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THE EFFECT OF THE ACADEMIC ENVIRONMENT ON STUDENTS' LEARNING OUTCOMES WITH CREATIVITY AS A MEDIATING VARIABLE

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Abstract:
Student learning outcomes are one of the indicators of the success of the educational process and are influenced by various internal and external factors. One of the external factors that plays a role in the learning process is the academic environment, while creativity is an internal factor that may serve as a mediating variable in this relationship. This study aims to analyze the effect of the academic environment on students' learning outcomes, the effect of the academic environment on creativity, the effect of creativity on students' learning outcomes, and the role of creativity in mediating the effect of the academic environment on students' learning outcomes. This study employed a quantitative approach with a population consisting of all tenth-grade students at SMA Negeri 58 Jakarta and a sample of 155 students. Data were collected through questionnaires and documentation. The data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with the assistance of SmartPLS. The results showed that the academic environment had a positive and significant effect on students' learning outcomes. The academic environment also had a positive and significant effect on students' creativity. Furthermore, creativity had a positive and significant effect on students' learning outcomes. Creativity was also found to partially mediate the effect of the academic environment on students' learning outcomes, as both the direct and indirect effects were significant. Therefore, a conducive academic environment can improve students' learning outcomes not only directly but also through the development of students' creativity.

Keywords:
academic environment, creativity, learning outcomes, mediation, SEM-PLS

BACKGROUND

Education plays an important role in improving the quality of human resources, with students' learning outcomes serving as one of the indicators of educational success. However, improving learning outcomes remains a challenge in Indonesia, as reflected in national and international assessments. The PISA 2022 results indicate that Indonesian students' performance in mathematics, reading, and science remained below the OECD average (OECD, 2023). In addition, Indonesian students' creative thinking performance was also below the OECD average, highlighting the importance of strengthening both academic achievement and creative competencies.

Students' learning outcomes are influenced by various internal and external factors. The academic environment is one of the important external factors, encompassing physical facilities

as well as social and psychological conditions, such as teacher–student relationships, peer interactions, school culture, and the learning climate. A supportive academic environment can provide students with a conducive atmosphere for learning and opportunities to actively participate, explore ideas, and develop their potential. Meanwhile, creativity enables students to think flexibly and originally, generate ideas, and find alternative solutions to academic problems.

Based on constructivist learning theory, students construct knowledge through active interaction with their learning environment. Thus, a supportive academic environment may stimulate students' creativity, which in turn can contribute to better learning outcomes. Although previous studies have established relationships among the learning environment, creativity, and learning outcomes, studies examining creativity specifically as a mediating variable remain relatively limited, particularly among senior high school students. Therefore, this study investigates the effect of the academic environment on students' learning outcomes, the effect of the academic environment on creativity, the effect of creativity on learning outcomes, and the mediating role of creativity in the relationship between the academic environment and students' learning outcomes.

THEORETICAL FRAMEWORK

Constructivist Learning Theory

This study is grounded in constructivist learning theory, which views learning as an active process in which students construct knowledge through interaction with their environment, experiences, and reflection. Rather than simply receiving knowledge from teachers, students actively interpret, develop, and integrate new information with their existing knowledge. Piaget emphasized the processes of assimilation and accommodation in cognitive development, while Vygotsky (1978) highlighted the importance of social interaction and environmental support in facilitating students' cognitive development

In the context of this study, the academic environment provides the setting in which students interact with teachers, peers, learning resources, and learning activities. A supportive academic environment can provide opportunities for students to ask questions, discuss ideas, explore information, collaborate, and solve problems. These experiences allow students to actively construct knowledge while simultaneously developing their creativity. Consequently, constructivism provides a theoretical basis for explaining the relationships between the academic environment, creativity, and students' learning outcomes.

Academic Environment

The academic environment refers to the physical, social, and psychological conditions surrounding students that influence the learning process. It encompasses not only physical facilities such as classrooms, libraries, laboratories, and learning resources, but also social interactions between teachers and students, relationships among students, school culture, and

the overall academic climate. A conducive academic environment can create a safe, comfortable, and supportive atmosphere that encourages students to participate actively in learning.

The academic environment can be viewed through physical and social dimensions. The physical dimension includes the availability and quality of learning facilities, classroom conditions, lighting, ventilation, cleanliness, and learning comfort. Meanwhile, the social dimension includes interactions between teachers and students, peer relationships, and the broader social support surrounding students. Positive interactions can encourage cooperation, discussion, confidence, and active participation in learning.

From a constructivist perspective, a supportive academic environment facilitates students' active engagement in constructing knowledge. Opportunities to interact, exchange ideas, explore different perspectives, and solve problems can make learning more meaningful. Therefore, the quality of the academic environment is expected to influence both students' learning outcomes and the development of their creativity.

Students' Learning Outcomes

Learning outcomes refer to the abilities acquired by students after participating in the learning process. They reflect the extent to which students achieve predetermined learning objectives and may include cognitive, affective, and psychomotor aspects. Sudjana (2019) describes learning outcomes as abilities possessed by students after receiving learning experiences, while Hamalik (2017) views them as changes in students' knowledge, attitudes, and skills resulting from the learning process.

Learning outcomes are influenced by both internal and external factors. Internal factors include students' intelligence, motivation, interests, abilities, readiness, and psychological conditions, whereas external factors include family, school, and community environments. The academic environment is therefore an important external factor because the quality of teachers, learning facilities, school conditions, and interactions within the learning environment can influence students' engagement and academic achievement.

From the constructivist perspective, learning outcomes are not merely the result of receiving information but are associated with students' active construction of knowledge. When students are provided with an environment that supports interaction, exploration, and meaningful learning experiences, they have greater opportunities to develop their understanding and achieve better learning outcomes.

Creativity

Creativity refers to the ability to generate new, original, and useful ideas, approaches, or solutions. In education, creativity enables students to approach learning problems from different perspectives, develop alternative solutions, and transform existing knowledge into

meaningful forms. Munandar (2014) conceptualizes creativity as the ability to produce new combinations based on existing data, information, or elements, while Guilford (1950) associates creativity with divergent thinking and the generation of multiple alternatives. Torrance (1974) further emphasizes creativity as a process involving problem identification, generation of possible solutions, development and testing of ideas, and communication of results.

In the present study, creativity is represented by four dimensions: fluency, flexibility, originality, and elaboration. Fluency refers to the ability to generate numerous ideas, flexibility refers to the ability to consider different perspectives and approaches, originality refers to producing unique ideas, and elaboration refers to developing and refining ideas into more complete and useful forms.

Creativity is particularly relevant to learning because creative students tend to be more active in asking questions, seeking information, discussing ideas, and developing alternative approaches to academic problems. Moreover, creativity does not develop independently of the learning context. An environment that provides freedom to express ideas, opportunities for exploration, and appreciation of students' opinions can encourage creative thinking.

Relationship Between the Academic Environment, Creativity, and Learning Outcomes

The relationship among the three variables can be explained through constructivist learning theory. A conducive academic environment provides students with meaningful opportunities to interact with teachers and peers, explore information, discuss ideas, and solve problems. These experiences support the active construction of knowledge and create conditions that facilitate the development of creativity.

Previous research also provides empirical support for these relationships. Ahmad and Mawarni, (2021) found that the school environment had a positive effect on students' learning creativity, while Siregar et al. reported positive relationships between the learning environment, learning creativity, and learning outcomes. These findings suggest that a better learning environment may encourage students to become more creative and, consequently, achieve better learning outcomes.

The relationship can therefore be conceptualized as follows: the academic environment influences learning outcomes directly, while it may also influence learning outcomes indirectly by fostering students' creativity. In this model, creativity functions as a mediating mechanism through which the academic environment contributes to students' learning outcomes. This proposition is consistent with the constructivist view that learning develops through students' active interaction with their environment.

Hypothesis Development

H1: The academic environment has a positive effect on students' learning outcomes.

H2: The academic environment has a positive effect on students' creativity.

H3: Creativity has a positive and significant effect on students' learning outcomes.

H4: Creativity mediates the positive relationship between the academic environment and students' learning outcomes.

METHOD

This study employed a quantitative approach and was conducted at SMA Negeri 58 Jakarta. The population consisted of 252 tenth-grade students. The sample comprised 155 students, determined using the Slovin formula with a 5% margin of error. The respondents were selected using proportionate stratified random sampling, with each class treated as a stratum and respondents subsequently selected randomly.

The study involved three variables: academic environment (X) as the independent variable, creativity (M) as the mediating variable, and students' learning outcomes (Y) as the dependent variable. Data were collected through an online questionnaire and documentation. The questionnaire was developed based on the indicators of the academic environment and creativity and used a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Documentation was used to obtain students' learning outcomes and supporting school data.

The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The analysis consisted of descriptive statistics, evaluation of the measurement model (outer model), evaluation of the structural model (inner model), and hypothesis testing. The outer model was evaluated using convergent validity, discriminant validity, Average Variance Extracted (AVE), Composite Reliability, and Cronbach's Alpha. Convergent validity was assessed using outer loadings and AVE, while discriminant validity was evaluated using the Fornell–Larcker criterion and cross-loadings.

The inner model was evaluated using the coefficient of determination (R^2) to assess the model's explanatory power. Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS 4, with decisions based on the t-statistics and p-values. A hypothesis was considered supported when the t-statistic exceeded 1.96 and the p-value was below 0.05. The mediating effect of creativity was assessed using the Specific Indirect Effect obtained through bootstrapping; a p-value below 0.05 indicated a significant indirect effect.

RESULT

Measurement Model

The convergent validity assessment showed that the retained indicators had outer loading values ranging from 0.628 to 0.816. Based on the study criteria, all retained indicators were considered acceptable for further analysis.

The Average Variance Extracted (AVE) values were 0.504 for Learning Outcomes, 0.510 for Creativity, and 0.529 for Academic Environment, all exceeding the minimum criterion of 0.50. This indicates that the three constructs achieved convergent validity.

The reliability assessment also showed satisfactory results. Cronbach's Alpha values were 0.835 for Learning Outcomes, 0.863 for Creativity, and 0.851 for Academic Environment, while Composite Reliability values (rho_c) were 0.877, 0.893, and 0.887, respectively. All values exceeded 0.70, indicating that the constructs demonstrated good internal consistency and reliability.

Structural Model

The coefficient of determination (R^2) for Learning Outcomes was 0.445, indicating that Academic Environment and Creativity jointly explained 44.5% of the variance in students' learning outcomes. The remaining 55.5% was explained by factors outside the research model.

The R^2 value for Creativity was 0.330, indicating that Academic Environment explained 33.0% of the variance in students' creativity, while the remaining 67.0% was attributable to factors not included in the model. The model also obtained an SRMR value of 0.074, which was below the 0.08 criterion, indicating an acceptable model fit.

Hypothesis Testing

The hypothesis testing results demonstrated that all three direct relationships were positive and statistically significant.

Hypothesis	Relationship	β	t-statistic	p-value	Decision
H1	Academic Environment → Learning Outcomes	0.375	4.944	< 0.001	Accepted
H2	Academic Environment → Creativity	0.574	8.629	< 0.001	Accepted
H3	Creativity → Learning Outcomes	0.377	4.619	< 0.001	Accepted

Academic Environment had a positive and significant effect on Learning Outcomes ($\beta = 0.375$, $t = 4.944$, $p < 0.001$). Academic Environment also had a positive and significant effect on Creativity ($\beta = 0.574$, $t = 8.629$, $p < 0.001$). Furthermore, Creativity had a positive and significant effect on Learning Outcomes ($\beta = 0.377$, $t = 4.619$, $p < 0.001$). Therefore, all three direct hypotheses were supported.

Mediation Analysis

The mediation analysis showed that Academic Environment had a positive and significant indirect effect on Learning Outcomes through Creativity, with an original sample coefficient of 0.217, a t-statistic of 3.723, and a p-value of < 0.001.

Thus, Creativity significantly mediates the relationship between Academic Environment and Learning Outcomes. Since the direct effect of Academic Environment on Learning Outcomes also remained positive and significant, the mediation effect was classified as partial mediation.

DISCUSSION

The Effect of Academic Environment on Students' Learning Outcomes

The results of the PLS-SEM analysis indicate that the Academic Environment has a positive and significant effect on Students' Learning Outcomes ($\beta = 0.375$, $t = 4.944$, $p < 0.001$). This finding supports H1 and indicates that students who perceive their academic environment more positively tend to achieve better learning outcomes.

A conducive academic environment can support learning not only through adequate physical facilities but also through positive interpersonal relationships between teachers and students, harmonious peer interactions, and an academic culture that encourages active learning. These conditions can provide meaningful learning experiences, improve students' understanding of learning materials, and consequently contribute to better learning outcomes.

This finding is consistent with constructivist theory, particularly Vygotsky's (1978) view that knowledge is actively constructed through interaction with the social environment. In an educational context, the academic environment provides opportunities for students to discuss, collaborate, exchange experiences, and receive guidance from teachers and peers. Piaget (1972) perspective further suggests that learning occurs through assimilation and accommodation as students integrate new experiences into their existing cognitive structures. Thus, a supportive academic environment can enrich students' learning experiences and facilitate more effective knowledge construction.

The finding is also consistent with Sibarani et al. (2024), who emphasized that physical and social learning environments jointly support the learning process. A comfortable physical environment can facilitate students' concentration, while positive relationships and effective communication can increase students' motivation and participation. The finding is also in line with Slameto (2015), who identified the learning environment as an external factor influencing learning outcomes. Previous studies cited in this research, including those by Sibarani et al. (2024); Rahmawati et al. (2024); and Enjelita, Wulandani, and Evalina (2024), similarly indicate that a supportive school or learning environment contributes positively to students' learning outcomes.

In the context of SMA Negeri 58 Jakarta, the positive relationship suggests that students' perceptions of a supportive academic environment may facilitate active participation,

interaction, and engagement in learning. Therefore, improving learning facilities, strengthening teacher–student relationships, and developing a positive academic culture may contribute to better learning outcomes.

The Effect of Academic Environment on Creativity

The results demonstrate that the Academic Environment has a positive and significant effect on Creativity ($\beta = 0.574$, $t = 8.629$, $p < 0.001$), supporting H2. The relatively strong path coefficient indicates that the academic environment plays an important role in fostering students' creativity.

Creativity can develop through learning experiences that provide students with opportunities to express opinions, discuss ideas, explore alternatives, and solve problems. A supportive academic environment allows students to engage actively rather than simply receive information. Through interaction and exploration, students can develop new ideas and strengthen their flexible thinking abilities.

This finding is consistent with Vygotsky's (1978) constructivist perspective, which emphasizes the importance of social interaction in cognitive development. Discussion, collaboration, and joint problem-solving provide opportunities for students to construct knowledge while simultaneously developing creative thinking. The finding also supports Munandar (2014), who identified the school environment as an external factor that can influence creativity. An environment that appreciates students' ideas and provides opportunities for exploration can encourage creative development.

Furthermore, the finding is consistent with Torrance's (1974) conceptualization of creativity through fluency, flexibility, originality, and elaboration. These abilities require intellectual stimulation and opportunities for students to experiment with different ideas and approaches. The finding also agrees with Ahmad and Mawarni (2021), who found that the school environment has a positive and significant effect on students' learning creativity.

For SMA Negeri 58 Jakarta, the result suggests that an academic environment that encourages discussion, questioning, collaboration, and active participation can provide students with greater opportunities to develop creative thinking. Therefore, schools and teachers can support creativity by implementing learning activities such as project-based learning, problem-based learning, group discussions, and case studies, while maintaining an academic culture that values students' ideas and participation.

The Effect of Creativity on Students' Learning Outcomes

The analysis shows that Creativity has a positive and significant effect on Students' Learning Outcomes ($\beta = 0.377$, $t = 4.619$, $p < 0.001$), supporting H3. This finding indicates that students with higher levels of creativity tend to achieve better learning outcomes.

Creativity enables students to actively process information rather than merely receive it. Creative students may be better able to connect concepts, generate alternative solutions, and approach learning problems from different perspectives. These abilities can facilitate deeper understanding and support students in dealing with academic challenges.

This finding is consistent with constructivist theory, which views learning as an active process of constructing knowledge through experience and interaction. Piaget's perspective emphasizes assimilation and accommodation, while Vygotsky (1978) highlights the role of social interaction in cognitive development. Within this perspective, creativity can facilitate students' ability to transform learning experiences into meaningful knowledge.

The finding also supports Munandar (2014) and Torrance (1974), particularly their emphasis on fluency, flexibility, originality, and elaboration as dimensions of creativity. These abilities can help students generate alternative answers, consider problems from different perspectives, develop original ideas, and elaborate their understanding of learning materials. The result is also consistent with previous research by Siregar, Gultom, and Sinaga, which found a positive and significant relationship between learning creativity and students' learning outcomes.

In the context of SMA Negeri 58 Jakarta, students who are able to think creatively may be better positioned to understand learning materials, participate actively in discussions, and develop learning strategies that suit their needs. The findings therefore suggest that improving learning outcomes should not focus exclusively on knowledge transmission but should also provide opportunities for students to develop creative thinking.

The Mediating Role of Creativity in the Relationship between Academic Environment and Learning Outcomes

The mediation analysis indicates that Creativity significantly mediates the relationship between Academic Environment and Students' Learning Outcomes ($\beta = 0.217$, $t = 3.723$, $p < 0.001$). Therefore, H4 is supported. The finding demonstrates that the academic environment influences learning outcomes not only directly but also indirectly through the development of students' creativity.

A supportive academic environment can provide students with opportunities to discuss, collaborate, ask questions, and explore ideas. These experiences can stimulate creativity, which subsequently helps students process information, develop alternative solutions, and understand learning materials more effectively. Creativity therefore represents an important mechanism through which the academic environment contributes to learning outcomes.

This finding is consistent with constructivist theory, particularly Vygotsky's (1978) emphasis on interaction between individuals and their social environment. The academic environment provides the context in which students actively construct knowledge, while creativity enables them to process and develop their learning experiences. Munandar (2014) similarly emphasizes the role of the school environment in supporting creativity, while Torrance (1974) highlights

the importance of an environment that provides intellectual stimulation and opportunities for independent thinking.

The finding also extends previous research cited in this study. Abbas dan Rizki (2023) demonstrated that a mediating variable can explain how the learning environment influences learning outcomes, although their study used self-regulation as the mediator. In contrast, Ginanjar, Iskandar, and Jumantini (2024) found that learning motivation did not significantly mediate the relationship between learning environment and learning outcomes. The present finding therefore suggests that different psychological variables may play different mediating roles, with creativity demonstrating a significant mediating effect in this study.

Because the direct effect of Academic Environment on Learning Outcomes remained significant while the indirect effect through Creativity was also significant, the mediation is classified as partial mediation. This means that the academic environment continues to influence learning outcomes directly, while part of its effect operates through students' creativity. Creativity therefore does not replace the role of the academic environment but provides an additional mechanism through which the environment can contribute to improved learning outcomes.

Practically, the findings suggest that schools should improve the academic environment while simultaneously creating learning experiences that stimulate creativity. Project-based learning, problem-based learning, collaborative discussions, experimentation, and activities requiring students to generate and develop ideas may help strengthen this mechanism. In this way, improving students' learning outcomes can be approached not only through better academic conditions but also through the development of creativity as an important component of the learning process.

Overall, the findings indicate that Academic Environment contributes to Students' Learning Outcomes both directly and indirectly through Creativity. The results support the constructivist perspective and reinforce the importance of considering both environmental and individual factors when explaining students' learning outcomes.

CONCLUSION

This study concludes that the academic environment has a positive and significant effect on students' learning outcomes and creativity. A supportive academic environment can facilitate effective learning while providing students with opportunities to interact, explore ideas, and develop creative thinking.

The findings also show that creativity positively and significantly contributes to students' learning outcomes. Furthermore, creativity significantly mediates the relationship between the academic environment and learning outcomes, with the mediation identified as partial mediation. This indicates that improving the academic environment can enhance learning outcomes both directly and indirectly by fostering students' creativity.

Overall, the findings highlight the importance of developing a supportive academic environment while simultaneously providing learning experiences that encourage students to think creatively as part of efforts to improve learning outcomes.

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