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Impact of Differentiated Learning Strategies on Student Resilience and Academic Performance at State Junior High School

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Abstract: Differentiated learning strategies aim to improve students' learning outcomes and resilience in facing academic challenges. This study aimed to assess the efficacy of the strategy among ninth grade students at SMP Negeri Gumukmas. This study used a quasi-experimental design with a total of 98 students, divided into intervention and control groups of 49 students each. The instruments used consisted of a learning outcome test sheet developed from the RPP and grids, a learning resilience observation sheet based on Ann Masten indicators, and a validated and reliable questionnaire. The data were analyzed using the Friedman test due to the non-normal distribution of the data. The results showed a significant increase in learning outcomes and resilience for students in the intervention group compared to the control group, with a p-value of less than 0.05. These findings reinforce that differentiated learning strategies are effective in improving learning resilience and improving student learning outcomes.

Keywords: Academic performance; Differentiated learning; Resilience learning

Introduction

Differentiated learning strategies are instructional methods designed to help educators tailor their teaching approaches to accommodate individual students' diverse needs, interests, readiness levels, and learning preferences (Awaru et al., 2024). The objective is to ensure that every student is afforded an equivalent opportunity to reach their fullest potential, irrespective of individual differences (Ahmad et al., 2024). In practical application, educators can adapt learning materials, processes, or products following the individual conditions of students. This adaptability enables each student to progress in alignment with their abilities (Amalia et al., 2023). This educational approach is grounded in the principle that each student possesses unique characteristics; consequently, a singular method may not be universally effective for all learners (Widyawati et al., 2023). It is anticipated that this approach will enhance students' comprehension of the material and foster increased motivation and engagement in the learning process. Nonetheless, the execution of differentiated learning strategies at SMP Negeri Gumukmas, located in Jember Regency, has yet to achieve full optimization in practice. One of the most significant challenges encountered by this institution is the low resilience exhibited by the students, as numerous individuals demonstrate limited proficiency in managing obstacles or academic pressures. When confronted with challenges, such as complex assignments or difficulties in comprehending the material, individuals often experience a decline in motivation, which can lead to cessation of effort and subsequently result in suboptimal learning outcomes. Traditional learning methods in schools often fail to address individual student needs, causing some to fall behind academically.

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The government of Indonesia, through the Ministry of Education, Culture, Research, and Technology, has emphasized the importance of an education system that is aligned with the needs and requirements of students (Lindner et al., 2020). This emphasis is clearly articulated in the Merdeka Belajar policy, as delineated in Regulation Number 13 of 2022, which introduces amendments to Regulation Number 22 of 2020 issued by the Minister of Education and Culture. Within the framework of this policy, differentiated learning strategies are regarded as one of the principal approaches that can facilitate the attainment of inclusive and high-quality education (Yevdokymova, 2024). Through the implementation of adaptive learning tailored to the distinct characteristics and capabilities of individual students, the expectation is that such an approach will facilitate improved academic outcomes and foster greater resilience in navigating the challenges of their educational pursuits. The support derived from this government policy serves as a vital foundation for the expansion of the implementation of this strategy in educational institutions, including SMP Negeri Gumukmas.

The challenge of cultivating resilience and enhancing student learning outcomes is not solely a phenomenon observed at SMP Negeri Gumukmas; it is a widespread issue affecting numerous educational institutions across Indonesia. Many students face difficulties in following learning that is equal for all, which ultimately leads to inequality in learning outcomes. This is especially evident in students who have different learning styles or have special needs in learning. The magnitude of this issue is considerable, as numerous educational institutions continue to implement a uniform approach to learning without taking into account the unique differences among individual students, resulting in inconsistent learning outcomes. In many places, this has led to a decline in the overall quality of education.

Specifically, in SMP Negeri Gumukmas, the problem of low learning resilience and student learning outcomes has become a serious concern. In recent years, the institution has observed a notable decline in students' motivation for learning, particularly when confronted with challenging assignments or examinations. Certain students exhibit a lack of perseverance in the face of challenging learning experiences, which subsequently results in a deterioration of their academic performance. This situation is further aggravated by the implementation of teaching methods that lack flexibility and fail to address the individual needs of each student. This fact shows that more responsive learning strategies, such as differentiated learning, are needed to overcome this problem. The acquisition of resilience pertains to the capacity to maintain motivation and to persevere in the face of challenges encountered throughout the learning process (Romano et al., 2021). Learning resilience is very important for forming a strong character in facing learning dynamics that are not always easy. Students exhibiting high levels of learning resilience are generally more adept at managing academic stress. They exhibit a heightened level of confidence in their problem-solving capabilities and demonstrate a strong commitment to ongoing learning, even when confronted with challenges (Duan et al., 2024). At SMP Negeri Gumukmas, it has been observed that students who exhibit difficulties in adapting to instructional methods that do not align with their preferred learning styles have experienced a decline in their resilience in learning. This causes them to give up more easily when faced with difficulties, so their learning outcomes decline.

Learning outcomes are a reflection of the effectiveness of the learning process applied (Irawan et al., 2022). At SMP Negeri Gumukmas, the academic performance of students in various disciplines, particularly in religious studies, has not met the anticipated benchmarks. Many students fail to achieve the minimum graduation standards, especially students with more specific learning needs. Differentiated learning, when implemented effectively, possesses the capacity to enhance educational outcomes by offering tailored opportunities that align with the individual abilities and learning styles of each student (Bernacki et al., 2021). This is expected to reduce academic gaps and improve overall student achievement. In the early part of 2021, the government commenced a rigorous initiative to promote the concept of independent learning, emphasizing a more adaptive and personalized approach to education (Kemendikbud RI, 2021). Since then, several schools have begun to try implementing differentiated learning. At SMP Negeri Gumukmas, discussions regarding the implementation of this strategy have commenced; however, the actual execution remains in the preliminary stages. Many teachers find it difficult to adjust uniform teaching methods. This condition hinders the optimal implementation of differentiated learning strategies within the educational institution, resulting in subpar student learning outcomes and insufficient learning resilience.

To address this issue, it is imperative to adopt a more systematic approach in the implementation of differentiated learning at SMP Negeri Gumukmas. Teachers need to receive special training to understand this concept and how to apply it in the classroom. Moreover, it is imperative to implement adjustments to the curriculum and evaluation methods to ensure the effective execution of this strategy (Safitri et al., 2023). This study aims to investigate the impact of

differentiated learning strategies on resilience in learning and overall student learning outcomes. The objective is to generate well-founded recommendations for educational institutions concerning the implementation of more adaptive teaching methodologies. This research aspires for SMP Negeri Gumukmas to enhance the implementation of differentiated learning strategies, thereby facilitating an increase in student learning resilience and ensuring that learning outcomes meet the anticipated targets. Additionally, this research is anticipated to make a significant contribution to the formulation of more inclusive and adaptive educational policies, in alignment with the principles of independent learning promoted by the government. In the long term, it is anticipated that the implementation of differentiated learning strategies will facilitate the development of greater independence, resilience, and success among students as they confront various academic and life challenges.

Method

This study used a research design with both intervention and control groups to assess the impact of differentiated learning strategies on students' learning resilience and learning outcomes. The research was conducted employing a total sampling method, resulting in a study population consisting of 98 eighth-grade students at SMP Negeri Gumukmas. The population in question was equally divided into two groups: one intervention group consisting of 49 students and a control group, which likewise comprised 49 students. Data collection was conducted utilizing a diverse array of instruments, specifically test sheets that were derived from the Learning Implementation Plan, in addition to relevant grids designed to evaluate learning outcomes. Furthermore, observation sheets designed for evaluating. This research uses the Quasi Experiment type. According to Indra (2021), experimental research is a study that identifies the causal relationship between independent variables and dependent variables, where the independent variable is controlled in such a way that the effect caused to the dependent variable can be known. The independent variables in this study are the impact of differentiated learning strategies, while the dependent variables are motivation and learning achievement. The following is the experimental design that the researcher used.

Tabel 1. Nonequivalent Pretest-Posttest Control Group Design (Indra, 2021)

Group	Pretest	Treatment	Posttest
Experiment	0_1	X	0_2
Control	0_1	-	0_2

Learning resilience were developed using the indicators of learning resilience as proposed by Ann Masten. Furthermore, a questionnaire was employed to supplement the data, having undergone thorough validity and reliability assessments, and was subsequently deemed both valid and reliable.

The acquired data underwent analysis employing the Friedman statistical test, given that the results suggested a lack of conformity to a normal distribution. This analysis seeks to identify noteworthy differences in student learning outcomes and learning resilience between the intervention and control groups at each phase of the educational process. This approach aims to yield extensive empirical evidence concerning the efficacy of differentiated learning strategies in enhancing student learning outcomes and fostering resilience within educational environments.

Result and Discussion

The results of the Friedman test indicate that within the intervention group, there was a statistically significant enhancement in learning outcomes, evidenced by the increase in the mean rank from 1.04 during the pretest to 3.57 at the third meeting. The Chi-Square value of 103.829 with a p-value of 0.000 indicated a significant difference between meetings. Conversely, within the control group, the mean rank demonstrated relative stability, accompanied by a p-value of 0.725, which suggests that there was no significant alteration in the learning outcomes. Concerning the resilience learning variable, the intervention group exhibited a notable increase, as evidenced by the mean rank rising from 1.00 during the pretest to 3.01 at the third meeting (Chi-Square = 145.545, p-value = 0.000). On the other hand, the control group did not experience any significant changes, as shown by the p-value of 0.112.

Table 1. Friedman Test Results

Variable			Day						
			Pretest	Day 1	Day 2	Day 3	Chi-Square	Df	P-Value
Academic	Intervention Group	Mean Rank	1.04	2.37	3.02	3.57	103.829	3	0.00
Performance	Control Group	Mean Rank	2.38	2.61	2.57	2.44	1.316	3	0.725
Resilience	Intervention Group	Mean Rank	1.00	2.98	3.01	3.01	145.545	3	0.000
Learning	Control Group	Mean Rank	2.46	2.54	2.46	2.54	6.000	3	0.112

Table 2. Academic Performance and Resilience Learning Post-Hoc Test Results

Academic Performance						Resilience Learning					
Day-day	Test Statistic	Std. Error	Std. Test Statistic	Sig	Adj. Sig	Day-day	Test Statistic	Std. Error	Std Test Statistic	Sig	Adj. Sig
Pretest-1	-1.327	0.261	-5.086	0.000	0.000	Pretest-1	-1.980	0.261	-7.590	0.000	0.000
Pretest-2	-1.980	0.261	-7.590	0.000	0.000	Pretest-2	-2.010	0.261	-7.707	0.000	0.000
Pretest-3	-2.531	0.261	-9.703	0.000	0.000	Pretest-3	-2.010	0.261	-7.707	0.000	0.000
1- 3	-1.204	0.261	-4.617	0.000	0.000						

The learning outcomes presented in the aforementioned table indicate that there were significant mean rank differences observed in each pair of meetings within the intervention group, accompanied by a standardized p-value of 0.000. This shows that the intervention provided has a real impact on improving student learning outcomes at each stage. The same trend is evident in the resilience learning variable, wherein all pairs of meetings demonstrate statistically significant differences, as reflected by a standardized p-value of 0.000. This underscores the efficacy of the intervention in enhancing student learning resilience.

Table 3. Kruskal-Wallis Test Result

Day	Academic Performance					Resilience learning				
	Mean rank		Chi-square	Df	Asymp. sig	Mean rank		Chi-square	Df	Asymp. sig
	Control Group	Intervention Group				Control Group	Intervention Group			
Pretest	46.49	52.51	1.106	1	0.293	48.93	50.07	0.040	1	0.842
1	70.66	28.34	54.501	1	0.000	74.00	25.00	72.819	1	0.000
2	72.03	26.97	61.681	1	0.000	74.00	25.00	72.818	1	0.000
3	73.54	25.46	70.184	1	0.000	74.00	25.00	72.818	1	0.000

The findings from the Kruskal-Wallis test indicated that significant differences were observed between the control and intervention groups for both learning outcome variables and resilience learning. In the evaluation of learning outcomes, noteworthy disparities were observed between the initial meeting and the third meeting. The Chi-Square statistic demonstrated a consistent increase, escalating from 54.501 in the initial meeting to 70.184 in the subsequent third meeting, with an associated p-value of 0.000. The same results were observed in the domain of resilience learning, where significant differences were noted across all meetings, evidenced by a consistent Chi-Square value of 72.818 and a p-value of 0.000. This data underscores the reliability of the intervention's impact on student learning resilience.

Discussion

Academic Performance

The findings indicated that the intervention group improved learning outcomes, with the mean rank rising from 1.04 in the pretest to 3.57 in the third meeting (p-value 0.000). In contrast, the control group did not show a significant change (p-value = 0.725). These results indicate that differentiated learning strategies significantly improve student learning outcomes.

Scientifically, these findings can be explained through the cognitive mechanisms outlined in the revised version of Bloom's taxonomy theory (Mahmudi et al., 2022). In differentiated learning, students are provided with educational experiences tailored to their learning styles and levels of readiness (Sapan et al., 2022). This methodology facilitates the attainment of proficiency in fundamental concepts before advancing to more sophisticated cognitive levels, including analysis, evaluation, and creation (Gunawan et al., 2016). This process similarly enhances students' intrinsic motivation, as elucidated in the self-determination theory, which underscores the significance of experiences related to autonomy, competence, and interpersonal relationships in the context of learning (Ryan et al., 2020).

During the initial stages of the assessment (pretest), a majority of the students within the intervention group predominantly displayed basic cognitive competencies, specifically in the realms of memory recall and comprehension. This observation aligns with the findings of the study conducted by Rachmadhani et al. (2023), which indicated that a majority of students at the onset of their learning journey tend to depend predominantly on basic cognitive processes. Nevertheless, through the implementation of differentiated learning strategies, which incorporate the use of diagrams for visual learners and interactive discussions for auditory learners, students are better equipped to comprehend and process more intricate information. At the second meeting, students began to show the ability to apply knowledge in real contexts. This may be because the approach used is relevant to students' daily lives, increasing their cognitive engagement. Gerard et al. (2022), reported that the relevance of learning materials is a significant factor in

enhancing student learning outcomes, particularly in the realm of science education. At the third meeting, students in the intervention group showed significant improvements in analytical and evaluation skills. Students were able to identify relationships between concepts and evaluate information based on their understanding. The research conducted by Laumarang et al. (2023), corroborates this finding, demonstrating that differentiated learning through the application of the discovery learning model significantly enhances students' critical thinking skills. While the creation stage in Bloom's taxonomy is not quantitatively assessed, this finding illustrates the potential of differentiated strategies in fostering student creativity (Gunawan et al., 2016). Heterogeneous groups formed for project-based assignments provide students with the opportunity to learn from each other and generate new solutions. This is in line with Vygotsky's constructivist theory, which emphasizes the importance of collaboration in learning.

The observed trend of improved learning outcomes within the intervention group may be further elucidated by encouraging them to engage with more complex tasks. Conversely, the control group employing traditional learning methods did not exhibit significant changes, presumably due to the approach's insufficient focus on students' individual needs.

The findings of the current study corroborate the findings of Haelermans (2022), which indicated that differentiated learning strategies enhance learning outcomes by fostering increased motivation, self-regulation, and metacognition. Furthermore, this study aligns with the findings of Rachmadhani et al. (2023), which indicated that 94% of the relevant studies demonstrated a positive effect of differentiated learning strategies on student learning outcomes. However, this study extends previous findings by showing its impact on various cognitive stages, from remembering to analyzing.

This study shows that differentiated learning strategies are an effective approach in improving student learning outcomes. By offering modifications tailored to individual learning requirements and preferences, this strategy facilitates the mastery of diverse cognitive levels, ranging from foundational to advanced. These findings substantiate the research objective of assessing the efficacy of differentiated learning strategies within heterogeneous classrooms, while simultaneously contributing to the academic literature regarding the application of this approach in specific local contexts.

Resilience Learning

The findings indicated that the intervention group, specifically students trained in differentiated learning strategies, demonstrated a notable improvement in resilience learning. Their average increased from 1.00 in the pretest to 3.01 in the third meeting. The observed increase suggests that differentiated learning strategies positively influence the development of student resilience in learning, as evidenced by a p-value of 0.000. This finding indicates that the difference is highly statistically significant. In contrast, the control group using conventional learning methods showed stability in their average scores, with a p-value of 0.112. This suggests that there was no noteworthy alteration in the resilience learning of the control group, indicating that conventional methods are less effective in promoting student resilience learning.

The concept of resilience in learning, as delineated in this study, aligns with Ann Masten's definition (2014), which defines resilience as the capacity of individuals to confront and surmount challenges encountered during the learning process, as well as their ability to recover from adversities (Masten, 2014). In the context of students, this encompasses the capacity to maintain motivation, persevere in the face of adversity, and continue to endeavor towards the attainment of their educational objectives despite encountering obstacles (Tause, 2024). For instance, when students encounter challenges in comprehending the material related to their beliefs concerning the last day, they can recover effectively through the implementation of supportive learning strategies (Chew et al., 2021). This resilience is crucial to ensure that students not only comprehend the material cognitively but also cultivate a persistent and tenacious attitude toward learning (Peterson, 2023).

Differentiated learning strategies are essential in fostering student learning resilience, as this methodology customizes education to align with the diverse needs, interests, and readiness levels of each learner (Alhomairi, 2024). In this study, differentiated learning strategies were employed through the provision of additional time and a comprehensive approach tailored for students who faced challenges in grasping the material. Conversely, students who understood faster were given more challenging tasks to develop their potential. This approach succeeded in reducing frustration because students felt that the challenges given were under their ability level. Furthermore, the successful completion of adjusted tasks has significantly enhanced their self-confidence, which serves as a crucial foundation for cultivating learning resilience to confront greater challenges in the future.

The enhancement of learning resilience that arises from the implementation of differentiated learning strategies is substantiated by the growth mindset theory articulated by Carol S. Dweck in 2006. According to this theory, students who possess the belief that their intelligence and abilities can be cultivated through

persistent effort and learning demonstrate a greater capacity to confront challenges (Alam et al., 2023). Differentiated learning strategies help students see adversity not as an obstacle, but as an opportunity for growth (Leibel et al., 2021). By providing appropriate challenges, students understand that each successful challenge is a step toward improving their abilities. This creates a positive cycle, where success increases self-confidence, while self-confidence strengthens their resilience to face more complex challenges. Differentiated learning strategies also support independent learning, which is an important component of resilience learning (Dayagbil et al., 2021). In differentiated learning strategies, students are given the freedom to choose a learning method that suits their learning style (Kemendikbudristek RI, 2023). With this freedom, students can develop problem-solving skills and strategies to deal with adversity independently. In the context of this study, students are allowed to determine their preferred mode of learning, whether that be through engaging in group discussions or by undertaking detailed individual assignments. This autonomy fosters greater resilience among students when confronted with academic pressures, such as challenging examinations or assignments, as they have already established effective strategies for coping.

Research conducted by Fatimah et al. (2021), indicates that differentiated learning strategies markedly enhance students' learning resilience during mathematics instruction. By categorizing students based on their distinct learning styles, such strategies promote enhanced engagement, confidence, and collaboration among learners. Consequently, this approach culminates in a higher percentage of students attaining the desired learning outcomes. Research from Cagapea et al. (2023), indicates that the implementation of differentiated learning strategies can substantially enhance students' resilience in their educational pursuits. The findings of this study suggest that educators effectively addressed individual differences, thereby enhancing student engagement and fostering adaptive coping mechanisms among students. Research conducted by Safrudin et al. (2024), has demonstrated that differentiated learning strategies enhance learning resilience by focusing on the diverse needs, interests, and readiness levels of each student. Under the research conducted by Hidayat et al. (2024), it was found that the application of differentiated learning has a positive impact on intelligence as it pertains to problem-solving, thereby enhancing resilience in the learning process.

Within the scope of this study, the provision of emotional and cognitive support through differentiated learning strategies not only fosters a sense of validation among students but also diminishes the anxiety that frequently obstructs the learning process. Thus, students become more engaged in learning and more resilient in facing challenges. Overall, differentiated learning strategies not only enhance students' academic outcomes regarding the topic of Faith in the Last Day but also substantially foster their resilience. This approach provides challenges that are appropriate to students' abilities, supports independent learning, and strengthens their cycle of self-confidence. Through the minimization of frustration and the provision of adaptive support, differentiated learning strategies facilitate the development of mental and emotional resilience in students, which is essential for the attainment of academic objectives. This aligns with the objective of holistic education, which emphasizes not only academic success but also the cultivation of students' character, preparing them to become resilient individuals capable of confronting various challenges in the future.

Conclusion

Differentiated learning strategies markedly enhance student achievement and foster resilience. This study demonstrated the effectiveness of a tailored teaching approach in meeting individual learning needs and encouraging students' adaptive mechanisms. The Chi-Square statistic demonstrated a consistent increase, escalating from 54.501 in the initial meeting to 70.184 in the subsequent third meeting, with an associated p-value of 0.000. The same results were observed in the domain of resilience learning, where significant differences were noted across all meetings, evidenced by a consistent Chi-Square value of 72.818 and a p-value of 0.000. This data underscores the reliability of the intervention's impact on student learning resilience. The findings indicate that the implementation of differentiated learning strategies not only enhances students' learning outcomes but also equips them with the resilience required to confront academic challenges. These results support the research objectives and emphasize the importance of personalized education in achieving equal learning opportunities.

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