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THE INFLUENCE OF LEARNING STYLES AND MOTIVATION OF CLASS XI STUDENTS ON THE EFFECTIVENESS OF DIFFERENTIATED GEOGRAPHY LEARNING AT SMA NEGERI 3 HALMAHERA UTARA, INDONESIA

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ABSTRACT

This study analyzes the influence of students' learning styles and learning motivation on the effectiveness of differentiated Geography learning at SMA Negeri 3 Halmahera Utara. This study is based on the importance of differentiated learning in accommodating students' learning characteristics in the context of an archipelago with diverse geographical conditions. A quantitative approach with an explanatory method was used involving 61 students. Data were collected through a closed questionnaire through validity and reliability tests. Data analysis used a t-test. The results showed that learning styles have a significant influence on the effectiveness of differentiated learning, with a t-value of 10.786 and a learning motivation t-value of 7.228, with a coefficient of determination of 47.0%. These findings confirm that differentiated learning based on student characteristics and local environmental conditions increases student engagement, learning effectiveness, and contextual relevance in Geography education.

A. INTRODUCTION

Differentiated learning is increasingly relevant in preparing the younger generation to have collaboraive, communicative, critical and creative skills. (Silmi et al., 2025). This approach allows students to develop their learning potential according to their individual characteristics, needs, and abilities. In geography learning, the application of differentiation is important because geography emphasizes not only conceptual mastery but also spatial thinking skills, geographic literacy, and an understanding of the relationship between humans and the environment (Rahmi & Jannah, 2024). Therefore, learning strategies need to be adapted to the diversity of students' learning styles so that the Geography learning process is more effective, contextual, and meaningful for students.

However, the implementation of differentiated learning in North Halmahera Regency still faces various challenges, especially in terms of human resources, educational infrastructure, and limited access to technology and information (Suhendra et al., 2024). This condition is reinforced by the socio-cultural characteristics of local communities which require adjustments to learning strategies to be more contextual and appropriate to students' learning experiences. Based on the results of initial observations at SMA

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Negeri 3 Halmahera Utara, it was found that students have diverse learning styles that require the application of more adaptive and varied learning strategies, as indicated by some students who do not understand the material when learning is only delivered through lecture methods.

In addition, the geographical conditions of the Halmahera archipelago region, which is relatively far from learning resource centers, results in limited access to media and supporting learning resources (Lating et al., 2022). Limited teacher professional development is also an obstacle in implementing optimal differentiated learning, especially in designing Geography learning that can accommodate students' learning needs comprehensively. This condition is in line with research (Grecu, 2023) which states that the success of differentiated learning is greatly influenced by the teacher's ability to map student characteristics and provide appropriate learning resources in the learning differentiation process.

In this effort, the implementation of differentiated learning in geography lessons needs to be adapted to learning styles. Students with visual learning styles can be facilitated through the use of maps, infographics, videos, and regional imagery (Sahiti & Stamp, 2022), whereas auditory students are more helped through discussions, presentations and oral explanations (Adeoye & Prastikawati, 2025). Meanwhile, kinesthetic students need practical activities, environmental observations, and field activities to understand geographical phenomena in real terms (Nafratilova et al., 2025).

This approach is in line with research (Riyanawati et al., 2025) This shows that learning strategies tailored to students' characteristics and learning styles can significantly increase engagement, motivation, and learning outcomes. In geography learning, these strategy adjustments also contribute to improved spatial thinking skills and students' understanding of spatial phenomena in a more contextual way.

In addition to considering learning styles, students' motivation also needs to be strengthened through contextual learning that links geography material to local environmental conditions in North Halmahera. This approach aligns with the characteristics of high school students, who are in the adolescent psychological development phase, characterized by increased curiosity, a need for self-recognition, abstract thinking skills, and a tendency to learn through experience and social interaction (Suherlin et al., 2024). Therefore, Geography learning that provides opportunities for students to learn according to their characteristics and needs can increase participation, learning motivation, spatial thinking skills, and students' understanding of geographical phenomena in a more meaningful and contextual way.

The implementation of differentiated learning in Geography learning is in line with constructivism theory which emphasizes the formation of knowledge through contextual and meaningful learning experiences (Salsabila & Muqowim, 2024). Geography learning is not only oriented towards mastering spatial concepts, but also towards the ability to critically understand the relationship between humans, the environment and regions (Elang et al., 2023). The geographical conditions of Halmahera Utara Regency, which are dominated by coastal areas, hills, agriculture, and socio-cultural diversity, can be used as a contextual learning resource to connect material with students' daily lives (Kailola, 2024). The application of differentiated learning through environmental observation, discussions of regional phenomena, map analysis, and local case studies can encourage spatial thinking skills, geographic literacy, and active student engagement in the learning process. These findings are supported by previous research showing that environment-based geography learning and collaborative activities effectively improve students' conceptual understanding, spatial thinking skills, and geographic literacy (Mathews et al., 2023; Ardiansyah et al., 2024).

This study aims to analyze the influence of learning styles and learning motivation of eleventh-grade students on the effectiveness of differentiated learning in Geography subjects at SMA Negeri 3 Halmahera Utara. The novelty of this study lies in the study of the relationship between learning styles and learning motivation in the context of Geography learning in an archipelagic region, which places the geographical characteristics of Maluku utara as an important part in the implementation of differentiated learning. In contrast to previous studies that were generally conducted in a general context, this study emphasizes a contextual learning approach according to the conditions of the archipelagic region. The results of this study are expected to provide theoretical contributions in the development of differentiated learning studies in Geography education, as well as practical contributions for teachers and educational stakeholders in designing learning that is more contextual, inclusive, and appropriate to the characteristics of students in eastern Indonesia.

B. METHOD

The study used a quantitative approach with a correlational design. This correlational design was chosen to determine the level of relationship and influence between variables without manipulating the independent variable. The purpose of this study was to determine the influence of learning styles and motivation of eleventh-grade students on the effectiveness of differentiated learning

in Geography at SMA Negeri 3 Halmahera Utara. The variables in this study consisted of the dependent variable, the effectiveness of differentiated learning (Y), and the independent variables, student learning styles (X_1) and learning motivation (X_2).

The study was conducted at SMA Negeri 3 Halmahera Utara, located on Jalan Trans Halmahera Utara, Goruang Village, Kao District, Halmahera Utara Regency. The subjects were 61 eleventh-grade students. Data were collected through observation, questionnaires, and documentation. A closed-ended questionnaire was used to measure learning styles, learning motivation, and students' perceptions of the effectiveness of differentiated learning. The instrument consisted of 15 items using a 5-point Likert scale, categorized according to the following table.

Table 1. Likert Scale Categories

Scale	Category
5	Strongly Agree
4	Agree
3	Neutral/Undecided
2	Disagree
1	Strongly Disagree

(Source: Hidayati & Rachmadiarti, 2024)

The closed-ended questionnaire instrument was first tested for validity and reliability to ensure the accuracy and consistency of the data obtained. The results of the instrument's validity and reliability testing are presented in the following table.

Table 2. Results of the Validity and Reliability Test of the Questionnaire

Validity Test			
Variabel	**Method**	**Results**	**Information**
Learning Styles Learning Motivation Differentiated Learning	Product-Moment Correlation	Valid Questions (15)	Rxy > rtabel (0.254)
Reliability Test			
Learning Styles	Cronbach's Alpha	0.910	Reliabel (> 0.70)
Learning Motivation		0.908	
Differentiated Learning		0.925	

(Source: Research data results, 2025)

Data analysis using t-tests and f-tests determined whether the independent variables simultaneously and partially significantly influenced the dependent variable. The research hypothesis included the null hypothesis (H_0) which stated that students' learning styles and motivation did not influence differentiation learning. Meanwhile, the alternative hypothesis (H1) stated that students' learning styles and motivation influenced differentiation learning.

C. RESULT AND DISCUSSION

C.1. RESULT

This study aims to determine the influence of learning styles and learning motivation of eleventh-grade students on the effectiveness of differentiated learning in Geography at SMA Negeri 3 Halmahera Utara. The learning focus is directed at Population material linked to a contextual learning approach based on social and regional conditions in North Halmahera. In its implementation, differentiated learning is carried out by adjusting the characteristics of students' learning styles, both visual, auditory, and kinesthetic, so that students gain a more meaningful learning experience according to the needs and potential of each student.

Population topics are not only studied theoretically but also connected to real-world phenomena in the surrounding environment, such as population distribution, community mobility, settlement growth, and the socio-economic dynamics of coastal and rural communities in North Halmahera. This contextual approach helps students understand that population concepts are directly related to daily life and the conditions in their residential areas.

The results of classroom research indicate that students with high learning motivation tend to be more active in the differentiated learning process, are able to participate in group discussions, and more easily understand population material through observation and analysis of local phenomena. Students with visual learning styles more easily understand material through the use of population distribution maps, infographics, and learning videos, while auditory students show better understanding through discussions, presentations, and verbal explanations from the teacher. Meanwhile, kinesthetic students are more enthusiastic when learning is carried out through observations of the surrounding environment, regional case studies, and simple project activities related to population conditions in their area. These conditions indicate that the implementation of differentiated learning can increase student engagement, learning interactions, and the overall effectiveness of Geography learning. The findings of this study are in line with research (Faradiba et al., 2026) which states that learning styles and learning motivation are important

factors that influence the success of differentiated learning.

The research findings are supported by empirical data and field observations presented systematically. Before testing the hypotheses, prerequisite tests were conducted to ensure the data met statistical assumptions and were suitable for analysis using multiple linear regression.

a. Normality Test: Based on the significance values (Asymp. Sig. 2-tailed) for the learning style variable (X1 = 0.083), the learning motivation variable (X2 = 0.187), and the effectiveness of differentiated learning variable (Y = 0.200), these values were >0.05, thus concluding that the data were normally distributed.
b. Multicollinearity Test: Referring to the Tolerance value of 0.419 > 0.10 and the VIF of 2.385 < 10 for both variables, each variable can be viewed as an independent factor that makes a unique contribution to the effectiveness of differentiated learning at SMA Negeri 3 Halmahera Utara.

Hypothesis testing was conducted using a t-test, with H0 stating there is no significant effect of learning style and student motivation on the effectiveness of differentiated learning in geography, and H1 stating there is a significant effect of learning style and student motivation on the effectiveness of differentiated learning in geography. The results of the hypothesis testing are presented in the following table.

Table 3. t-Test Results

Variables	Unstandardized B	Std. Error	Std. Beta	t	Sig.
Learning Style (X1)	0,798	0,074	0,815	10,786	0,000
Learning Motivation (X2)	0,734	0,102	0,685	7,228	0,000

(Source: Research data results, 2025)

Referring to Table 3 above, the t-test results show that the learning style variable (X1) significantly influences the effectiveness of differentiated learning (Y), with a calculated t-value of 10.786 > 1.976 and a significance level of 0.000 < 0.05. Similarly, the learning motivation variable (X2) also significantly influences the effectiveness of differentiated learning, with a calculated t-value of 7.228 > 1.976 and a significance level of 0.000 < 0.05. Based on the standardized beta value, the learning style variable has the most dominant influence on the effectiveness of differentiated learning compared to learning motivation.

Thus, H1 is accepted, indicating a significant influence of learning style and learning motivation on the effectiveness of differentiated learning in Geography. This finding is supported by classroom learning conditions, which indicate that students are more active and understand the material more easily when learning is tailored to

their learning style characteristics. Students with high learning motivation tend to be more consistent in participating in discussions, completing assignments, and participating throughout the learning process.

Table 4. F-Test Results

Source of Variation	Sum of Square	df	Mean Square	f	Sig.
Regression	5926,765	2	2963,382	65,406	,000
Residual	2627,826	58	45,307		
Total	8554,590	60			

(Source: Research data results, 2025)

Based on Table 4 above, it provides evidence that learning styles and learning motivation simultaneously influence the effectiveness of differentiated Geography learning at SMA Negeri 3 Halmahera Utara. This is evidenced by the F value obtained of 65.406 with a significance level of 0.000 > 0.05.

Table 5. Coefficient of Determination

R	R Square	Adjusted R Square	Std. Error of the Estimate
,685	,470	,461	8,769

(Source: Research data results, 2025)

Based on Table 5, the R-square value is 0.470, indicating that learning style and learning motivation together contribute 47.0% to the effectiveness of differentiated learning in Geography. Meanwhile, 53.0% is influenced by other variables outside the study. This finding indicates that learning style and learning motivation are important factors in supporting the effectiveness of differentiated learning in the classroom.

C.2. DISCUSSION

This study shows that students' learning styles and learning motivation significantly influence the effectiveness of differentiated Geography learning for eleventh-grade students at SMA Negeri 3 Halmahera Utara, contributing 47.0%. These findings indicate that the effectiveness of differentiated learning is influenced by the teacher's ability to adapt learning strategies to students' characteristics and learning motivation. This is seen through student involvement in learning activities according to learning styles, such as field observations, the use of audiovisual media, and map analysis, and is demonstrated by active discussions, accurate assignment submissions, presentation participation, and student involvement in local geographic

phenomenon analysis projects. These contributions have implications for the success of contextual Geography learning according to the conditions of the North Halmahera community.

Geographically, North Halmahera Regency is dominated by island and coastal areas, and the distribution of settlements is uneven (BPS Halmahera Utara, 2025). This has the potential to be used as a contextual learning resource in the subject "Population." This allows students to directly understand the phenomena of population distribution, inter-island community mobility, spatial utilization patterns, and the relationship between population activities and the characteristics of local geographic areas. This has an impact on improving students' geographic skills in identifying, analyzing, and explaining spatial phenomena more systematically. This aligns with Carol Ann Tomlinson's theory of Differentiated Instruction, which emphasizes that effective learning occurs when learning strategies are tailored to students' needs and learning profiles (Kuhr, 2022).

Through this approach, learning styles play a role in determining the effectiveness of receiving and processing contextually-based information, while learning motivation strengthens student engagement in the process of identifying, analyzing, and interpreting population phenomena. Students with visual learning styles more easily understand material through the use of population distribution maps, while auditory students are more active in discussions and presentations related to population issues. On the other hand, kinesthetic students demonstrate better understanding through environmental observation activities and analysis of the social conditions of the surrounding community. High learning motivation also encourages students to be more active in completing assignments, participating in group discussions, and developing analyses of local geographic phenomena (Kamil et al., 2020).

This finding is in line with research (Subandiyah et al., 2025) which states that differentiated learning can increase student engagement and learning outcomes when learning strategies are adapted to the characteristics of students' learning styles and needs. Research (Makinde et al., 2024) also shows that learning motivation influences activeness, critical thinking skills, and the effectiveness of contextual learning, particularly in Geography learning that emphasizes the analysis of social and environmental phenomena. Thus, differentiated learning based on local environmental conditions not only improves conceptual understanding of Geography but also strengthens the relevance of learning to the social realities of the North Halmahera community and encourages the development of students' critical and contextual thinking skills.

The results of the partial t-test show that the learning style variable (X1) has a significant influence on the effectiveness of differentiated Geography learning with a t-value of 10.786 > 1.976 and a significance of 0.000 < 0.05. Similarly, the learning motivation variable (X2) also has a significant influence with a t-value of 7.228 > 1.976 and a significance of 0.000 < 0.05. Based on the standardized beta value, learning style has a more dominant influence (0.815) than learning motivation (0.685) on the effectiveness of differentiated learning. The difference in the strength of this influence shows that adjusting learning strategies to the characteristics of students' learning styles is a major factor in increasing the effectiveness of Geography learning, while learning motivation plays a role in strengthening student involvement and participation during the learning process.

Overall, the findings of this study provide empirical evidence that the effectiveness of differentiated geography learning is influenced not only by the teacher's ability to implement appropriate learning strategies, but also by the suitability of students' learning styles and motivations. Integrating student learning characteristics with internal motivations creates a more effective, active, and contextual learning process (Eufrasio et al., 2023). Students not only receive learning materials, but are also involved in the process of analyzing, interpreting, and solving geographical problems related to the environmental and social conditions of the North Halmahera community. This finding is in line with research (Samawati et al., 2023) which shows that differentiated learning can improve the quality of learning when learning strategies are adapted to students' needs, characteristics, and learning motivation.

The implications of these findings demonstrate the need for teachers and educational policymakers to develop geography instruction that is adaptive to different learning styles and can enhance student motivation. The application of differentiated learning based on local environmental conditions is believed to create more meaningful learning, enhance students' critical and spatial thinking skills, and strengthen the relevance of learning to the social realities of communities in island regions like North Halmahera.

D. CONCLUSION

This comprehensive study demonstrates that students' learning styles and motivation significantly influence the effectiveness of differentiated geography learning at SMA Negeri 3 Halmahera Utara. This finding is supported by quantitative data analysis, based on the results of the partial t-test showing that learning styles significantly influence the effectiveness of differentiation learning. geography learning, with a calculated t-value of 10.786 > 1.976 at a significance level of 0.00 < 0.05. Similarly, learning

motivation has an influence, with a calculated t-value of 7.228 > 1.976 at a significance level of 0.000 < 0.05.

Learning styles demonstrate a more dominant influence than learning motivation, confirming that the appropriateness of learning strategies to students' learning characteristics is a crucial factor in enhancing learning effectiveness. Learning motivation also strengthens student engagement through active participation in discussions, observations, presentations, and analysis of local geographic phenomena. These findings prove that differentiated learning based on local environmental conditions is able to create Geography learning that is more contextual, active, and relevant to the conditions of the island communities in North Halmahera.

Theoretically, this research contributes to strengthening the study of differentiated learning in geography education, particularly in the context of island regions, by emphasizing the importance of integrating learning styles and motivation in creating effective and contextual learning. Practically, the results of this study provide a basis for teachers to develop adaptive learning strategies through the use of visual media, discussions, environmental observations, and analysis of local geographic phenomena.

This research is limited to a single research location and uses a quantitative approach, thus not providing an in-depth description of students' learning experiences. Therefore, future research is recommended to expand the scope of the region, add other variables such as teacher competency and learning media, and use a mixed methods approach to strengthen the study of the implementation of differentiated learning in geography.

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