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The Effectiveness of Differentiated Instruction Modules in Enhancing Sociology Learning Outcomes among Eleventh-Grade Students under the Merdeka Curriculum

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Abstract

Objective: Uniform teaching ignores students' readiness, interests, and learning styles, resulting in suboptimal outcomes. To address diverse needs, differentiated learning adapts process, content, and product. This study aims to evaluate the implementation of differentiated learning in improving students' knowledge, attitudes, and skills. **Theoretical framework**: Three cycles of the Classroom Action Research (CAR) technique, which is based on the Kemmis & McTaggart model, were utilised in this study. Each cycle had the following stages: planning, action implementation, observation, and reflection. The research participants were 36 Grade XI SOSHUM students at Al-Azhar High School in Medan. The instruments used in this study were learning outcome tests for knowledge aspects, observation sheets for attitudes, and performance assessments for skill aspects. **Literature review**: Through differentiated content, method, and product, differentiated education takes into account students' varied learning profiles, interests, and readiness. Differentiated instruction has been shown in earlier research to have a positive impact on student learning outcomes. The application of varied teaching modules to enhance students' sociology knowledge, attitudes, and abilities is examined in this study. **Method**: The data were analyzed qualitatively and quantitatively to determine the improvement in the students' average learning outcomes. The research method used a differentiated learning approach through content, process, and product. This method was adapted to the students' learning styles (visual, auditory, and kinesthetic), as well as their interests and readiness. The study's findings demonstrate an improvement in students' learning outcomes in three areas, including knowledge. **Results**: In cycle I, students' average score was 71, which fell short of the required minimum. The average score increased to 85 in cycle II and 93 in cycle III. The average attitude score increased from 68 in cycle I to 87 in cycle II and 97 in cycle III. The average skill score increased from 70 in cycle I to 89 in cycle II and 96 in cycle III. Differentiated instruction can enhance students' cognitive, emotional, and psychomotor learning outcomes. **Implications**: The implementation of differentiated teaching modules can be a solution to overcome low learning outcomes by emphasizing readiness, interest, and learning styles, which is in line with Carol Ann Tomlinson's view. **Novelty**: The use of differentiated teaching modules that incorporate students' readiness, interests, and learning profiles through differentiated content, methods, and results in sociology learning is what makes this study interesting.

Keywords: differentiated learning, learning modules, learning outcomes, sociology, merdeka curriculum

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INTRODUCTION

Education plays a central role in shaping individuals who have character, knowledge, and the ability to adapt to changing times. Ki Hadjar Dewantara stated that true education should guide children to grow according to their natural disposition and the character of their era. This means that education is not just focused on academic results, but also on developing individual potential so they have critical, creative, and collaborative thinking skills needed in the 21st century. Therefore, the national education system must constantly transform to produce a generation that is independent, innovative, and highly competitive in facing global dynamics [1].

The Merdeka Curriculum is a cutting-edge approach to education that aims to make learning more adaptable, contextual, and pertinent to students' needs. In accordance with Regulation Number 12 of 2024 of the Ministry of Education, Culture, Research, and Technology, this curriculum will be implemented nationwide starting from the 2024/2025 school year across all education levels. Differentiated learning, a strategy that modifies the learning process, material, and products based on students' readiness, interests, and learning profiles, is one of the primary approaches of the Merdeka Curriculum. Through this approach, every student gets the chance to learn according to their abilities and achieve optimal learning outcomes [2].

In 11th-grade Sociology, students are required to understand abstract concepts and relate them to social phenomena around them. However, observations show that some students are still passive, have difficulty understanding basic concepts, and struggle to think critically about social issues. This is due to teaching methods that are still uniform and have not taken into account differences in students' learning styles. Differentiated learning modules are one alternative that can be used. Differentiated learning is a technique that makes learning more relevant for each student by tailoring the process, content, and learning outcomes to their interests and readiness [1], [2].

Differentiated learning modules serve as guidelines containing learning objectives, activity steps, and assessment tools tailored to students' needs. The use of these modules enables teachers to design learning activities that are varied, engaging, and relevant to the social context being studied. This strategy is expected to increase student engagement and foster motivation to learn. However, its implementation still faces challenges in the field, such as limited time, resources, and teachers' understanding of the principles of differentiated instruction. Some teachers also have difficulty grouping students based on their learning profiles, interests, and ability levels, so systematic training and support are needed for this strategy to be implemented effectively [3].

Careful preparation, ongoing evaluation, and teachers' capacity to meet the various learning requirements of their pupils are all essential to the success of differentiated instruction. Effective differentiation takes into account students' readiness, interests, and learning profiles to produce meaningful learning experiences. As a result, differentiated teaching modules can operate as useful manuals for applying these ideas methodically in the classroom. Differentiated instruction in sociology gives students the chance to investigate social phenomena through a variety of learning tools and exercises, such as case studies, group discussions, and audiovisual materials. These exercises can foster teamwork, critical thinking, and active engagement while assisting students in comprehending social topics in practical settings. Therefore, the development of students' knowledge, attitudes, and abilities may be aided by differentiated instruction [4], [5].

Through preparation, action, observation, and reflection, classroom action research offers a methodical way to enhance teaching methods. Teachers can assess students' progress and modify their teaching methods as needed by using varied teaching modules over the course of several cycles. In order to enhance the knowledge, attitudes, and skills of Grade XI

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students at SMA Al-Azhar Medan, this study looks into the use of diversified teaching modules [6].

Differentiated instruction has the potential to significantly increase student learning outcomes, according to prior research, particularly in the subject of Sociology. Studies conducted by [7] and [8] confirm that the effectiveness of this approach depends heavily on teachers' ability to understand student characteristics and adapt appropriate instructional strategies. Therefore, the implementation of differentiated learning modules in the Merdeka Curriculum is a strategic step toward improving the quality of adaptive and inclusive learning. With optimal implementation, it is hoped that students will be able to gain a deep understanding of social concepts and be prepared to face the challenges of 21st-century society.

Despite this growing evidence, earlier studies have largely examined differentiated instruction in general terms, in primary education, or from the perspective of implementation difficulties, while empirical evidence on its use in secondary-level sociology remains limited. Few studies have also tracked cognitive, affective, and psychomotor outcomes simultaneously through iterative classroom action research. The novelty of this study lies in the use of differentiated teaching modules that integrate students' readiness, interests, and learning profiles through differentiated content, process, and product in Grade XI sociology learning, particularly on social conflict. Rather than treating differentiation as a set of scattered strategies, this study embeds it in a systematic module and refines it across three Kemmis and McTaggart cycles, so that improvement in knowledge, attitudes, and skills can be documented progressively. This study therefore addresses the need for evidence on how modules work in real classrooms [9], [10].

The findings carry several implications. Theoretically, they provide empirical support for Tomlinson's framework of differentiated instruction in an Indonesian sociology classroom. Practically, the modules offer teachers a ready-to-use guide for designing varied, engaging, and contextual learning activities, thereby easing the difficulties of grouping students and planning instruction. For schools and policymakers, the results highlight the need for systematic training and support so that differentiated learning in the Merdeka Curriculum can be implemented effectively, inclusively, and sustainably. Ultimately, this study contributes a replicable model showing that systematically differentiated modules can transform uniform teaching into adaptive learning, narrowing learning gaps while strengthening students' knowledge, attitudes, and skills for the demands of the twenty-first century.

LITERATURE REVIEW

Instructional Module

An instructional module is a systematically organized learning resource designed to serve as a guide for independent learning [11], explains that learning strategies involve a general pattern of teacher and student activities designed to realize the learning process and achieve predetermined instructional objectives [12] states that a module combines content, methods, and assessment to achieve comprehensive competencies [13] emphasizes that a module contains content, objectives, self-directed learning instructions, and practice exercises [14] adds that a module must include competency standards, be presented in an easy-to-understand manner, be complete with examples, and be organized in a step-by-step manner so as not to overwhelm students. The goal is for students to be able to learn independently without relying entirely on the teacher. The advantage of modules is that they can adapt the material to students' needs and serve as a learning guide. Furthermore, emphasize that modules are essentially designed to enable students to learn independently [15].

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Differentiated Instruction

According to [16], differentiated instruction is the adaptation of learning based on three aspects of student diversity: readiness to learn, interests, and learning styles (visual, auditory, kinesthetic). These adjustments are made to three components of learning: content (the material being studied), process (how students understand the material through tiered activities), and product (how students demonstrate their understanding). The core of this approach is to provide responses tailored to each student's learning needs so that learning is effective.

Learning Outcomes

Learning outcomes are a measure of learning success in the form of relatively permanent behavioral changes [17] states that learning outcomes are observable and measurable behavioral changes in the form of knowledge, attitudes, and skills; [18] views them as the result of students' interactions with their learning environment, as well as emphasize that learning outcomes encompass changes in the do ins of knowledge, attitudes, and skills resulting from planned learning activities. In line with this, [19] and [20] conclude that learning outcomes are a combination of students' learning activities and the quality of instruction provided by teachers.

The Merdeka Curriculum

The Merdeka Curriculum was developed as part of the Indonesian government's efforts to address the learning crisis, which was exacerbated by the COVID-19 pandemic and resulted in learning loss and widening learning gaps [21]. Compared with the 2013 Curriculum, the Merdeka Curriculum places greater emphasis on essential learning content, flexibility, and the development of students' competencies and character. It provides teachers with greater flexibility to adapt learning to students' needs, the characteristics of the educational unit, and the local context. The curriculum also emphasizes meaningful and effective learning, character development, and the development of students as lifelong learners with Pancasila character [22].

METHODOLOGY

The Classroom Action Research (CAR) method used in this study aims to address classroom issues and improve the quality of teaching through reflection and collaboration. This study took place at Al-Azhar High School in Medan and involved 11th-grade students during the 2024–2025 school year. It is stated that CAR consists of four recurring stages: planning, action, observation, and reflection [23]. These stages work together to create a process of continuous improvement states that CAR has three main components: research, action, and the classroom [24]. This indicates that CAR is not merely theoretical but rather a pragmatic methodology centered on classroom realities 1. Types and sources of data. Researchers obtain two types of information: quantitative and qualitative. Quantitative data is derived from students' test scores and analyzed descriptively to determine average scores and proficiency levels. Qualitative data includes written notes on how well students understand, feel, and participate in the learning process. Combining these two types of data provides a comprehensive picture of how well students are learning and how effectively the differentiated learning modules are working. m2. Research and Data Collection Tools: Tests, observation sheets, and documentation are the primary tools used in this study to collect data [25].

Written tests use multiple-choice or essay questions to assess how much students know. Oral tests assess how well students can communicate and understand concepts. Performance tests assess how well students can perform a task in a simulation or group project. Observation sheets are used to track what happens in the classroom, how engaged students

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are, and how effectively differentiated instruction is implemented. Documentation, as proposed by [26], includes photographs, lesson plans, student work, and reflective notes, which serve as evidence supporting the learning process. 3. Methods for Analyzing Data: Quantitative and qualitative methods are used to analyze the data. Descriptive statistical methods are used to process quantitative data and determine average scores, mastery rates, and improvements across cycles. Qualitative data collected through observation and documentation are analyzed descriptively by identifying recurring themes and patterns in student behavior, motivation, and participation [27], [28].

This combination ensures that all aspects of learning outcomes and classroom interactions are taken into account. 4. The Cycle of Classroom Action Research (CAR) CAR is carried out in four recurring stages, creating a cycle of reflection and improvement: Planning involves identifying existing problems in the classroom and preparing by developing lesson plans, instructional materials, and teaching resources. Action: implementing the lesson plan through various teaching methods. Observation: monitoring student responses, levels of student engagement, and the success of learning. Reflection: reviewing the collected data to assess the effectiveness of the actions taken and revising the plan for the next cycle. This cyclical process ensures that each stage builds upon the previous one, allowing teachers to continuously improve their teaching methods to help students further their understanding of sociology [29], [30].

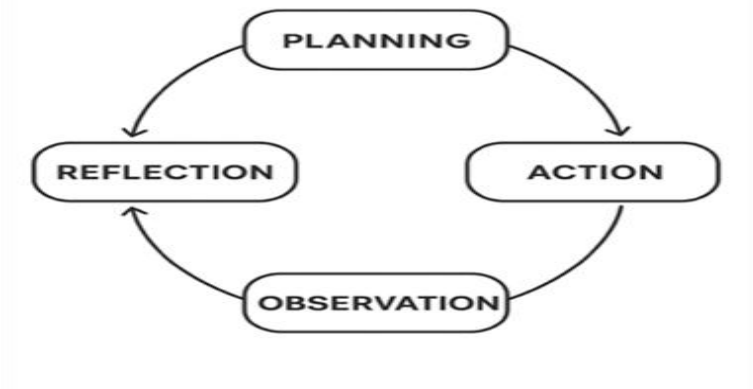


Figure 1. The Classroom Action Research (CAR) Cycle. The figure below illustrates the four steps of Classroom Action Research: Planning, Action, Observation, and Reflection

Figure 1 presents the Classroom Action Research (CAR) cycle adopted in this study, following the Kemmis and McTaggart model. The cycle begins with planning, in which the teacher identifies classroom problems and prepares differentiated teaching modules, instructional materials, and assessment instruments. In the action stage, the planned modules are implemented through differentiated content, process, and product that respond to students' readiness, interests, and learning profiles. Observation follows, during which the researcher and collaborating teacher monitor student engagement, participation, and learning progress using tests, observation sheets, and documentation. The cycle closes with reflection, where the collected data are analyzed to evaluate the effectiveness of the action and to identify weaknesses. The arrows indicate that reflection feeds directly into the next planning stage, so each cycle builds on the previous one. In this study, the process was repeated three times to achieve continuous improvement in learning outcomes [31].

These steps are organized in a continuous cycle. Each stage influences the next, creating a cycle of improvement in which teachers identify problems, take action, observe the results, and consider how to make changes for the next cycle. This iterative model emphasizes the importance of continually reflecting on one's work and improving the quality of instruction. Criteria for the Success of the Intervention. Based on the Minimum Competency Criteria of 75, the improvement in the learning outcomes of 11th-grade social sciences students in the

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subject of social conflict determines the effectiveness of classroom activities. Learning achievements are divided into several levels of mastery: very good, good, sufficient, insufficient, and very insufficient, according to Sudjiono. Teachers can use these levels to measure how well students meet the learning objectives. In addition, every school is required to set its own MLC for each topic in accordance with the Educational Assessment Standards [32]. Students are considered individually competent if they meet or exceed these criteria.

Table 1. The Criteria and Proficiency Categories Used in this Study

Score Range	Grade	Mastery Category	Description
92–100	Excellent	Mastered	Very high level of competency; able to analyze and evaluate.
84–91	Good	Mastered	Good level of competency with only a few minor errors.
75–83	Fair	Mastered	Has achieved the minimum standard (KKM), but still needs further reinforcement.
66–74	Poor	Not Mastered	Has not yet achieved the minimum standard; demonstrates low mastery of the material and needs remedial learning.
≤65	Very Poor	Not Mastered	Far below the minimum standard; requires intensive guidance and repeated remedial learning.

$$\bar{X} = \frac{\Sigma X}{N} 100$$

Note:
$\bar{X}$: Average
Σ: Total number of students
N: Number of students

Table 1 presents the criteria and proficiency categories used to interpret students' learning outcomes across the three cycles. Scores are classified into five grade levels: excellent (92–100), good (84–91), fair (75–83), poor (66–74), and very poor (≤65). These levels are grouped into two mastery categories. Students who obtain scores of 75 or above are categorized as having mastered the material, whereas those who score below 75 are considered not yet mastered. The threshold of 75 corresponds to the Minimum Competency Criteria (KKM) set by the school for the topic of social conflict.

Each level carries a specific descriptor. The excellent category reflects a very high level of competency, in which students are able to analyze and evaluate social phenomena. The good category indicates strong understanding with only minor errors, while the fair category shows that students have reached the minimum standard but still need further reinforcement. In contrast, the poor category indicates low mastery and a need for remedial learning, and the very poor category signals performance far below the standard that requires intensive guidance and repeated remedial teaching.

The average score of each cycle was calculated using the formula shown below the table, where the total score of all students is divided by the number of students. The resulting mean was compared with these criteria to determine whether the intervention was effective and whether the next cycle was necessary, ensuring objective evaluation.

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RESULTS AND DISCUSSION

To enhance the learning outcomes of students studying social conflict through varied teaching methods, this classroom action research was conducted in the 11th-grade Social Sciences class at Al-Azhar High School in Medan. Focusing on the differentiation of content, process, and products based on students' readiness levels, interests, and learning profiles (visual, auditory, and kinesthetic), this strategy was implemented over three cycles. The results showed steady and significant progress over the three cycles across all three learning domains: psychomotor (skills), emotional (attitudes), and cognitive (knowledge). The average score for the knowledge component in Cycle I was 71, falling short of the Minimum Proficiency Criteria of 75 points. The scores for attitudes and skills were 68 and 70, respectively. Participation was poor; students appeared unmotivated and had not yet adapted to the new method. Student performance improved significantly throughout Cycle II, as evidenced by an increase in the average knowledge score to 85, the attitude score to 87, and the skills score to 89.

This progress resulted from the instructor refining the differentiation process by modifying learning activities to better suit the students' learning profiles and readiness. Student motivation to learn, cooperation, and engagement all increased. With average scores of 93, 97, and 96 in knowledge, attitude, and competence, respectively, in Cycle III, students demonstrated significant mastery. Every student exceeded the minimum passing score, indicating overall learning success. In group projects and product-based learning activities, students demonstrated improved understanding, self-confidence, and accountability. Differentiated instruction has been shown to improve students' overall behavioral and academic outcomes [16].

Individual differences in readiness, interests, and learning styles can be effectively addressed through diverse instructional approaches, according to the overall findings. Carol Ann Tomlinson's thesis, which emphasizes that students learn best when teachers tailor instruction to individual needs, is substantially supported by these results. Deeper conceptual understanding is made possible by diverse content and processes, as evidenced by the steady improvement in the cognitive domain from Cycle I to Cycle III. Learning gaps can be addressed, and abstract topics such as social conflict can be mastered by tailoring activities and materials to students' abilities. This study found that students' motivation, discipline, and teamwork improved significantly in the affective domain. Learning activities aligned with students' interests increased student engagement and created a welcoming and inclusive learning environment. This supports Tomlinson's assertion that focusing on students' interests enhances engagement and fosters a positive attitude toward learning [33], [34].

Differentiated instruction encourages students to express their understanding in the psychomotor domain through creative works aligned with their learning preferences, such as role-playing exercises and digital posters. These techniques enhance students' self-confidence, communication skills, and teamwork. Students' academic achievement and personal development continue to improve thanks to the contribution of diverse learning approaches to a more inclusive, engaging, and student-centered learning environment. Research findings indicate that all students can make meaningful progress in line with their potential when education is tailored to their readiness, interests, and learning profiles [35], [36].

Student learning outcomes continued to improve across all cycles, according to the data. Students were still adapting to various learning strategies in Cycle I, as evidenced by average scores that remained below the Minimum Proficiency Criteria. Knowledge, attitudes, and skills improved significantly in Cycle II, indicating increased understanding and engagement. All students in Cycle III achieved a level of mastery above the KKM, demonstrating how effective diverse learning approaches are in improving students' cognitive, emotional, and psychomotor learning outcomes.

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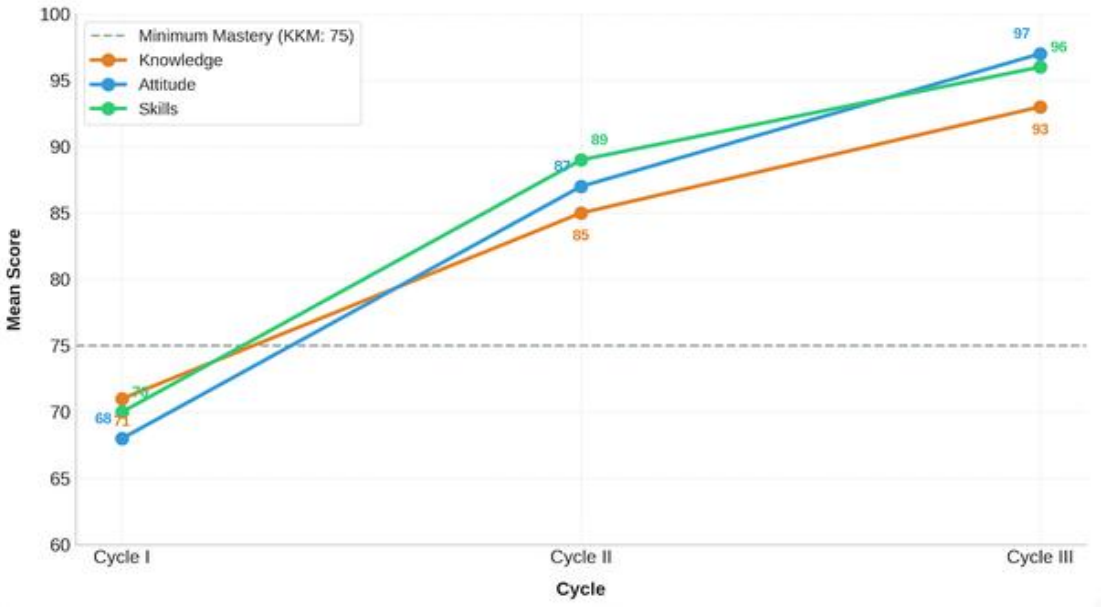


Figure 2. Enhancement of Learning Outcomes for Students Every Cycle

Figure 2 illustrates the improvement in students' mean scores across the three cycles in the knowledge, attitude, and skills domains, with the dashed line representing the minimum mastery criterion (KKM) of 75. In Cycle I, all domains remained below the KKM, with scores of 71 for knowledge, 68 for attitude, and 70 for skills. Substantial gains occurred in Cycle II, when scores rose to 85, 87, and 89, respectively, surpassing the criterion. By Cycle III, knowledge reached 93, skills 96, and attitude 97, the highest among the three. These consistent upward trends indicate that refining differentiated teaching modules through reflection in each cycle effectively strengthened students' cognitive, affective, and psychomotor outcomes [16].

The results of this study provide strong support for Carol Ann Tomlinson's theory of differentiated instruction, which states that proactively adapting instruction to students' diverse learning profiles, interests, and readiness leads to effective teaching. When instructional design is tailored to the unique needs of each student, differentiation enables all students to reach their full potential, as evidenced by the progressive improvement observed across the three learning cycles [37].

Students' knowledge scores in the cognitive domain increased from 71 in Cycle I to 93 in Cycle III. This increase aligns with Tomlinson's theory that diversifying topics allows teachers to provide assignments and materials appropriate to students' readiness levels. Abstract sociological concepts, including social conflict and its causes, become more meaningful and accessible when instructional materials are modified to suit students' cognitive levels and learning preferences. As a result, students achieve better conceptual mastery and understanding. Students' attitudes toward learning improved from 68 in Cycle I to 97 in Cycle III in the affective dimension. This supports Tomlinson's assertion that student motivation and engagement naturally increase when education is linked to students' interests. A healthy classroom atmosphere was fostered through various activities, such as group discussions, reflective assignments, and contextual examples. Students developed key affective indicators highlighted in Tomlinson's differentiation framework: empathy, responsibility, and teamwork [38], [39].

Over the course of three cycles, students' psychomotor skills improved from 70 to 96. According to Tomlinson, children can demonstrate understanding in ways that align with their learning profiles (visual, auditory, or kinesthetic) when the process and the outcome are distinguished. Students were able to apply information through relevant hands-on experiences by working on creative projects, including digital posters, skits, and group

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presentations. Tomlinson's theory that differentiated instruction offers "diverse ways of learning" that respect each student's preferences and talents is reflected in this approach. All things considered, this conversation supports Tomlinson's theory that the best learning environment is one that recognizes and accommodates student diversity. This study offers empirical evidence that diverse education fosters students' self-confidence, sense of social responsibility, and love of learning, in addition to improving academic achievement. Therefore, differentiation should be viewed as an inclusive, learner-centered pedagogical approach, rather than merely a collection of tactics [40], [41].

A closer analysis of the data reveals distinct patterns across the three domains. The largest gains occurred between Cycle I and Cycle II, with increases of 14 points in knowledge, 19 in attitudes, and 19 in skills. Gains in Cycle III were smaller, at 8, 10, and 7 points, respectively, suggesting that the intervention stabilized as teachers refined the modules. Cumulatively, attitudes improved the most (29 points), followed by skills (26) and knowledge (22). Notably, attitudes began as the lowest domain yet ended as the highest, indicating that interest-based and collaborative activities strongly and positively influenced student motivation, engagement, and responsibility throughout the learning process.

These patterns imply that early cycles served as an adaptation phase, in which students and the teacher adjusted to unfamiliar learning routines. Reflection after each cycle allowed grouping, tasks, and products to be aligned more accurately with students' readiness and profiles, consistent with Tomlinson's emphasis on continuous formative assessment. However, several limitations should be acknowledged. The study involved one class in a single school without a control group, and the absence of comparison means improvement cannot be attributed solely to differentiation. Teacher familiarity and repeated assessment may also have contributed. Attitude scores derived from observation sheets may also involve observer subjectivity, so triangulation across several observers would strengthen validity. Therefore, the findings should be interpreted cautiously, and future research should employ comparative designs with larger, more diverse samples.

CONCLUSION

The implementation of differentiated instruction significantly improved the learning outcomes of 11th-grade social studies students at Al Azhar High School in Medan across three domains: knowledge, attitudes, and skills, according to this three-cycle classroom action research. Students demonstrated steady progress across the cycles in the knowledge domain. In Cycle I, the average score was 71; in Cycle II, it increased to 85; and in Cycle III, it reached 93. These results indicate that differentiated instruction can significantly improve conceptual understanding and academic achievement when aligned with students' readiness levels and learning profiles. Students' average scores in the attitude domain increased from 68 in Cycle I to 87 in Cycle II, and then to 97 in Cycle III. These encouraging results show that differentiated instruction fosters motivation, engagement, and responsibility, in addition to impacting cognitive development. Furthermore, differentiated instruction helps create a welcoming and inclusive classroom environment where students are actively engaged and value diversity in learning. With an increase in the average score from 70 in Cycle I to 89 in Cycle II and 96 in Cycle III, student performance in the skills domain also improved significantly. These results demonstrate how students can develop practical skills and teamwork in accordance with their unique learning styles and potential through differentiation in content, procedures, and products. All things considered, the findings of this study support Carol Ann Tomlinson's theory of differentiated instruction, which states that effective teaching is based on the idea that students learn best when teachers tailor methods, materials, and learning outcomes to students' learning profiles, interests, and readiness. Teachers can design flexible, student-centered, and interactive learning environments that support each student's optimal growth and success by implementing differentiation methodically and carefully.

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Author Contribution

Sri Wulandari conceptualized the study, conducted the classroom action research, collected and analyzed the data, and drafted the manuscript. Saliman and Agustina supervised the research, provided guidance, reviewed the manuscript, and approved the final version.

Conflicts of Interest

The authors declare no conflicts of interest regarding this study. No financial, personal, or professional relationships influenced the research design, data analysis, interpretation of results, or the preparation and publication of this manuscript.

Use of Artificial Intelligence (AI)

The authors used artificial intelligence tools only to assist with language refinement and editing. All intellectual content, interpretation, analysis, and final decisions remain the responsibility of the authors themselves.

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