GURU : Genius Journal of Education
An International Peer-Reviewed Journal
Published by Genius Publishing
https://geniusjournal.net/
geniuspublichealth@gmail.com

E-ISSN: xxxx-xxxx (Online)
Volume 1, Issue 1, 2026, pp. 1–8
https://doi.org/___

ORIGINAL ARTICLE

Integrating Scientific Pedagogy and Teacher Creativity: Their Impact on Student Motivation in Junior High School Learning Environments

Zainul Arifin[1], Asia Anis Sulalah[2]

[1]Sekolah Tinggi Ilmu Tarbiyah Togo Ambarsari, Bondowoso, Indonesia
[2]Sekolah Tinggi Ilmu Tarbiyah Togo Ambarsari, Bondowoso, Indonesia

ARTICLE INFORMATION

Article history:
Received: 2026-01-29
Revised : 2026-02-20
Accepted: 2026-03-29

Keywords:

Scientific approach;
Teacher creativity;
Learning motivation;
Junior high school students

Corresponding Author:
Zainul Arifin
Sekolah Tinggi Ilmu Tarbiyah Togo Ambarsari, Bondowoso, Indonesia
Email:
zainul.arifin88@gmail.com

ABSTRACT

Introduction: Student learning motivation plays a crucial role in determining the effectiveness of the educational process, particularly in secondary school settings. However, many classroom practices still lack active student engagement due to limited instructional variation. The adoption of a scientific approach and the enhancement of teacher creativity are considered essential strategies to create interactive and meaningful learning experiences.

Objectives: This study aimed to examine the effect of the implementation of a scientific approach and teacher creativity on students' learning motivation, both individually and simultaneously.

Methods: A quantitative correlational design was employed in this study. The participants consisted of 169 eighth-grade students from a public junior high school. Data were collected using a structured questionnaire and analyzed using descriptive statistics and multiple linear regression to determine the partial and combined influence of the independent variables on students' learning motivation.

Results: The findings indicate that the implementation of a scientific approach has a positive and significant effect on students' learning motivation, contributing approximately 24.2%. Teacher creativity also shows a positive influence, with a contribution of 11.1%. Furthermore, the simultaneous test demonstrates that both variables significantly affect learning motivation ($F = 21.218$; $p < 0.001$), indicating that the integration of structured teaching approaches and creative instructional practices plays an important role in enhancing student motivation.

Conclusions: The study concludes that both the scientific approach and teacher creativity significantly influence students' learning motivation, either independently or in combination. These findings suggest that optimizing instructional strategies through systematic and innovative teaching practices is essential to promote a more engaging and motivating learning environment in secondary education.

A. Introduction

Education plays a crucial role in developing human capital and preparing individuals to meet the demands of the 21st century, particularly in terms of critical thinking, collaboration, and problem-solving skills. In secondary education, the effectiveness of the learning process is not only determined by curriculum design but also by how instructional practices are implemented in the classroom. Despite continuous reforms, many classroom practices remain teacher-centered, limiting students' opportunities to actively construct knowledge and reducing their motivation to learn (OECD, 2019; World Bank, 2020). This situation highlights the need for more interactive and student-centered instructional approaches that can foster meaningful learning experiences.

Learning motivation is widely acknowledged as a key factor influencing students' academic engagement and achievement. From the perspective of self-determination theory, motivation is shaped by the fulfillment of students' needs for autonomy, competence, and relatedness (Ryan & Deci, 2020). Students with higher levels of motivation tend to demonstrate greater persistence, engagement, and academic success, whereas low motivation is often associated with passive participation and reduced learning outcomes (Schunk & DiBenedetto, 2020). In addition, the development of students' interest plays a significant role in sustaining motivation over time, as described in the four-phase model of interest development (Hidi & Renninger, 2016). Moreover, self-regulated learning has been identified as an important factor in maintaining students' motivation and improving academic performance (Zimmerman, 2015).

One instructional approach that has received considerable attention in recent years is the scientific approach, which emphasizes active student involvement through processes such as observing, questioning, experimenting, analyzing, and communicating. This approach is grounded in constructivist learning theory, which views learners as active participants in the construction of knowledge (Bybee, 2015). Empirical evidence suggests that inquiry-based or scientific approaches can enhance students' engagement, critical thinking skills, and learning outcomes (Furtak et al., 2016; Lazonder & Harmsen, 2016). However, existing studies tend to focus primarily on cognitive outcomes, with relatively limited attention given to affective aspects such as learning motivation, particularly in the context of social science education at the junior high school level.

In addition to instructional approaches, teacher-related factors play a significant role in shaping students' learning experiences. Teacher creativity, defined as the ability to design innovative, flexible, and engaging instructional strategies, has been increasingly recognized as a key component of effective teaching (Beghetto & Kaufman, 2014). Creative teachers are able to create dynamic classroom environments that stimulate curiosity and encourage active participation. Previous studies have shown that teacher creativity is positively associated with student engagement and motivation (Bereczki & Kárpáti, 2021; Davies et al., 2019). Furthermore, the integration of creativity and technology in teaching practices has been reported to enhance students' engagement and learning effectiveness in contemporary classrooms (Henriksen et al., 2018).

Although prior research has demonstrated the individual contributions of scientific approaches and teacher creativity to learning processes, these variables are often examined separately, resulting in a fragmented understanding of their roles in influencing students' learning motivation. There is still limited empirical evidence that simultaneously investigates the combined effects of these variables within a unified quantitative framework, particularly in developing country contexts where variations in teaching practices may influence instructional effectiveness (World Bank, 2020). This indicates that the interaction between structured

instructional approaches and teacher creativity in shaping students' motivation remains underexplored.

Therefore, this study aims to analyze the effect of the implementation of the scientific approach and teacher creativity on students' learning motivation, both partially and simultaneously. The findings of this study are expected to contribute to the development of more effective, innovative, and student-centered instructional practices that can enhance students' motivation and engagement in secondary education.

B. Methods

This study employed a quantitative approach using a correlational research design to examine the relationships between the implementation of the scientific approach, teacher creativity, and students' learning motivation. The correlational design was considered appropriate as it allows the researcher to identify both the individual and combined effects of the independent variables on the dependent variable without manipulating the natural classroom setting.

The participants in this study consisted of 169 eighth-grade students from a public junior high school. A total sampling technique was applied, in which all members of the population were included as research participants. This approach was selected to ensure that the data accurately represented the entire population, given its manageable size.

The study involved two independent variables and one dependent variable. The independent variables were the scientific approach and teacher creativity, while the dependent variable was students' learning motivation. The scientific approach refers to the implementation of student-centered learning processes, including observing, questioning, experimenting, associating, and communicating. Teacher creativity refers to the teacher's ability to design and implement innovative, flexible, and engaging instructional strategies. Meanwhile, learning motivation refers to students' internal and external drive to participate in and sustain learning activities.

Data were collected using a structured questionnaire designed based on relevant theoretical indicators. The instrument employed a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire items were developed to measure each variable in accordance with the research objectives, ensuring content relevance and clarity.

The data collection process was conducted by distributing the questionnaires directly to the participants during school hours. Prior to data collection, the respondents were informed about the purpose of the study and assured that their responses would remain confidential. The researcher supervised the administration of the questionnaires to ensure that all items were completed accurately.

Data analysis was carried out using both descriptive and inferential statistical techniques. Descriptive statistics were used to summarize the data, while multiple linear regression analysis was applied to examine the relationships between variables. The regression model was used to determine the extent to which the scientific approach and teacher creativity influenced students' learning motivation, both partially and simultaneously. The significance of the relationships was tested using t-tests for partial effects and an F-test for the simultaneous effect, with a significance level set at 0.05.

Ethical considerations were carefully addressed throughout the study. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. Additionally, all data were treated confidentially and used solely for academic research purposes.

C. Results

The results of this study are presented based on the analysis of the relationships between the scientific approach, teacher creativity, and students' learning motivation using multiple linear regression. The analysis was conducted to determine both the partial and simultaneous effects of the independent variables on the dependent variable.

Descriptive analysis indicated that the overall level of students' learning motivation was within the moderate to high category. Similarly, the implementation of the scientific approach and the level of teacher creativity were perceived positively by the students, suggesting that both variables were adequately applied in the learning process.

Further analysis using multiple linear regression revealed that the scientific approach had a positive and statistically significant effect on students' learning motivation. The contribution of this variable to learning motivation was approximately 24.2%, indicating that the more effectively the scientific approach is implemented, the higher the students' motivation to learn.

In addition, teacher creativity also demonstrated a positive influence on students' learning motivation, with a contribution of 11.1%. Although the effect size was smaller compared to the scientific approach, the result remained statistically significant, suggesting that creative teaching practices play an important role in enhancing students' motivation.

The simultaneous effect of the scientific approach and teacher creativity on students' learning motivation was also examined using the F-test. The analysis showed that the combined effect of both independent variables was statistically significant ($F = 21.218$; $p < 0.001$), indicating that the integration of structured instructional strategies and creative teaching practices contributes meaningfully to improving students' learning motivation.

Table 1. Summary of Regression Analysis Results

Variable	Contribution (%)	Significance
Scientific Approach (X1)	24.2%	Significant
Teacher Creativity (X2)	11.1%	Significant
Simultaneous Effect	—	$F = 21.218$ ($p < 0.001$)

Overall, the findings indicate that both the scientific approach and teacher creativity have significant effects on students' learning motivation, both individually and collectively. Among the two variables, the scientific approach showed a stronger contribution, suggesting that structured, student-centered instructional processes play a more dominant role in influencing motivation. However, the role of teacher creativity remains essential in supporting and enhancing the effectiveness of the learning process.

D. Discussion

The findings of this study demonstrate that both the scientific approach and teacher creativity have significant positive effects on students' learning motivation, both individually and simultaneously. These results reinforce the argument that effective instructional strategies and teacher-related factors are essential in fostering students' engagement and motivation in the learning process.

The significant influence of the scientific approach on students' learning motivation indicates that student-centered instructional practices play a crucial role in enhancing learners' active participation. The scientific approach, which emphasizes inquiry-based processes such as observing, questioning, and experimenting, enables students to become actively involved in

constructing knowledge. This active engagement contributes to increased motivation, as students feel more responsible for their own learning. This finding is consistent with previous studies that highlight the effectiveness of inquiry-based learning in improving students' motivation and engagement (Kang & Keinonen, 2018; Kiemer et al., 2015). Furthermore, inquiry-oriented instruction has been shown to promote deeper understanding and intrinsic motivation by encouraging students to explore and reflect on learning content (Pedaste et al., 2015).

However, the contribution of the scientific approach, while substantial, also suggests that instructional strategies alone may not fully explain variations in students' motivation. This highlights the importance of complementary factors, particularly teacher-related variables. In this study, teacher creativity was found to have a positive and significant effect on students' learning motivation, although its contribution was smaller compared to the scientific approach. This finding suggests that while structured pedagogical approaches provide a foundation for learning, the way teachers implement these approaches creatively can further enhance their effectiveness.

Teacher creativity plays a critical role in shaping a supportive and engaging classroom environment. Creative teachers are more likely to design diverse learning activities, use varied instructional media, and adapt teaching strategies to students' needs, thereby increasing students' interest and participation. Previous research supports this finding, indicating that creative teaching practices contribute to higher levels of student engagement and motivation (Jeffrey & Craft, 2019; Rubenstein et al., 2018). In addition, creative instruction has been linked to improved classroom climate, which fosters students' emotional involvement in learning (Soh, 2017). This implies that teacher creativity functions as a catalyst that enhances the effectiveness of instructional approaches.

The simultaneous effect of the scientific approach and teacher creativity further emphasizes the importance of integrating structured and flexible teaching practices. The findings suggest that the combination of systematic instructional design and creative implementation creates a more meaningful learning experience for students. This integration allows teachers to not only deliver content effectively but also to engage students emotionally and cognitively. Similar findings have been reported in previous studies, which indicate that the interaction between teaching strategies and teacher characteristics significantly influences student motivation (Skaalvik & Skaalvik, 2018; Collie et al., 2016).

Despite these positive findings, the relatively lower contribution of teacher creativity compared to the scientific approach suggests that its impact may depend on contextual factors such as teaching experience, classroom environment, and institutional support. Previous research indicates that teachers may face challenges in implementing creative teaching practices due to constraints such as limited resources, time pressure, and rigid curriculum requirements (Harris & de Bruin, 2018). Therefore, enhancing teacher creativity requires not only individual effort but also institutional support in the form of professional development and flexible curriculum policies.

Furthermore, this study contributes to the existing literature by providing empirical evidence on the combined effects of instructional approaches and teacher creativity on students' learning motivation, particularly in the context of junior high school education. While previous studies have often examined these variables separately, the present findings highlight the importance of understanding their interaction within a unified framework. This integrated perspective is essential for developing more effective teaching practices that address both cognitive and affective aspects of learning.

Overall, the findings of this study suggest that improving students' learning motivation requires a balanced approach that combines structured instructional strategies with creative teaching practices. Educators are encouraged to adopt the scientific approach while simultaneously

enhancing their creativity in designing and delivering instruction. By doing so, teachers can create a more engaging and motivating learning environment that supports students' academic and personal development.

E. Conclusion

This study concludes that both the implementation of the scientific approach and teacher creativity have significant positive effects on students' learning motivation, both partially and simultaneously. The scientific approach demonstrates a stronger contribution, indicating that structured, student-centered instructional processes play a dominant role in enhancing students' motivation. Meanwhile, teacher creativity also contributes meaningfully by supporting the effectiveness of instructional delivery and creating a more engaging learning environment.

Furthermore, the simultaneous influence of these two variables confirms that the integration of systematic teaching strategies and creative instructional practices is essential in fostering students' motivation. These findings highlight that improving learning motivation requires not only well-designed pedagogical approaches but also the active role of teachers in delivering instruction creatively and adaptively. Therefore, the combination of the scientific approach and teacher creativity can serve as an effective framework for promoting more meaningful and motivating learning experiences in secondary education.

F. Recommendations

Based on the findings of this study, several recommendations are proposed. First, teachers are encouraged to consistently implement the scientific approach in classroom instruction while simultaneously enhancing their creativity in designing learning activities. This combination is essential to create a more interactive, engaging, and student-centered learning environment that can improve students' motivation.

Second, schools and educational institutions should provide continuous professional development programs aimed at improving teachers' pedagogical competence and creativity. Training programs focusing on innovative teaching strategies, instructional media development, and student-centered learning methods are necessary to support teachers in implementing effective learning practices.

Third, policymakers are advised to support the integration of flexible and innovative teaching approaches within the curriculum. Providing adequate resources, infrastructure, and institutional support can help teachers apply creative and inquiry-based learning more effectively.

Finally, future researchers are recommended to explore additional variables that may influence students' learning motivation, such as learning environment, teaching experience, and the use of educational technology. Further studies using different research designs and broader populations are also needed to enrich the understanding of factors affecting students' motivation in various educational contexts.

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