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Development of a Differentiated Learning Model to Improve Student Academic Achievement in Economics Learning at SMAN 5 Cirebon

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ABSTRACT

Objective: This study aims to determine the improvement of student academic achievement after the implementation of a differentiated learning model in economics learning at SMAN 5 Cirebon, and to identify teacher strategies in integrating content, process, and product differentiation in economics learning. **Method:** This research employed a qualitative descriptive approach with the economics teacher and students of class X-7 as subjects, selected through purposive sampling. Data were collected through observation, in-depth interviews, and documentation, then analyzed using the Miles and Huberman interactive model with data validity ensured through source, technique, and time triangulation. **Results:** The findings reveal that the implementation of the differentiated learning model had a significantly positive impact on student academic achievement, marked by an increased number of students meeting the Minimum Competency Criterion (KKM), more evenly distributed scores, and enhanced student engagement and conceptual understanding of economics. Teacher strategies encompassed content differentiation through varied VAK-based learning resources (visual, auditory, kinesthetic); process differentiation through prompting questions, small groups with assigned roles, and random questioning techniques; and product differentiation through task options aligned with learning styles — posters for visual learners, oral presentations for auditory learners, and videos or simulations for kinesthetic learners — while maintaining the same learning objectives. **Novelty:** The VAK modality-based identification of student learning styles served as the primary foundation for all differentiation strategies, although implementation is still in the development stage and faces challenges such as time constraints and classroom management complexity.

INTRODUCTION

Education is the primary foundation for building the quality of superior, adaptive, and competitive human tesources in the era of globalization. In the context of the 21st century,education is no longer solely oriented toward cognitive mastery of content, but also emphasizes the development of critical thinking, creativity, communication, and collaboration skills (Lubis et al., 2023). This paradigm shift demands transformation in school learning practices, including at the Senior Haigh School level. Teacher as learning facilitators ar expected to design meaningful, relevant and responsive learning experiences that address the diverse needs of student (Samsudin, 2021).

One reality that cannot be ignored in the learning process in the diversity of student characteristics. Each student possesses unique characteristics, including differen backgrounds, baliefs, ability levels, needs, interests, and learning styles (Wahyudi & Dermawan, 2024). In economics learning at the senior high school level, this issue is frequently encountered. The economics subject not only requires understanding of theoretical concepts, but also the ability to analyze economic phenomena in everyday life. However, economics learning is still often conducted though lecture methods and written assignments that tend to emphasize concep memorization, thus failing to adequately accimmodate the diversity of studens' learning style.

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Learning style is one key factor that plays and important role in infuencing the quality of individual success during the learning process (Ananda et al., 2024). de Porter & Henarcki (2011) categorize learning styles into three modalities, namely visual, auditory, and kinestetic (VAK): visual learnes learn through what they see, auditory learners through what they hear, and kinestetic learners through movement and touch (Fendrik et al., 2022). These differences indicate that unifrom learning strategies are not necessarily effective for all students (Supit et al., 2023).

Homogeneous learning can result in suboptimal academic achievement for some studens, creating learning gaps, decreased motivation, and reduced student participation. Based on these issues, innovation that can systematically accommodate students diversity is needed. Differentiated learning developed by (Tomlinson, 2000) is an effort to adjust the classroom learning process to meet the individual learning needs of each student, tailored based on student readiness, interests, and learning profiles.

According to Tomlinson (2001), there are three main aspects of differentiated learning: content differentiated (what students learn), process differentiated (how students learn and process information), and product differentiation (how students demonstrate learning outcomes) (Wahyuni, 2022). Several previous studies have demonstrated the potential of differentiated learning in improving learning outcomes. (Junika et al., 2024) found that 92% of students achieved the Minimum Compatency Criterion (KKM) following VAK-based differentated learning. (Kadek et al., 2024) reported an improvement in learning mastery from 72.22% in Cycle I to 86.11% in Cycle II. Waruwu & Bilo, (2025) identifited effective strategies including the use of varied methode and the creation of inclusive environments.

However, research at the senior high school level remains limited. Previous studies generally applied differentiation strategies broadly without developing contextual operational models. Recent evidence continues to reinforce this potential: the implementation of differentiated instruction supported by diagnostic assessment data has been shown to have significant positive effect on students learning process and outcome (Juddin & Pranahita, 2025), while a regression-based analysis of differentiated learning under the Merdeka Curriculum confirmed its positive effect on student learning outcomes at the senior high school level (Marlina & Muharja, 2024). The urgency of this research is heightened by the demens of the Merdeka Curriculum, which emphasizes student-centered learning and appreciation of diversity. This study aims to: (1) determain the improvement of student academic achievement after the implementation of a differentiated learning model, and (2) identify teacher strategies in integrating content, process, and product differentiation in economics learning at SMAN 5 Cirebon.

RESEARCH METHOD

This study employed a qualitative approach with a descriptive research design. The qualitative approach was chosen because this study aims to gain an in-depth understanding of the process of developing and implementing a differentiated learning model in the real context of economics learning at SMAN 5 Cirebon. Qualitative research enables researchers to explore phenomena holistically, uncover meaning, and understand the experiences of teachers and students throughout the learning process.

The study was conducted at SMAN 5 Cirebon in the Economics subject. Research subjects were selected through purposive sampling, comprising: (1) the Grade X

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Economics teacher implementing the differentiated learning model; (2) students of Class X-7 at SMAN 5 Cirebon enrolled in Economics; (3) supporting documents such as teaching modules and data on improving student learning achievement. The selection of these subjects was based on their direct involvement in the implementation of differentiated learning.

Data were collected through three techniques. First, participatory observation to directly observe the differentiated learning process in the classroom, recording teacher and student activities, the forms of differentiation applied, and interactions occurring. Second, in-depth interviews with the teacher and representative students based on different learning styles, to gather information on planning, considerations, learning experiences, as well as challenges and strengths of the model. Third, documentation involving the collection of teaching modules, assessment instruments, and student learning outcomes before and after model implementation.

Two distinct but complementary frameworks underpin the methodological design of this study. Creswell (2014) provides the overarching qualitative research framework, establishing that the researcher serves as the primary instrument (human instrument) in qualitative inquiry (Trimurti et al., 2025). Within this framework, the researcher functions as planner, data collector, analyzer, and interpreter, supported by flexible observation guides, interview guides, and documentation sheets. This perspective emphasizes the researcher's role in constructing meaning through direct engagement with participants and the research context.

In contrast, the Miles and Huberman interactive analysis model operates specifically at the data analysis stage, providing a structured, cyclical procedure for handling qualitative data once it has been collected. While Creswell's framework addresses the broader epistemological and procedural foundations of qualitative research, Miles and Huberman offer a concrete analytical mechanism encompassing three iterative stages: data reduction (selection and focusing of relevant meaning units), data presentation (in the form of descriptive narratives and tables), and conclusion drawing and verification conducted progressively based on patterns, themes, and relationships among data (Pratama & Yamin, 2025). The interactive nature of this model means that these three stages do not proceed linearly but cycle back upon one another, allowing the researcher to refine interpretations continuously. Together, Creswell's framework and the Miles and Huberman model complement each other: the former guides the overall research design and instrumentation, while the latter provides the analytical tools for systematically deriving findings from the data.

Data validity was ensured through source triangulation (comparing data from the teacher, students, and documents), technique triangulation (simultaneously using observation, interviews, and documentation), time triangulation (collecting data at different times), and member checking by requesting confirmation from informants.

RESULTS AND DISCUSSION

Improvement of Student Academic Achievement Following the Implementation of the Differentiated Learning Model

Based on the results of interviews and observations conducted at SMAN 5 Cirebon, the implementation of the differentiated learning model had a significantly positive impact on student academic achievement in economic. The Grade X economics teacher, Saiful

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Bachri Abdullah, S.Pd., stated that "Student achievement improved: scores were more evenly didtributed, the number of student meeting the KKM increased, and student engagement and comprehension improved" This finding aligns with (Tomlinson, 2014), who affirmed that differentiated learning consistently contributes to improved student academic outcomes when teachers are able to adjust content, process, and product to individual needs. Hariyono et al., (2025) also found that the implementation of differentiated learning yielded improvement in student learning outcomes, with the average score rising to 68.50 and the classical mastery percentage increasing 50.28%.

These qualitative accounts are corroborated by quantitative documentation of student economics score in class X-7 (n=38) before and after the implementation of the differentiated learning model, as presented in Table 1.

Table 1. Student Economics Scores Before and After the Implementation of the Differentiated Learning Model (Class X-7, n=38)

Indicator	Before	After
Mean score	63.16	82.63
Median score	60.00	90.00
Standard deviation	14.53	16.01
Lowest-highest score	30-90	60-100
Students meeting KKM (≥ 75)	9 (23.7%)	27 (71.1%)
Students showing score improvement)		31 of 38 (81.6%)

As shown in Table1, the class average rose from 63.16 to 82.63, and the proportion of students meeting the Minimum Competency Criterion (KKM=75) nearly tripled from 23.7% (9 of 38 students) to 71.1% (27 0f 38 students). The score distribution also (81.6%) recorded a score increase, while only 3 student (7.9%) experienced a decline, indicating that the positive effect of the differentiated learning model was broadly, though not uniformly, distributed across the class.

Improvement was not only evident in grade achievement, but also in deeper conceptual understanding. The teacher observed that students "were able to explain concept in their own words, connect them to real life,actively participate in discussions, and produce higher-quality work". This shift a cognitive advancement from memorization toward analysis and evaluation in line with Bloom's Taxonomy. Nadia et al., (2025) also confirmed that learning strategies designed with student needs in mind have a significan impact on academic achcievment. (Jufri et al., 2026) found that differentiated learning functions as an effective pedagogical mechanism for developing studens' 21st-century skills, including critical thinking, creativity, collaboration, and communication.

Student perspectives further reinforced these findings. A student in clas X-7, Nauval Abdul Faqih,conveyed that "Factors influencing his learning outcomes include: effort, teaching methods, learning environment, teacher motivation, classroom atmosphere, and learning approach". This multifactorial perspective indicates that improvments in academic achivement within the context of differentiated learning cannot be separated

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from the role of the overall calssroom ecosystem. Febrian et al., (2025) confirmed that a conducive learning environment not only supports academic achievement but also develops important competencial such as perseverance, discipline, and teameork.

The use of diverse multimedia also contributed significantly to improvements in academic achievement. Student Nauval confirmed that "The use of media such as videos, images, and audio makes that material more engining and easier to understand". This aligns with Clark and Paivio's (1999) dual-coding theory, which explains that information processed through two channels (verbal and non-verbal) is more easily understood and retained (Suprihatien et al., 2024). Mayer also stated that the combination of words alone (Maharani et al., 2024). Adriansyah, (2021) noted that there is a positive influence of interactive multimedia use on learning styles, and that learning styles positively influence student learning outcomes (Jaenudin et al., 2025).

The research findings demonstrate that the differentiated learning model is effective in improving student academic achievement in economics at SMAN 5 Cirebon. This effectiveness can be explained through the Vygotskian theoretical framework, in which learning aligned with students' Zone of Proximal Development (ZPD) allows them to develop optimally. When teachers adjust instruction to students' abilities and learning styles, social interaction in small groups becomes effective scaffolding for cognitive development (Damanik et al., 2025). The increase in the number of students meeting the Minimum Competency Criterion (KKM) is a concrete indicator of the success of differentiated learning implementation. (Agusta et al., 2024) confirmed that differentiated learning can enhance students' intrinsic motivation because learning materials are tailored to their interests and needs.

Teacher Strategies in Integrating Content, Process, and Product Differentiation

The research findings reveal that the teacher at SMAN 5 Cirebon has developed structured strategies for integrating the three dimensions of differentiation as conceptualized by Tomlinson (2001), namely content, process, and product differentiation (Wahyuni, 2022). Integration of these three dimensions is implemented simultaneously within each learning unit, albeit still in the development and refinement stage. The teacher stated that "The implementation of differentiated learning is still in the development stage, but it has already had a positive impact on the engagement and understanding of Grade X students", indicating the teacher's awareness of the importance of ongoing reflection and improvement.

Regarding content differentiation, the teacher presents the same economics material using various formats and learning resources. The teacher stated that "Variations in learning resources include: written, audio, visual, practical, and interactive digital formats", and emphasized that "Adjusting the material does not mean creating three different versions, but rather presenting the same material in different ways: visual, auditory, and kinesthetic". Faishal and Ahmadi, (2025) affirmed that differentiation utilizing varied learning methods is capable of enhancing student engagement and learning comfort. Sousa and Tomlinson, (2018) also emphasized that effective content differentiation focuses on variation in delivery medium rather than differences in learning objectives.

Process differentiation is implemented through the management of inclusive and varied classroom activities. The teacher applies "Prompting questions, small group methods with assigned roles, and random questioning techniques so that all students are

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actively thinking". This strategy ensures that every student, regardless of their learning style, receives an equal opportunity to engage in the learning process. Student Nauval confirmed that "The most helpful activities are group discussions and practice problems because we can exchange ideas and understanding is better when there is hands-on practice". Nafilata et al., (2025) stated that cooperative learning is also a relevant tool because it respects individual differences and promotes the equitable development of student potential.

In terms of product differentiation, the teacher gives students the freedom to choose the form of their learning output according to their learning styles, while still adhering to the same objectives and criteria. Specifically, the teacher applies a "Task choice strategy: posters or visual works for visual learners, oral presentations for auditory learners, and video production or simulations for kinesthetic learners". This freedom to choose the product form grants students autonomy while simultaneously enhancing their intrinsic motivation. Agusta et al., (2024) confirmed that differentiated learning can enhance students' intrinsic motivation because learning materials are tailored to their interests and needs.

The process of identifying student learning styles serves as an important foundation in designing differentiation strategies. The teacher conducts identification by "Combining all three VAK modalities, with the results used to design more diverse learning experiences rather than pigeonholing students". In class X-7, the distribution of learning styles shows genuine diversity: some students are predominantly visual, some auditory, and some kinesthetic. Susilawati et al., (2025) affirmed that the crucial factor influencing the effectiveness of the learning process is an understanding of each individual's learning style.

The implementation of differentiation strategies faces a number of challenges. The teacher acknowledged constraints including differences in student ability, time limitations, more complex classroom management, and difficulties in assessment. To address these, the teacher applies practical solutions such as efficient time management, the use of clear assessment rubrics, improvement of teacher competence, and utilization of available school resources. These findings are consistent with (Supriana et al., 2024), who stated that challenges in differentiated learning include time management, implementation complexity, teacher competence development, and heterogeneous classroom management.

Overall, the effectiveness of integrating content, process, and product differentiation at SMAN 5 Cirebon still needs to be continuously developed alongside improvements in teacher pedagogical competence. The teacher affirmed that "Differentiated learning is quite effective in improving student engagement and learning outcomes; however, its effectiveness depends on the teacher's planning, management, and evaluation". (Tomlinson and Imbeau, 2023) emphasize that differentiated learning is an ongoing journey. Asyauqiya et al., (2025) confirmed that this requires teachers to possess sound pedagogical competence in order to design, implement, and evaluate learning creatively and effectively in accordance with student needs..

CONCLUSION

Based on the research findings and discussion, the following conclusions can be drawn. First, the implementation of the differentiated learning model was proven to significantly

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improve student academic achievement in economics at SMAN 5 Cirebon. Improvement was marked by an increased number of students meeting the Minimum Competency Criterion (KKM), more evenly distributed scores, and enhanced student engagement and conceptual understanding. Students were able to explain economics concepts in their own words, connect them to real-life phenomena, and produce work of higher quality. The use of diverse multimedia—videos, images, and audio—also contributed to facilitating student comprehension across various learning modalities.

Second, the economics teacher at SMAN 5 Cirebon has developed structured strategies for simultaneously integrating content, process, and product differentiation within each learning unit. In content differentiation, the teacher presents the same material through various formats and learning resources. In process differentiation, the teacher applies prompting questions, small groups with assigned roles, and random questioning techniques. In product differentiation, the teacher provides freedom to choose the form of tasks according to learning style—posters for visual learners, oral presentations for auditory learners, and videos or simulations for kinesthetic learners—while adhering to the same objectives and criteria. VAK modality-based identification of student learning styles serves as the primary foundation for designing these differentiation strategies, although implementation still faces challenges such as time constraints and the complexity of classroom management.

Implication

The findings of this study carry significant practical and theoretical implications. Practically, the results demonstrate that the differentiated learning model can serve as a primary approach in planning economics instruction at the senior high school level, particularly in classrooms characterized by high diversity in student learning styles. Teachers need to be equipped with adequate training in identifying VAK learning modalities and differentiation techniques to ensure effective and consistent implementation. Theoretically, this study reinforces the relevance of differentiated learning theory within the context of economics education in Indonesia, while simultaneously providing an empirical contribution to the development of learning models that are responsive to individual student needs.

Limitation

This study acknowledges several limitations. The research was conducted at a single school, namely SMAN 5 Cirebon, and therefore generalizing the findings to other school contexts should be approached with caution. Furthermore, the implementation of differentiation continued to face constraints related to limited instructional time and the complexity of classroom management, which potentially affected the consistency of its application in practice. The identification of learning styles based on VAK modalities, which served as the foundation for differentiation, also does not fully capture the entire complexity of students' learning needs.

Future Research

Based on these limitations, several directions for future research may be considered. Similar studies should be conducted across schools with diverse social, economic, and geographical characteristics to examine the generalizability of these findings. Longitudinal research is also needed to evaluate the sustainability of improvements in student academic achievement following the consistent application of the differentiated

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model. Additionally, exploration of more comprehensive instruments for identifying student learning needs—extending beyond the VAK modality approach—could strengthen the basis for designing more targeted differentiation strategies. Collaborative research among teachers across subject areas also holds potential for generating more time- and resource-efficient models of differentiation implementation in the classroom.

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