity. The findings align with the research carried out by Qiang et al. (2020), Wang et al. (2023), Xiang et al. (2024), Yaşar et al. (2022), and Y. Ma (2023). They similarly found that the science process skills of secondary school students play a significant mediating role in the connection between scientific curiosity and scientific creativity. Nonetheless, this finding stands in contrast to the research carried out by Y. Ma (2023), Nursiwan & Hanri (2023), Ramdani et al. (2022), Tasgin & Dilek (2023), Wang et al. (2023), and Xiang et al. (2024), who discovered that the science process skills of secondary school students did not play a significant mediating role in the connection between scientific curiosity and scientific creativity.

IMPLICATIONS FOR SCIENCE EDUCATION

The findings of this study have several important implications for science education:

- **Curriculum Design**: Science curricula should emphasize both the development of curiosity and process skills. Integrating activities that foster inquiry, exploration, and experimentation will help students channel their curiosity into creative scientific thinking.
- **Teaching Practices**: Teachers should adopt instructional strategies that encourage curiosity-driven learning and the development of process skills. This can be achieved through project-based learning, inquiry-based activities, and hands-on experiments that allow students to engage with scientific concepts creatively.
- **Implication to the science education is as follows:** process skills development is essential to building not only scientific literacy, but also creativity in students.

LIMITATIONS OF THE STUDY

However, there are certain limitations of this study that should be admitted:

- **Cross-Sectional Design:** The research employed the cross-sectional design of research and as such, this design cannot be used to draw any cause and effect conclusion among the variables. Stronger evidence would be available in longitudinal research on the development of curiosity, process skills, and creativity over time.
- **Generalizability:** The research was carried out on a sample of secondary school students in a definite area. The results are not likely to be applicable to students in other learning environments or age brackets. Future studies may re-treat the study with other populations to increase the generalizability.

RECOMMENDATIONS FOR FUTURE RESEARCH

To expand on the results of this study, further studies may be conducted on the following areas:

- **Longitudinal Studies:** To better understand the interaction and influence of curiosity, process skills, and creativity on each other at various stages of education, it would be advantageous to conduct longitudinal research to trace the changes in each of these variables over time.

- **Experimental Studies:** Experimental research that manipulates process skill teaching may provide more convincing evidence concerning the mediating role of process skills in facilitating creativity. These studies may be comparative in nature and may be used to assess various instructional strategies and their effects on curiosity and creativity.
- **And further Mediators may be explored:** Future studies may investigate other possible mediators (such as motivation, cognitive flexibility or problem-solving strategies), which could also contribute to the conversion of curiosity into creativity in scientific settings.
- Future studies might consider other potential mediators or moderators that can affect the relationship between curiosity and creativity to gain a better understanding of how the two variables interact in science education.

CONCLUSION

This research highlights how important science process skills are in fostering a genuine interest in scientific creativity and innovation. While curiosity sparks students' desire to explore and engage with scientific phenomena, it is the process skills that enable them to transform that curiosity into innovative outcomes. The findings suggest that when teaching science, educators should focus more on fostering students' process skills, which can help spark their curiosity and creativity.

This study explores how science process skills act as a bridge between scientific curiosity and creativity among secondary school students. This study explores how curiosity, creativity, and process skills connect in the journey of learning science. The research design is a correlational study, involving a sample of 200 students aged 13 to 15 years, which focuses on measuring key variables. The findings indicate a notable indirect relationship between scientific curiosity and scientific creativity, along with a direct influence of scientific curiosity on scientific creativity when a mediator is involved. The study shows that science process skills play a crucial role in connecting scientific curiosity with scientific creativity. Curious students tend to build stronger science process skills, which helps them think more creatively in scientific situations. Yet, the wonder of science can significantly influence creativity, regardless of the skills involved in the process. The mediation analysis shows that having a genuine interest in science plays an important role in boosting scientific creativity, while the skills involved in the scientific process are essential for nurturing both curiosity and creativity in this field.

Statements and Declarations

Declaration on the role of generative AI and AI-assisted technologies in the writing journey: While working on this project, the author(s) relied on Grammarly to help refine the language. Once this tool/service was utilized, the author(s) took the time to review and edit the content as necessary, assuming full responsibility for the publication's content.

CRediT statements: **Amita Joshi:** Conceptualization, Data curation, Writing- Original draft preparation. **Prof. Sambit Kumar Padhi:** Supervision, Conceptualization, Data curation, Writing- Reviewing. **Dr. Subrat Kumar Padhi:** Conceptualization, Writing- Reviewing.

Aditi Joshi: writing-original draft

Competing Interests:

None

Funding:

No funding was received.

Acknowledgments

Authors are thankful to Guru Ghasidas Vishwavidyalaya, Bilaspur, for granting permission to publish it.

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