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Teacher creativity and innovation influence the quality of learning, which impacts learning achievement in physical education

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ABSTRACT

Physical education in schools contributes to students' physical and mental health. To produce learning achievement in this subject, teachers must design unique and effective methods. This research aims to determine the role of teacher creativity and innovation in influencing the quality of learning which has an impact on learning achievement at MTs in Cikijing District, Majalengka Regency. The research design was quantitative, using an explanatory survey of 92 teachers in four sub-districts using a questionnaire instrument. Data analysis was carried out descriptively and verifiably through path analysis. Research findings show that teacher creativity, which encourages new learning methods, synergizes with teacher innovation, opens the door to more effective teaching approaches, and the improved quality of learning positively impacts student achievement. The implications of this research include developing training programs and adapting educational policies to support teachers in implementing innovation and creativity, providing practical guidance for educators and policies to improve the quality of learning and student achievement.

Keywords:

Innovation,
Teacher creativity,
Physical education,
Quality of learning,
Learning achievement

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Introduction

Physical education at the school level has significant urgency in forming student integrality. Children's physical and mental health correlates with their academic abilities and social development. According to research by [Maldari et al. \(2023\)](#), school Physical education programs can help improve students' physical health, strengthen social skills, and stimulate their cognitive development. In other words, physical education interventions not only contribute to physical health but also have a positive impact on children's academic performance and social aspects. In addition, research by [Wintle \(2022\)](#) highlights that physical education in schools can form a healthy lifestyle from an early age. Students can understand the importance of a healthy lifestyle through structured physical activities, including a good diet and regular exercise habits. The role of teachers in realizing this ideal target is very much needed.

Teacher creativity and innovation in the context of physical education are the main pillars of improving student learning achievement because they create a dynamic and inspiring learning environment ([Xing & Qi, 2023](#)). According to [Hasanovna \(2023\)](#), teacher creativity creates informative learning experiences that spark student interest and curiosity. In Physical and Health learning, creative approaches can stimulate students' active participation in physical activities, provide variety in teaching methods, and motivate them to make physical activity a healthy lifestyle. Therefore, teacher creativity not only facilitates understanding of Physical and Health learning concepts but also

provides a foundation for applying health principles in students' daily lives (Ardiansyah & Setiawan, 2023). Meanwhile, teacher innovation in Physical and Health learning, as expressed by Vasilopoulos et al. (2023), opens up opportunities for more effective and relevant teaching approaches. Innovation can involve using modern technology, developing up-to-date learning programs, or integrating mental health elements in the Physical and Health learning curriculum. By implementing innovation, teachers can adapt learning to student needs, create challenges that stimulate development, and connect Physical Education concepts with the real world. The combination of teacher creativity and innovation must also be supported by a quality learning process so that it is in sync with student learning achievement targets (Jamshid, 2023).

Maintaining and improving the quality of learning in physical education is a necessity that we cannot ignore. Blömeke et al. (2022) state that the quality of learning reflects the effectiveness of teaching, which directly impacts student understanding and participation. In physical education, learning quality includes the teacher's ability to create learning experiences that are engaging and relevant and can encourage the development of physical skills and understanding of health concepts (Shang et al., 2023). Maintaining the quality of learning is critical to providing meaningful and in-depth learning experiences. Maintaining the quality of learning in Physical Education is also related to its impact on student welfare. According to Luo et al. (2022), quality learning can help develop students' intrinsic motivation towards physical activity, contributing to a healthy lifestyle. Good quality learning creates an environment that supports the development of all students, leaving no one behind. Therefore, maintaining the quality of learning in Physical Education ensures a good understanding of concepts and physical skills and contributes to the development of students as healthy, active individuals and participants in society.

Measuring student learning achievement in physical education is essential because it provides an objective evaluative basis for the effectiveness of teaching and learning in this field. According to Sugianto et al. (2023), measuring learning achievement offers an in-depth understanding of how students have achieved the set learning goals. In physical education, measurements include academic aspects, achievements in physical skills, and knowledge of health concepts. By mapping learning achievement, teachers can assess how students can apply Physical Education concepts in everyday life and develop the necessary physical skills. Measurement of physical education learning achievement also provides essential information for continuous improvement in teaching methods and curriculum. According to Mulyawati et al. (2022), learning achievement data helps teachers identify areas of student weakness and strength so that learning plans more appropriate to individual needs can be prepared. Evaluation focusing on learning achievement also contributes to developing a more effective and relevant Physical Education program in line with the development of requirements and demands in society (Kilag et al., 2023).

In the context of physical education learning in the Majalengka District, especially in the Panyingkiran, Kadipaten, and Kertajati areas, it was found that conventional learning methods were the main obstacle to increasing student enthusiasm and involvement. Research observations show that the use of traditional methods in teaching Physical Education by teachers in this area has had a negative impact on student motivation, resulting in a lack of active involvement in the learning process. Previous studies by Rokhayati et al. (2017) and Mesnan et al. (2023) have also highlighted the incompatibility of conventional methods with the characteristics of subjects in physical education. Limited sources of knowledge in teachers and textbooks add obstacles to the learning process, so students do not have an active role in improving their understanding and Physical Education skills. Temporarily, Dyson (2014) emphasizes the importance of focusing on the quality of practical learning methods in physical education subjects. The situation in the Majalengka District shows that conventional methods, which are still dominant, have had a negative impact on the optimal development of students' abilities.

This is reflected in the low learning achievement of Physical Education students in elementary schools throughout Majalengka Regency, with the average score in the final semester exam below the set standards. Specifically, a score of 71 for the southern part of Majalengka and 70 for the

northern part clearly shows that the quality of physical education learning needs to be improved significantly. Regarding research by [Gil-Arias et al.\(2017\)](#) and [Mesnan et al.\(2023\)](#), teacher creativity in using media is a critical aspect that needs to be measured and improved in the context of Physical Education learning. This is because student motivation is directly influenced by the learning methods used. Therefore, the main problem is increasing the effectiveness of Physical Education learning in the Majalengka District by developing more innovative learning methods oriented towards active student involvement, primarily through increasing teacher creativity in utilizing learning media.

Although previous research by [Rokhayati et al. \(2017\)](#), [Mesnan et al. \(2023\)](#), and [Dyson \(2014\)](#) has highlighted the problems of using conventional methods in Physical Education learning; there are still several shortcomings and gaps that need to be investigated further. One of the significant gaps is the lack of emphasis on teacher creativity and innovation in utilizing learning media, designing unique learning methods, and demonstrating skills in using teaching aids, which are critical factors in increasing student motivation. This research explores the role of teacher creativity and innovation in improving the quality of learning and learning achievement. This research will contribute by detailing and further exploring the role of teacher creativity and learning media in increasing student motivation and involvement in Physical Education learning in Majalengka District. By studying it locally, it is hoped that this research can provide new insights and practical solutions that teachers in the area can implement. In addition, this research will provide a more specific database to support the development of more contextual and effective Physical Education learning strategies at the local level, with the potential for a positive impact on improving student achievement.

Methods

The research design was quantitative, using an explanatory survey. The research population included Physical Education Teachers in four sub-districts, with a sampling technique using cluster proportional random to obtain a sample of 92 people. The data collection method was carried out by field studies through observation techniques and distributing questionnaires developed by [Boroujerdi & Hasani \(2014\)](#) with an ordinal scale of 1-4 through identification as follows (Table 1).

Table 1. Questionnaire Indicators

Variable	Indicator	Description	Reliability value
Teacher creativity	New learning media	Teachers utilize new learning media, including the latest technology and resources, to increase teaching effectiveness.	0.736
	Ability to use new learning media	Teachers can effectively use various new learning media, provide innovative learning experiences, and combine technology with teaching materials to support student understanding.	
Teacher innovation	Mastery of sports practice aids	Teachers demonstrate expertise in mastering sports practice aids, ensuring effective use to improve student's skills and understanding.	0.765
	New learning methods	Teachers are adopting new learning methods, creating innovative approaches to delivering material, and providing students with more dynamic and relevant learning experiences.	
	Selection of innovative teaching materials	Teachers ensure that learning materials are relevant and exciting for students, thereby improving the quality of learning.	

Variable	Indicator	Description	Reliability value
Quality of learning	Curriculum support	Teachers provide support for the curriculum by integrating learning material into the context of the school curriculum, ensuring a close link to educational goals.	0.751
	The role of the teacher	Teachers are essential in guiding and inspiring students, creating a learning environment that supports their optimal development.	
	Learning process	Teachers ensure an effective learning process with good management, creating a dynamic learning experience and supporting student progress according to the established curriculum.	
Students' achievements	Development of physical fitness	Students can improve and maintain their level of physical fitness through active participation in sports and physical activities. The evaluation may include cardiovascular health, endurance, and body strength.	0.740
	Development of moral character	Students can improve moral character development, including ethical values, attitudes, and positive behavior. The focus involves sportsmanship, honesty, discipline, and responsibility, which are essential in forming students' personalities.	
	Basic movement abilities and skills	Students can reach basic movement abilities and skills. This result includes coordination, agility, and speed in various physical activities and sports—the evaluation through direct observation of students' abilities in carrying out basic movements.	

The researcher conducts data analysis descriptively to describe the condition of the variables and verification to analyze the causal relationship between variables. Data was collected through questionnaires from a population sample to understand and identify the observed variables. Data is analyzed descriptively to describe the conditions of creativity, innovation, quality of learning, and physical education learning outcomes. Next, in a verifiable manner, path analysis is used to determine the influence of variables on other variables. Initially, ordinal data was processed into interval data using the successive interval method, allowing for more in-depth analysis.

Results and Discussion

From the analysis of respondent characteristics in Table 2, we concluded that the 92 Physical Education teachers who participated in this research had diverse profiles, creating a representative and comprehensive picture of the research participants.

Based on the Table 2 most respondents were in the 41-50 year age range. This dominance shows that their experience and expertise can significantly contribute to this research. According to several studies, teachers with more extended work experience understand effective learning strategies better and can face challenges better (Ismayilova & Bolander Laksov, 2023). This experience can create a strong foundation of knowledge and enable teachers to integrate innovative approaches to learning (Vidergor, 2023). In addition, the dominance of respondents in specific age ranges to generational characteristics in the educational context. According to generational theory, each age group has unique features, values, and preferences that can influence their approach to teaching and learning (Nugroho et al., 2023). In this context, the 41-50-year age group may show maturity in combining traditional experiences with modern approaches to sports learning.

Table 2. Characteristics of Research Respondents

Characteristics	Distribution	
	F	%
Age (years)		
< 30	3	3.26
30 – 40	31	33.70
41 – 50	44	47.83
> 50	14	15.22
Gender		
Male	54	58.70
Female	38	41.30
Education Level		
Senior High School	13	14.13
Diploma	24	26.09
Bachelor	49	53.26
Magister	6	6.52
Length of work (years)		
< 5	11	11.96
5-15	25	27.17
16 – 25	37	40.22
>26	19	20.65
Total	92	100.00

In terms of gender, the majority of respondents were men, reaching 58.70%. Although the researcher found the respondent gender differences, the relatively balanced distribution provided a reasonably good representation of the perspectives of men and women in this study. This condition aligns with previous research, emphasizing the importance of balanced gender involvement and representation in physical education (Mortejo, 2023). The physical education literature argues that gender diversity in the teaching workforce can benefit students because each gender can uniquely contribute to learning (Flores-Aguilar et al., 2023). Female and male teachers can bring different experiences and perspectives to the classroom, creating an inclusive learning environment and supporting holistic student development (Hancock, 2023). Gender diversity in the teaching workforce can also be a positive role model for students, eliminating gender stereotypes in career choices and interests. Previous studies show that positive interactions with teachers of both genders can motivate students to pursue their interests without being influenced by traditional gender norms (Heinz et al., 2023). Although this relatively balanced distribution provides representational advantages, it remains important to explore in more depth how these gender differences might influence classroom dynamics and interactions between teachers and students in physical education and sports contexts.

The characteristics of respondents in terms of education show that most have a bachelor's educational background, reaching 53.26%. This condition reflects the high level of education among research participants, and this can be linked to excellence in understanding and responding to learning challenges with a certain level of complexity. Guaman-Quintanilla et al. (2023) research supports the idea that higher education can improve teachers' abilities to analyze and solve educational problems better. Most respondents with work experience between 16-25 years indicate that this research can utilize the expertise and insight that physical education teachers have gained. This work period creates a solid foundation for analyzing and interpreting data in a study. Teachers with relatively long tenure tend to have a deep understanding of the dynamics of sports learning, effective teaching strategies, as well as the challenges and changes that occur in the educational context (Wang & Klassen, 2023). Extended work experience can provide insight into changing trends, student needs, and developments in the physical education curriculum (Backman et al., 2023). Teachers who have been in the profession for a long time may be able to identify changes and understand how best to adapt, improve, or develop their teaching practices (Barker et al., 2023). In addition, the participation of teachers with significant work experience can provide a practical and

contextual dimension to research results. They can provide a deeper understanding of policy implementation, challenges in the field, and practical solutions to improving the quality of sports learning (Fletcher & Hordvik, 2023).

Table 3. Characteristics of research respondents

Variable	Less		Enough		Good		Total	
	F	%	F	%	F	%	F	%
Teacher creativity	15	16.30	42	45.65	35	38.04		
Teacher innovation	19	20.65	51	55.43	22	23.91	92	100.00
Quality of learning	10	10.87	46	50.00	36	39.13		
Physical education learning achievement	1	1.09	45	48.91	46	50.00		

Table 3 evaluates respondents' characteristics related to teacher creativity, innovation, learning quality, and physical education learning achievement. Overall, teacher creativity, innovation and learning quality are pretty good. This result follows the comprehensive reflection of the educational characteristics and experience of Physical Education teachers in the research. Teachers with adequate qualifications tend to understand creative teaching methods better, implement innovation, and improve learning quality (Toding et al., 2023). Meanwhile, the excellent category dominates physical education learning achievement and tends to be adequate. This condition shows the contribution of physical education teacher qualifications in building an effective learning environment and improving physical education learning achievement. This representation follows previous research showing a positive relationship between physical education teacher qualifications and the quality of learning and student achievement (MacPhail et al., 2023).

Furthermore, we verified the interaction between variables in this study through a path analysis test with the results shown in the following picture:

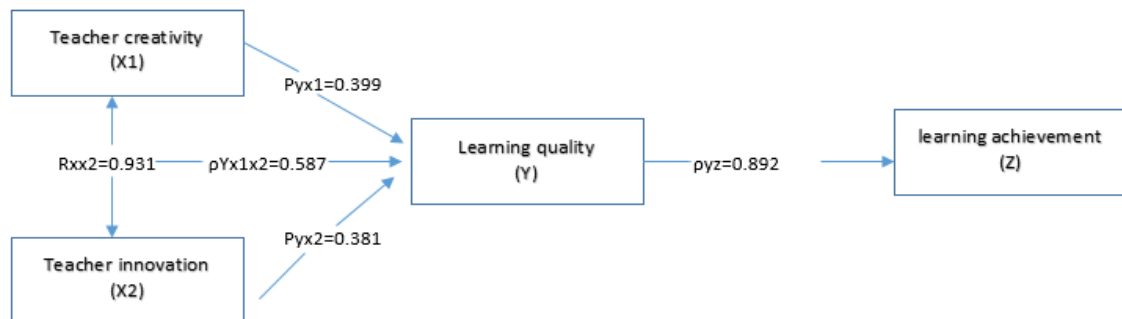


Figure 1. A Path Analysis Test with The Results

Based on the results above, we found that teacher creativity contributes 15.920% directly and 14.152% indirectly to the quality of learning through teacher innovation, resulting in a total contribution of 30.072%. Meanwhile, teacher innovation contributed 14.516% directly and 14.152% indirectly to the quality of learning through teacher creativity, resulting in a total contribution of 28.668%. These findings provide an overview of the importance of teacher creativity and innovation as determining factors of learning quality in this research. An overview of partial and simultaneous influence measurements in this path analysis is in the following Table 4:

The results of testing the structural model in Table 4 show significant findings in the context of the influence of teacher creativity (X1) and teacher innovation (X2) on the quality of learning (Y), as well as their impact on student's physical education learning achievement (Z). The positive significant path coefficients between teacher creativity and learning quality and between teacher innovation and learning quality indicate that increasing teacher creativity and innovation contributes positively to improving the quality of learning in physical education and sports.

Table 4. Results of structural model testing

Structural Model	Statistical value				
	Path coefficient	Coefisient R	Coefficient t	Coefficient F	Sig
$X_1 \rightarrow Y$	0,399		3.388		0.001
$X_2 \rightarrow Y$	0.381		3.232		0.000
$X_1, X_2 \rightarrow Y$		0.587		159.418	0.000
$Y \rightarrow Z$	0.892		29.569		0.000

These findings align with previous research that highlights the critical role of teacher creativity and innovation in improving the quality of learning (Toyirovna, 2023). Teacher creativity is identified as a key factor motivating the development of new learning methods, increasing the attractiveness of learning materials, and creating a stimulative learning environment (Kholisoh et al., 2023). In addition, teacher innovation in applying new methods and approaches to learning can provide the variety needed to stimulate student interest and involvement (Rais & Rubini, 2022).

The importance of teacher creativity and innovation in improving the quality of learning is also strengthened by constructivism theory, which emphasizes active and interactive learning and involves the application of knowledge in authentic contexts (Barak, 2017). Teacher creativity in creating unique learning experiences can support students' knowledge construction, while teacher innovation can provide new ways to facilitate student-centered learning processes (Agarwal, 2018). Then, the finding that the quality of learning positively influences students' physical education learning achievement is in line with previous research, which confirms the positive relationship between learning quality and student learning achievement in physical education and sports (Dyson, 2014). High-quality learning can increase students' motivation and understanding of concepts and skills in the physical education context, contributing to increased learning achievement (Iserbyt et al., 2017). While this study highlights the importance of teacher creativity and innovation in improving the quality of learning, it should be noted that limitations may arise in the generalizability of the findings, mainly if the focus of the study is limited to the physical education context. In addition, the research methods used and the characteristics of the participants and sample may affect the internal and external validity of the results. Therefore, future research should be conducted with consideration of these limitations.

Overall, the results of this study make an essential contribution to our understanding of the factors that influence the quality of learning and learning achievement in physical education and sport. The implications of this research can be the basis for developing innovative learning strategies and increasing teacher creativity to improve the quality of learning and achieve optimal learning achievement in the context of student physical education.

Conclusion

This research shows that teacher creativity and innovation significantly influence the quality of learning in physical education. Teacher creativity, which encourages the development of new learning methods and creates a stimulative environment, synergizes with teacher innovation, providing variety to stimulate student interest. Improved learning quality in the field of physical education has proven to have a positive impact on student learning achievement. Therefore, increasing teacher creativity and innovation can be crucial to achieving optimal learning achievement in physical education.

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