Study of Geography Teachers' Understanding of Differentiated Instruction in Senior High Schools.docx

by Aliana Hare

Submission date: 16-Jun-2025 04:55AM (UTC-0400)

Submission ID: 2700304891

File name: Study_of_Geography_Teachers_Understanding_of_Differentiated_Instruction_in_Senior_High_Schools.docx (93.66K)

Word count: 5514

Character count: 35600

Al-Ishlah: Jurnal Pendidikan
Vol.XX, X (Month, Year), pp. XX-XX
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v14i1.973

Study of Geography Teachers' Understanding of Differentiated Learning in Senior High Schools

Sugiyanto[1], Rita Noviani[2], Chatarina Muryani[3], Singgih Prihadi[4], Imasti Dhani Pratiwi[5]

[1] Geography Education, Universitas Sebelas Maret, Indonesia; sugiyanto60@staff.uns.ac.id
[2] Geography Education, Universitas Sebelas Maret, Indonesia; ritanoviani@staff.uns.ac.id
[3] Geography Education, Universitas Sebelas Maret, Indonesia; chatarinamuryani@staff.uns.ac.id
[4] Geography Education, Universitas Sebelas Maret, Indonesia; singgihprihadi@staff.uns.ac.id
[5] Geography Education, Universitas Sebelas Maret, Indonesia; imasti.dhani.p@staff.uns.ac.id

ARTICLE INFO

Keywords:

Differentiated Learning;
Geography Teachers;
High Schools;
Merdeka Belajar Curriculum

Article history:

Received YYYY-MM-DD
Revised YYYY-MM-DD
Accepted YYYY-MM-DD

ABSTRACT

This study aims to describe the level of understanding of geography teachers in senior high schools regarding the implementation of differentiated learning in the context of the Merdeka Belajar Curriculum. This study uses a quantitative approach with a descriptive survey method. The data collection instrument consists of an online questionnaire designed based on four dimensions of differentiated instruction: content differentiation, process differentiation, product differentiation, and learning environment differentiation. A total of 59 geography teachers who met the criteria participated as respondents. The data were analyzed using descriptive statistics and hierarchical regression with the assistance of SPSS software. The results of the study indicate that the majority of teachers (66.1%) have a high level of understanding of differentiated learning, while the rest (33.9%) are in the moderate category, and none are in the low category. Although the background as a geography teacher does not significantly affect this understanding, participation in the Merdeka Curriculum training was found to significantly increase teachers' understanding scores. Training contributed 8.3% to the increase in teachers' understanding, while other variables contributed outside this model. These findings emphasize the importance of contextual and continuous professional training to enhance teachers' ability to effectively implement differentiated instruction in geography classrooms. This study provides empirical contributions to the literature on geography education and can serve as a foundation for designing professional development strategies for teachers based on the Merdeka Curriculum.

Corresponding Author:
Sugiyanto
Geography Education, Universitas Sebelas Maret, Indonesia; sugiyanto60@staff.uns.ac.id

1. INTRODUCTION

The implementation of the Merdeka Belajar Curriculum is a significant milestone in the effort to transform Indonesia's education system (Ariga, 2023). This curriculum is designed to promote more flexible, relevant, and learner-centered learning, emphasizing the development of individual potential through greater autonomy for educational institutions (Wahyudin et al., 2024). The goal is to create a learning environment that is adaptive to the diverse needs of students, thereby producing a generation with holistic competencies and the ability to face the challenges of the times (Susilawati & Juanda, 2023). In this context, the subject of Geography plays a crucial role. Geography not only equips students with an understanding of physical and social phenomena on the Earth's surface but also cultivates spatial awareness, critical thinking skills, and the ability to analysis geographical data (Béneker, Bladh, & Lambert, 2024). This understanding is essential for shaping adaptive, responsible citizens who can contribute to sustainable development (Simm & and Marvell, 2017).

This is certainly true, as geography education in high schools generally still uses a "one-size-fits-all" approach, which is no longer adequate in an era of student diversity (based on ability, interests, and learning styles) (Purwowidodo & Zaini, 2023). Therefore, optimizing geography education through differentiated instruction aligns with the spirit of the Merdeka Belajar Curriculum. The implementation of differentiated instruction has been proven to enhance student motivation and learning outcomes; however, many geography teachers have not yet implemented it optimally, despite understanding the concept of differentiated instruction (Ismajli & Imami-Morina, 2018). Challenges such as mindset, time constraints, teaching materials, and school management support remain major obstacles. In the context of geography learning, which is a subject based on spatial, environmental, and socio-cultural aspects, the application of differentiated learning should be an opportunity to ground teaching materials that are relevant, contextual, and meaningful to students (Silviariza, Sumarmi, & Handoyo, 2020).

However, various studies show that teachers' understanding of the concepts and practices of differentiated learning still varies, and the results of its implementation in the field have not been optimal. The findings of Widanti, Rindawati, Muzayanah, & Chanthoeurn (2023), conclude that the implementation of differentiated instruction in the classroom, specifically in teaching essential anthroposphere geography content at SMAN 4 Sidoarjo, has significantly improved the application of differentiated instruction in terms of content, process, and outcomes, thereby enhancing student learning activities and academic achievements. Additionally, based on the research data from Akhiruddin, Bashori, & Pasiamping (2024), it was shown that differentiated instruction significantly improved students' motivation and learning outcomes in geography (t-value = 0.000, with the experimental class average at 78.09 compared to the control class average at 69.17). Meanwhile, the research findings of Isromi, Malik, & Maru (2022), indicate that the development of character-based student worksheets (LKS) in online geography learning is highly valid (90–95% according to validators) and practical (91% teacher response and 86% student response). This illustrates that innovation in teaching materials can strengthen differentiated learning. The success of differentiated learning in geography education is only a small part of the various challenges in its implementation. These challenges become increasingly critical because geography education is often perceived as a theoretical subject and less appealing to students if not connected to real-life contexts (Nufus, Rahman, & Marthinu, 2019). The application of differentiated learning is one of the keys to increasing students' interest, understanding, and participation in geography lessons.

Teachers' pedagogical competencies are crucial and pose a unique challenge in this situation, as teachers are required to design educational learning activities and develop students' potential so that they can actualize their potential as optimally as possible through the learning process (Lubis, 2018). However, if teachers, as the primary actors in the learning process, lack adequate understanding and ability to apply this approach, the objectives of implementing the Merdeka Belajar Curriculum will not be achieved optimally (Lestari, Bahrozi, & Yuliana, 2023). This research is important because of the urgent need to know the extent to which high school geography teachers understand and are able to implement differentiated learning in schools. Additionally, there have not been many studies that specifically explore the context of differentiated learning in geography, even though the complex characteristics of geography

material and the spatial thinking skills needed for life require careful and flexible differentiation strategies. This research is also important because it can provide recommendations for teacher professional development, strengthening practice-based training programs, and designing educational policies that systematically support differentiated learning practices.

Furthermore, a bibliometric study by Nugroho, Sugiyanto, & Prihadi (2025), highlights that although there is a growing body of research on curriculum implementation and geography learning methods, differentiated instruction in secondary geography education remains underexplored and requires deeper empirical attention. Based on the above description, this study aims to describe the level of understanding of geography teachers in senior high schools regarding the implementation of differentiated learning, with an emphasis on the dimensions of content, process, product, and learning environment. This study employs a quantitative approach through a survey method using a questionnaire systematically designed based on indicators of differentiated instruction (Tomlinson & Imbeau, 2023). The uniqueness (novelty) of this study lies in mapping high school geography teachers' understanding of the concept of differentiated instruction in the context of the Merdeka Curriculum, which has so far been minimally focused on in research in Indonesia, especially at the secondary education level. Additionally, this study fills a gap in the literature by providing empirical evidence based on quantitative data from geography teachers, who have often been marginalized in studies on differentiated learning.

2. METHODS

2.1. *Research Design*

This study uses a quantitative approach with a descriptive survey method to determine geography teachers' understanding of differentiated learning in senior high schools. The quantitative approach was chosen to systematically collect numerical data that can be analyzed statistically to provide a measurable picture of teachers' level of understanding in various dimensions of differentiated learning (Pilcher & Cortazzi, 2024). A descriptive survey design was used in this study to help researchers collect comprehensive information from a broad sample of geography teachers regarding their understanding of the implementation of differentiated learning in the context of the Merdeka Belajar Curriculum in Indonesia (Kumaran & Praveenakumar, 2025). The focus of this study is to examine geography teachers' understanding of the four key dimensions of differentiated learning as conceptualized by Tomlinson & Imbeau (2023), namely content differentiation, process differentiation, product differentiation, and learning environment differentiation. This research design is highly relevant for mapping the current state of teachers' understanding and identifying areas that require further professional development support related to differentiated instruction.

2.2. *Research Population and Sample*

The target population in this study is all geography teachers teaching at senior high schools (SMA) in Indonesia who are implementing the Merdeka Belajar Curriculum. Given the wide geographical spread and large number of geography teachers throughout Indonesia. Therefore, probability sampling was used to provide equal opportunity for all eligible geography teachers in senior high schools across Indonesia to participate. The researchers employed a time-based voluntary response sampling strategy, where any teacher who met the predefined criteria and submitted the questionnaire within the one-month data collection period was included in the sample (Hazari, 2023). This method was selected to maximize participation and ensure geographical representation, allowing for broader generalization across different school contexts (Hossan, Dato' Mansor, & Jaharuddin, 2023). The criteria for selecting the research sample include: (1) geography teachers with a minimum of three years of teaching experience, (2) teaching geography in Phase E and Phase F or Senior High School level, (3) having participated in Merdeka Curriculum training, (4) being graduates of a Bachelor of Education program in Geography Education, and (5) willing to voluntarily participate in an online survey. This study did not specify the sample size but used a data collection approach over a specific time period. All geography teachers at senior high schools who met the criteria and completed the questionnaire within the one-month data collection period

would be included in the study sample. This approach was chosen to maximize the participation of geography teachers from various provinces in Indonesia and to obtain a comprehensive picture of their understanding of differentiated learning (Wang, Mao, & Kim, 2022).

2.3. *Questionnaire Development*

The main data collection instrument was a structured online questionnaire specifically designed to measure geography teachers' understanding of differentiated learning. The questionnaire was developed based on an established theoretical framework of differentiated learning, specifically referring to a comprehensive model of differentiated learning practices (Tomlinson & Imbeau, 2023). The questionnaire consists of four main components of differentiated learning: (1) Content differentiation, which includes teachers' ability to adapt learning materials to students' needs, interests, and academic readiness; (2) Process differentiation, which includes teachers' ability to manage the learning process with strategies appropriate to the diversity of learning styles and levels of understanding among students; (3) Product differentiation, which includes teachers' flexibility in evaluating students' understanding through various forms of tasks and assessments that are appropriate to students' potential; and (4) Learning environment differentiation, which includes teachers' efforts to create an inclusive, adaptive, and supportive learning environment, including the use of technology and classroom arrangements. Each section uses a 4-point Likert scale ranging from "strongly disagree" (1), "disagree" (2), 'agree' (3), to "strongly agree" (4) to measure teachers' level of understanding and agreement wit (South, Saffo, Vitek, Dunne, & Borkin, 2022).

2.4. *Validity and Reliability of Instruments*

The research questionnaire has undergone external validation to ensure the validity of its content and the practical relevance of the instrument to real-world conditions in the field (Creswell, 2017). External validity was established through assessments by education practitioners consisting of school principals, vice principals, and geography teachers who have direct experience in implementing differentiated learning in schools. These external validators were selected because they have a deep understanding of the real conditions of learning implementation in schools and can provide practical input on the relevance, accuracy, and ease of understanding of each questionnaire item. School principals and vice principals provide managerial and school policy perspectives, while geography teachers provide technical pedagogical insights from the perspective of direct practitioners. The validation process involved evaluating each questionnaire item in terms of: (1) relevance to geography learning conditions in high schools, (2) clarity of language and sentence structure, (3) suitability to the context of the Merdeka Curriculum implementation, and (4) ease of understanding for geography teachers in general. Feedback from external validators was used to revise and refine the instrument before the pilot test. The pilot test was conducted with 30 geography teachers who were not included in the main research sample to evaluate the reliability of the instrument and identify potential issues with question clarity or the technical functionality of the online platform. Reliability testing using Cronbach's alpha coefficient was conducted to ensure the internal consistency of each dimension measured in the questionnaire (Amirrudin, Nasution, & Supahar, 2020). The reliability coefficient for each section exceeded the acceptable threshold of 0.70, indicating satisfactory internal consistency of the instrument.

2.5. *Data collection procedure*

Data collection was conducted entirely through an online survey platform (Google Forms) during the period from March 28, 2025, to April 28, 2025. The online approach was chosen for its efficiency in reaching geographically dispersed participants, cost-effectiveness, and ability to maintain social distancing protocols when necessary. The survey link was distributed through various channels to maximize participation: (1) collaboration with the provincial education office to reach teachers through official networks; (2) dissemination through geography teacher associations and professional organizations; (3) sharing through social media platforms commonly used by geography educators; and (4) snowball sampling techniques, in which participating teachers were encouraged to share the survey with their colleagues. Prior to data collection, participants received a consent form explaining the research objectives, confidentiality measures, the voluntary nature of participation, and contact information for

questions. The online questionnaire was accompanied by clear instructions and designed to be completed in 15–20 minutes to minimize participant burden while ensuring comprehensive data collection. Response rate monitoring was conducted periodically during the data collection period, with reminder messages sent to increase participation. Data quality checks were applied to identify and exclude incomplete responses or those showing response patterns indicating a lack of serious engagement.

2.6. *Data Analysis Techniques*

The collected data were analysis using descriptive and inferential statistical techniques appropriate to the research objectives. Data processing began with a thorough cleaning procedure to identify missing values, outliers, and inconsistent responses. Descriptive statistics, including mean, standard deviation, frequency, and percentage, were calculated to summarize teachers' level of understanding of each dimension of differentiated learning (Adnan & Latief, 2020). The analysis focused on determining the overall level of understanding and testing variations based on different teacher characteristics such as teaching experience, educational background, school location, and previous training in the Merdeka Belajar Curriculum. Cross-tabulation analysis was conducted to explore the relationship between demographic variables and the level of understanding. Likert scale responses were calculated, and average scores were calculated for each dimension and interpreted using predetermined criteria. The Statistical Package for Social Sciences (SPSS) software was used for all quantitative analyses. Qualitative responses from open-ended questions were analysis using thematic analysis to identify common patterns, challenges, and suggestions related to the implementation of differentiated learning in geography education (Abdussamad, 2021). Findings from quantitative and qualitative analyses were integrated to provide a comprehensive understanding of the research phenomenon.

3. FINDINGS AND DISCUSSION

3.1. *Geography Teachers' General Level of Understanding of Differentiated Instruction*

The level of understanding of differentiated learning among geography teachers was determined by first categorizing the teachers' level of understanding of differentiated learning. The categorization score used was a hypothetical score, as categorization based on hypothetical scores is more appropriate for interpreting groups, while empirical scores are more suitable for the individual level (Ijaq et al., 2019). Based on the results of the hypothetical score categorization analysis, it was found that out of 120 respondents who met the selected sample criteria, a total of 59 respondents, 39 teachers (66.1%) were in the high category, 20 teachers (33.9%) were in the medium category, and no teachers were in the low category.

Table 1. Distribution of Geography Teachers' Level of Understanding

Categorization	Interval	Range	Respondent Count
Low	$X < M - 1.5SD$	$X < 35$	0
Medium	$M - 1.5SD < X \leq M + 1.5SD$	$35 < X \leq 65$	20
High	$X > M + 1.5SD$	$X > 65$	39
	Total Respondents		**59**

Based on the data in Table 1, it can be seen that teachers' level of understanding of differentiated learning is predominantly high. This means that many teachers already understand differentiated learning. This finding shows that geography teachers have a fairly strong conceptual understanding of the main principles of differentiated learning, including the aspects of content, process, product, and learning environment differentiation. This is in line with the opinion of Tomlinson & Imbeau (2023), who state that the success of differentiated learning is largely determined by teachers' comprehensive understanding of these dimensions. In the research findings of Sindy Dwi Jayanti, Agus Suprijono, & M. Jacky (2023), the implementation of differentiated learning in the Merdeka Belajar Curriculum for history lessons at SMA Negeri 22 Surabaya shows that the application of this approach requires

teachers to have a deep understanding of the principles of differentiated learning. This finding is relevant to the context of geography learning, as both subjects share similar characteristics as part of the social sciences, which require a learning approach that can accommodate student diversity in understanding spatial, temporal, and socio-cultural phenomena. Therefore, examining teachers' understanding of differentiated learning is important to ensure the effective implementation of the Merdeka Belajar Curriculum, particularly in developing students' competencies in understanding the dynamics of the geosphere and human interactions with their environment.

3.2. *The Effect of Merdeka Belajar Curriculum Training on Teachers' Understanding*

Hierarchical regression analysis was conducted to identify significant variables influencing geography teachers' understanding. In the first model (M1), only background variables as geography teachers were included, and the results were not significant ($p > 0.05$). Meanwhile, in the second model (M2), when the variable of participation in the Merdeka Belajar Curriculum training was added, a significant increase in the R^2 value and model significance was found.

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.049[a]	.002	-.008	7.27839	.002	.243	1	100	.623
2	.293[b]	.086	.067	7.00231	.083	9.041	1	99	.003

a. Predictors: (Constant), Geography teacher
b. Predictors: (Constant), Participating in the Merdeka Belajar Curriculum training

Table 3. Results of Variance Analysis (ANOVA) Hierarchical Regression

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.857	1	12.857	.243	.623[b]
	Residual	5297.496	100	52.975		
	Total	5310.353	101			
2	Regression	456.144	2	228.072	4.651	.012[c]
	Residual	4854.209	99	49.032		
	Total	5310.353	101			

a. Dependent Variable: Differentiated Learning
b. Predictors: (Constant), Geography Teachers
c. Predictors: (Constant), Participating in the Merdeka Belajar Curriculum training

Table 4. Regression Coefficient for Each Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	69.651	1.110		62.752	.000
	Geography Teacher	-.719	1.459	-.049	-.493	.623
2	(Constant)	64.585	1.995		32.379	.000
	Geography Teacher	-.642	1.404	-.044	-.457	.648
	Participating in the Merdeka Belajar Curriculum training	5.887	1.958	.289	3.007	.003

a. Dependent Variable: Pembelajaran Berdiferensiasi

Hierarchical regression analysis was conducted to identify significant variables influencing geography teachers' understanding. In the first model (M1), only background variables as geography teachers were included, and the results were not significant ($p > 0.05$). In the second model (M2), when the variable of participation in the Merdeka Belajar Curriculum training was added, a significant

increase in the R^2 value and model significance was found. Based on the results of the analysis using hierarchical regression analysis while controlling for the subject type variable (specifically geography), it was found that in the first model (M1), geography teachers could not predict the level of teachers' understanding of differentiated learning ($R = 0.002$; $F = 0.243$; $p = 0.623$). Meanwhile, in the second model (M2) after adding the Merdeka Belajar curriculum training variable (controlling only for subject teachers who participated in the training), it was found that geography subject teachers who had participated in the Merdeka Belajar curriculum training could predict understanding of differentiated learning ($R = 0.293$; $F = 4.651$; $p = 0.12$). Furthermore, when comparing the determination coefficients between M1 and M2, a difference of ($\Delta R^2 = 0.083$) was found, where in M1 the R^2 value was 0.002, and after adding the independent curriculum training variable, R^2 changed to 0.086. This means that the subject type variable (geography) contributes only 0.2%, and the independent curriculum training variable contributes 8.3%. Together, they contribute 8.6%, with the remainder influenced by other variables outside the scope of this study.

$$\hat{Y} = b0 + bx1 + bx2 + e$$

$$\hat{Y} = 64.585 + (-0.642) + 5.887 + e$$

Based on the regression formula, the predictive function of the predictor variable on the criterion can be determined. Thus, it can be said that the score for geography teachers' understanding of differentiated learning without other variables is 64.585. Then, if the geography subject variable is included, it will decrease by 0.642 and increase by 5.887 if the independent curriculum training variable is included. These results are also supported by the t-values found, indicating that only the independent curriculum training variable can predict teachers' understanding of differentiated instruction ($t = 3.007$; $p = 0.003$). Meanwhile, the geography subject variable does not ($t = -0.457$; $p = 0.648$).

3.3. *Practical Implications for Teacher Professional Development*

The finding that only the training variable of the Merdeka Curriculum significantly influences geography teachers' understanding of differentiated learning has important implications for teacher professional development policies and practices. Statistically, participation in training increased teachers' understanding scores by 5,887 points. This indicates that systematic, relevant, and sustained training programs play a key role in equipping teachers with the pedagogical competencies needed to effectively implement a differentiated approach (Lestari et al., 2023).

These results are reinforced by a study by Yahya et al. (2023), which shows that teachers who participate in practice-based training in the Merdeka Curriculum have a higher ability to design learning that is adaptive to student diversity. Similarly, Amiruddin et al. (2023), emphasize the importance of independent teacher training as a key strategy in supporting the success of curriculum transformation. A study by Andrianto, Mu'amalah, & Wulandari (2024), also found that training based on real classroom needs has a significant impact on encouraging teachers to adopt innovative and contextual instructional strategies.

However, the contribution of the regression model to the overall understanding of teachers is only 8.6%, indicating that more than 90% of other variables are not covered in this model. This means that teachers' understanding of differentiated learning is also greatly influenced by institutional and psychosocial contexts, such as school culture, principal support, administrative pressure, and teacher self-efficacy (Azmi, Sukamdani, & Maharani, 2023).

Research by Gunawan & Bahari (2024), emphasizes that teacher development policies need to consider workplace factors, including administrative workload, availability of learning resources, and access to professional learning communities. Meanwhile, a study by Oktaviani & Ramayanti (2023), shows that teachers' perceptions of the usefulness of training greatly influence the effectiveness of internalizing differentiation strategies in learning. Therefore, training policies that are based on real-

world practice, contextual to the field of study, and sustainable are important strategies for improving the quality of adaptive and meaningful geography learning.

3.4. *The Context of Geography Learning and Opportunities for Differentiation*

Geography, as a cross-domain subject that examines the relationship between natural and social phenomena theoretically, is ideal for a differentiated learning approach. The contextual, current, and diverse nature of geography material in terms of themes and scale provides great opportunities for teachers to tailor learning based on students' interests, readiness, and learning styles (Silviariza et al., 2020). However, the results of this study indicate that a background as a geography teacher does not significantly influence the level of understanding of differentiated learning. This suggests that while geography is inherently compatible with differentiation, it has not yet been optimally utilized in practice. This finding is consistent with research by (Nufus et al., 2019), which states that geography learning tends to be one-sided and teacher-centered if not supported by specialized pedagogical training.

In a study conducted by (Mahat et al., 2020), it was found that geography teachers tend to rely on lecture methods and the use of textbooks, which leave little room for differentiation in both products and processes. However, spatial project-based approaches, the use of geospatial data, and locally-based learning are effective strategies for implementing differentiation in geography education (Sumarmi, Bachri, Irawan, Aliman, & Ahmad, 2021). The gap between geographical potential and implementation reality highlights the importance of providing specialized pedagogical training for geography teachers. Such training should focus on integrating differentiated approaches into spatial-based learning design, problem-based learning, and the exploration of maps and GIS technology as adaptive learning tools (Isromi et al., 2022). Furthermore, strengthening geography learning community networks, collaboration among teachers, and disseminating good practices from schools that have successfully implemented differentiated learning in geography subjects can be key to improving the quality of geography education in Indonesia (Hickman, 2023).

4. CONCLUSION

This study aims to describe the level of understanding of high school geography teachers regarding the implementation of differentiated learning in the context of the Merdeka Belajar Curriculum. The results of the study indicate that most geography teachers have a high level of understanding of the principles of differentiated learning, particularly in terms of content, process, product, and learning environment. This reflects the conceptual readiness of teachers to accommodate the diverse learning needs of students in the classroom. However, hierarchical regression analysis shows that being a geography teacher does not significantly influence the level of understanding. Instead, teachers' participation in Merdeka Belajar Curriculum training has been proven to be a significant predictor in improving their understanding of differentiated instruction. These findings explain that teachers' professional development through systematic, applicable, and contextual training has a significant contribution in shaping their understanding and readiness to implement innovative learning strategies. Practically, this research provides an important contribution to teacher training program planning, particularly in encouraging training that focuses on the application of differentiated learning in Geography subjects. Additionally, theoretically, this study fills a gap in the literature, which has previously lacked discussions on differentiated learning in the context of geography at the secondary education level. Further research is recommended to explore other factors influencing the implementation of differentiated learning, such as school management support, availability of learning resources, and teachers' perceptions of the effectiveness of differentiation in geography education.

Acknowledgments: Thank you to the Geography Teacher who kindly filled out the research questionnaire so that this research could be carried out. Thank you to Universitas Sebelas Maret for funding this research through the Research Group Assistance Scheme for 2025.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abdussamad, Z. (2021). *Metode Penelitian Kualitatif* (I; P. Rapanna, ed.). Makassar: CV Syakir Media Press.

Adnan, G., & Latief, M. A. (2020). *Metode penelitian pendidikan penelitian kuantitatif, penelitian kualitatif, penelitian tindakan kelas*. Erhaka Utama.

Akhiruddin, A., Bashori, I., & Pasiamping, Y. (2024). The influence of problem-based learning strategies on student learning motivation and learning outcomes. *AL-ISHLAH: Jurnal Pendidikan*, *16*(3), 3732–3741. https://doi.org/10.35445/alishlah.v16i3.5073 The

Amirrudin, M., Nasution, K., & Supahar, S. (2020). Effect of Variability on Cronbach Alpha Reliability in Research Practice. *Jurnal Matematika, Statistika Dan Komputasi*, *17*(2), 223–230. https://doi.org/10.20956/jmsk.v17i2.11655

Amiruddin, A., Siregar, M., Anggara, A., Faridah, F., Faraiddin, M., & Syafridah, N. (2023). Pelatihan Mandiri Kurikulum Merdeka Belajar dengan Pemanfaatan Platform Merdeka Mengajar di Satuan Pendidikan. *Jurnal Penelitian, Pendidikan Dan Pengajaran: JPPP*, *4*(1), 1–4. https://doi.org/10.30596/jppp.v4i1.13392

Andrianto, D., Mu'amalah, H., & Wulandari, S. F. (2024). PENDIDIKAN DAN PELATIHAN (DIKLAT) NASIONAL INOVATIF DALAM PENDIDIKAN: MEMBANGUN KOMPETENSI PENTING GURU DALAM ERA KURIKULUM MERDEKA. *Jurnal PkM Pemberdayaan Masyarakat*, *5*(2), 74–84. https://doi.org/10.56327/jurnalpkm.v5i2.118

Ariga, S. (2023). Implementasi Kurikulum Merdeka Pasca Pandemi Covid-19. *Edu Society: Jurnal Pendidikan, Ilmu Sosial Dan Pengabdian Kepada Masyarakat*, *2*(2), 662–670. https://doi.org/10.56832/edu.v2i2.225

Azmi, R., Sukamdani, H. B., & Maharani, M. D. D. (2023). Strategi Penguatan Materi Kurikulum Merdeka Belajar Dalam Menghadapi Persaingan Prospek Kerja. *Syntax Literate ; Jurnal Ilmiah Indonesia*, *7*(9), 16273–16287. https://doi.org/10.36418/syntax-literate.v7i9.13902

Béneker, T., Bladh, G., & Lambert, D. (2024). Exploring 'Future three' curriculum scenarios in practice: Learning from the GeoCapabilities project. *Curriculum Journal*, *35*(3), 396–411. https://doi.org/10.1002/curj.240

Creswell, J. W. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Gunawan, I., & Bahari, Y. (2024). Problematika Kurikulum Merdeka Dalam Sudut Pandang Teori Struktural Fungsional (Study Literatur). *Journal Of Human And Education (JAHE)*, *4*(4), 178–187. https://doi.org/10.31004/jh.v4i4.1191

Hazari, A. (2023). *Sampling Types and Methods BT - Research Methodology for Allied Health Professionals: A comprehensive guide to Thesis & Dissertation* (A. Hazari, ed.). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-8925-6_6

Hickman, J. (2023). Spatial thinking and GIS: developing and assessing student competencies. *International Research in Geographical and Environmental Education*, *32*(2), 140–158. https://doi.org/10.1080/10382046.2022.2138172

Hossan, D., Dato' Mansor, Z., & Jaharuddin, N. S. (2023). Research Population and Sampling in Quantitative Study. *International Journal of Business and Technopreneurship (IJBT)*, *13*(3), 209–222. https://doi.org/10.58915/ijbt.v13i3.263

Ijaq, J., Malik, G., Kumar, A., Das, P. S., Meena, N., Bethi, N., … Suravajhala, P. (2019). A model to predict the function of hypothetical proteins through a nine-point classification scoring schema. *BMC Bioinformatics*, *20*(1), 1–8. https://doi.org/10.1186/s12859-018-2554-y

Ismajli, H., & Imami-Morina, I. (2018). Differentiated instruction: Understanding and applying interactive strategies to meet the needs of all the students. *International Journal of Instruction*, *11*(3), 207–218. https://doi.org/10.12973/iji.2018.11315a

Isromi, A., Malik, A., & Maru, R. (2022). Development of Character-Based Student Worksheets in

Online Learning in Geography Subjects. *AL-ISHLAH: Jurnal Pendidikan*, *14*(4), 5241–5252. https://doi.org/10.35445/alishlah.v14i4.1915

Kumar, A., & Praveenakumar, S. G. (2025). *Research methodology*. India: Authors Click Publishing.

Lestari, P. D. J. P., Bahrozi, I., & Yuliana, I. (2023). Kompetensi Pedagogik Guru dalam Pelaksanaan Kurikulum Merdeka. *Jurnal Review Pendidikan Dasar : Jurnal Kajian Pendidikan Dan Hasil Penelitian*, *9*(3), 153–160. https://doi.org/10.26740/jrpd.v9n3.p153-160

Lubis, H. (2018). Kompetensi Pedagogik Guru Profesional. *Best Journal (Biology Education, Sains and Technology)*, *1*(2), 16–19. https://doi.org/10.30743/best.v1i2.788

Mahat, H., Arshad, S., Saleh, Y., Aiyub, K., Hashim, M., & Nayan, N. (2020). Penggunaan dan penerimaan bahan bantu mengajar multimedia terhadap keberkesanan pembelajaran Geografi. *Malaysian Journal of Society and Space*, *16*(3). https://doi.org/10.17576/geo-2020-1603-16

Nufus, I. A. K., Rahman, N. A., & Marthinu, E. (2019). Analisis Minat Belajar Siswa pada Mata Pelajaran Geografi di Kelas XI IPS SMA Negeri 2 Kota Ternate. *Pangea: Wahana Informasi Pengembangan Profesi Dan Ilmu Geografi*, *1*(2), 75. Retrieved from http://ejournal.unkhair.ac.id/index.php/pangea/article/view/1483

Nugroho, A. E. J. K., Sugiyanto, S., & Prihadi, S. (2025). Implementation of Geography Curriculum and Learning Methods : A Bibliometric Analysis. *Jurnal Eduscience*, *12*(4), 967–987. https://doi.org/10.36987/jes.v12i4.7033

Oktaviani, S., & Ramayanti, F. (2023). Analisis Kesiapan Sekolah dalam Mengimplementasikan Kurikulum Merdeka Belajar di Sekolah Dasar. *Jurnal Basicedu*, *7*(3), 1454–1460. https://doi.org/10.31004/basicedu.v7i3.5156

Pilcher, N., & Cortazzi, M. (2024). "Qualitative" and "quantitative" methods and approaches across subject fields: implications for research values, assumptions, and practices. In *Quality and Quantity* (Vol. 58). Springer Netherlands. https://doi.org/10.1007/s11135-023-01734-4

Purwowidodo, A., & Zaini, M. (2023). *Teori dan Praktik Model Pembelajaran Berdiferensiasi Implementasi Kurikulum Merdeka Belajar* (I; M. Fathurrohman, ed.). Yogya: Penebar Media Pustaka.

Silviariza, W. Y., Sumarmi, & Handoyo, B. (2020). Using of Spatial Problem Based Learning (SPBL) model in geography education for developing critical thinking skills. *Journal for the Education of Gifted Young Scientists*, *8*(3), 1045–1060. https://doi.org/10.17478/JEGYS.737219

Simm, D., & and Marvell, A. (2017). Creating global students: opportunities, challenges and experiences of internationalizing the Geography curriculum in Higher Education. *Journal of Geography in Higher Education*, *41*(4), 467–474. https://doi.org/10.1080/03098265.2017.1373332

Sindy Dwi Jayanti, Agus Suprijono, & M. Jacky. (2023). Implementasi Pembelajaran Berdiferensiasi Dalam Kurikulum Merdeka Pada Mata Pelajaran Sejarah Di SMA Negeri 22 Surabaya. *EDUKASIA: Jurnal Pendidikan Dan Pembelajaran*, *4*(1), 561–566. https://doi.org/10.62775/edukasia.v4i1.304

South, L., Saffo, D., Vitek, O., Dunne, C., & Borkin, M. A. (2022). Effective Use of Likert Scales in Visualization Evaluations: A Systematic Review. *Computer Graphics Forum*, *41*(3), 43–55. https://doi.org/https://doi.org/10.1111/cgf.14521

Sumarmi, S., Bachri, S., Irawan, L. Y., Aliman, M., & Ahmad, W. I. W. (2021). Project-Based Research Learning (PBRL) Integrated With E-Learning in Projects Completion. *International Journal of Emerging Technologies in Learning*, *16*(7), 16–31. https://doi.org/10.3991/ijet.v16i07.21193

Susilawati, & Juanda, A. O. (2023). Analisis Struktur Kurikulum K13 dan Struktur Kurikulum Merdeka Fase E untuk Kelas X dan Fase F untuk Kelas XII. *Jurnal Literasi Dan Pembelajaran Indonesia*, *3*(1), 24–32.

Tomlinson, C. A., & Imbeau, M. B. (2023). *Leading and managing a differentiated classroom*. Ascd.

Wahyudin, D., Subkhan, E., Malik, A., Hakim, M. A., Sudiapermana, E., Alhapip, L., … Krisna, F. N. (2024). *Kajian akademik kurikulum merdeka*. Jakarta: Pusat Kurikulum dan Pembelajaran Badan Standar, Kurikulum, dan Asesmen Pendidikan KEMENDIKBUDRISTEK.

Wang, Z., Mao, X., & Kim, J. K. (2022). Functional Calibration under Non-Probability Survey Sampling. *ArXiv Preprint ArXiv:2204.09193*.

Widanti, N. N. S., Rindawati, R., Muzayanah, M., & Chanthoeurn, D. (2023). The effectiveness of differentiated learning in Geography subject, anthroposphere material, for grade X at SMAN 4 Sidoarjo. *Jurnal Teori Dan Praksis Pembelajaran IPS*, *8*(2), 95. https://doi.org/10.17977/um022v8i22023p95

Yahya, F., Irham, M., Suryani, E., Nurul Walidain, S., Samawa, U., Besar, S., & Paracendikia Sumbawa, S. N. (2023). Peningkatan Kapasitas Guru Dalam Pelaksanaan Pembelajaran Berdiferensiasi Sesuai Dengan Kurikulum Merdeka. *KARYA: Jurnal Pengabdian Kepada Masyarakat*, *3*(1), 383–387. Retrieved from https://jurnalfkip.samawa-university.ac.id/KARYA_JPM/article/view/404

Study of Geography Teachers' Understanding of Differentiated Instruction in Senior High Schools.docx

ORIGINALITY REPORT

23%	16%	17%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universitas Negeri Jakarta Student Paper	2%
2	Nondumiso Mnyamana, Samson Matope, Clever Ndebele. "Examining Grade 6 Teachers' Knowledge and Understanding of Differentiated Instruction in O.R. Tambo Inland District in South Africa", E-Journal of Humanities, Arts and Social Sciences, 2024 Publication	2%
3	www.researchgate.net Internet Source	1%
4	journal.staihubbulwathan.id Internet Source	1%
5	Endah Retnowati, Anik Ghufron, Marzuki, Kasiyan, Adi Cilik Pierawan, Ashadi. "Character Education for 21st Century Global Citizens", Routledge, 2018 Publication	1%
6	jurnal.ustjogja.ac.id Internet Source	1%
7	Adelia Putri Sipahutar, Nurhayani Nurhayani. "The Effect of Classical Counseling Guidance Services on Increasing Self-Control of High School Students", Scaffolding: Jurnal Pendidikan Islam dan Multikulturalisme, 2024 Publication	1%

8	Silvia Permatasari Silvia, M. Nur Mustafa. "Implementation of Differentiation Learning Through ClassPoint-Integrated PowerPoint-Based Media at Junior High School 4 Tambang", Jurnal Pengabdian Masyarakat, 2025 Publication	1 %
9	journal-gehu.com Internet Source	1 %
10	repository.stkippacitan.ac.id Internet Source	1 %
11	rulrepository.ru.ac.bd Internet Source	1 %
12	Muhammad Surya Rifqi. "Exploring Challenges of Differentiated Instruction in English Foreign Language Classroom", LET: Linguistics, Literature and English Teaching Journal, 2024 Publication	1 %
13	www.mdpi.com Internet Source	1 %
14	mail.jurnaledukasia.org Internet Source	<1 %
15	repository.paramadina.ac.id Internet Source	<1 %
16	Donna Pendergast, Katherine Main. "Teaching Primary Years - Rethinking curriculum, pedagogy and assessment", Routledge, 2020 Publication	<1 %
17	ejournal.1001tutorial.com Internet Source	<1 %
18	pdfs.semanticscholar.org Internet Source	<1 %

19	www.coursehero.com Internet Source	<1%
20	"Handbook of Geography Education", Springer Science and Business Media LLC, 2024 Publication	<1%
21	Chatarina Muryani, Dannis Ni'matussyahara. "The area and distribution changes of mangrove forests on the coast of Gresik Regency, East Java, 2012-2023", IOP Conference Series: Earth and Environmental Science, 2024 Publication	<1%
22	Minghui Fang. "The Correlation Between Motivation and IELTS Reading Achievement Among Chinese Students", Research Square Platform LLC, 2024 Publication	<1%
23	knepublishing.com Internet Source	<1%
24	kurdishstudies.net Internet Source	<1%
25	mro.massey.ac.nz Internet Source	<1%
26	ijms.info Internet Source	<1%
27	www.econstor.eu Internet Source	<1%
28	Submitted to IAIN Syaikh Abdurrahman Siddik Bangka Belitung Student Paper	<1%
29	Irwan Trinugroho, Evan Lau. "Business Innovation and Development in Emerging	<1%

Economies", CRC Press, 2019
Publication

30 Abdul-Malik Abdulai, Samson Alhassan, Mohammed Saani Muftawu, Kabriku Peter Claver et al. "Knowledge and Attitude Towards Chronic Kidney Disease Among Residents in the Tamale Metropolis: A Cross-Sectional Study", Cold Spring Harbor Laboratory, 2025 <1%
Publication

31 Aprianisa Nur Fajrin, Soni Nopembri, Tri Ani Hastuti. "Physical literacy: physical literacy knowledge and its relationship to physical fitness of senior high school students", Retos, 2025 <1%
Publication

32 Zainul Mustofa. "The Impact of Mind Mapping on Modeling Instruction in Topic of Life Organization System to Conceptual Understanding", SEAQIS Journal of Science Education, 2022 <1%
Publication

33 Iva Nur Ainnin, Ismail Ismail. "Integration of Islamic Education into Early Childhood Education Education Curriculum: Building Character in the Digital Era", Absorbent Mind, 2024 <1%
Publication

34 Karunia Puji Hastuti, Deasy Arisanty, Sunarno Basuki, Dharmono Dharmono, Ali Rachman. "Developing Students' Critical Thinking Skills Through Differentiated Problem-Based Learning", Pedagogika, 2024 <1%
Publication

35 Submitted to Universitas Riau

	Student Paper	<1%
36	baadalsg.inflibnet.ac.in Internet Source	<1%
37	clok.uclan.ac.uk Internet Source	<1%
38	core.ac.uk Internet Source	<1%
39	ejournal.indo-intellectual.id Internet Source	<1%
40	online-journal.unja.ac.id Internet Source	<1%
41	www.arpnjournals.org Internet Source	<1%
42	Ade Gafar Abdullah, Tutin Aryanti, Agus Setiawan, Maizam Binti Alias. "Regionalization and Harmonization in TVET", CRC Press, 2017 Publication	<1%
43	Goonatilleke, Deepani Himali. "Effect of Project-Based Learning on High School Chemistry Student Performance.", The University of West Florida Publication	<1%
44	academica-e.unavarra.es Internet Source	<1%
45	alhayat.or.id Internet Source	<1%
46	cosmos.iaisambas.ac.id Internet Source	<1%
47	eprints.umpo.ac.id Internet Source	<1%
	eprints.unm.ac.id	

48	Internet Source	<1%
49	ijmmu.com Internet Source	<1%
50	www.journal.staidk.ac.id Internet Source	<1%
51	www.journal.staihubbulwathan.id Internet Source	<1%
52	Acep Mulyadi, Muhammad Syakhil Afkar Ramadhani. "Implementation of Merdeka Curriculum: The Role of Islamic Education Lesson in Shaping the Pancasila Student Profile", Jurnal Penelitian Pendidikan Islam, 2024 Publication	<1%
53	Desy Rufaidah, Andayani Andayani, Nugraheni Eko Wardani. "Multiliteracy-Based Differentiated Instruction for Language Learning in the Center of Excellence Vocational High Schools", World Journal of English Language, 2024 Publication	<1%
54	Hernandez Rodriguez, Debora. "Bridging Linguistic Landscapes: General Education Teachers' Instructional Experiences With Emergent Bilingual Learners.", Lamar University - Beaumont Publication	<1%
55	eclss.org Internet Source	<1%
56	ecohumanism.co.uk Internet Source	<1%
57	journal.unj.ac.id Internet Source	<1%

58	skillerindonesia.id Internet Source	<1%
59	A. Padauleng, Amirullah Abduh, Samtidar Samtidar, Abu Muslim et al. "Differentiated Instruction in a Public Junior High School: EFL Teachers' Perception and Practices", World Journal of English Language, 2025 Publication	<1%
60	Tadesse Melesse, Sinatayehu Belay. "Differentiating instruction in primary and middle schools: Does variation in students' learning attributes matter?", Cogent Education, 2022 Publication	<1%
61	Albet Maydiantoro, Caswita Caswita, Ridwan Ridwan, Hermi Yanzi, Eka Sofia Agustina, Achril Zalmansyah. "Analysis of Teacher's Professional Competency in Students of Teacher Professional Education", SAR Journal - Science and Research, 2024 Publication	<1%
62	Anastasia Papanthymou, Maria Darra. "Perceptions of Primary School Teachers Regarding the Implementation of Differentiated Instruction to Students with Learning Difficulties", World Journal of Education, 2022 Publication	<1%
63	Hatixhe Ismajli, Ilirjana Imami-Morina. "Differentiated Instruction: Understanding and Applying Interactive Strategies to Meet the Needs of all the Students", International Journal of Instruction, 2018 Publication	<1%

64	John Oware Ennin. "Decoding Instructional Leadership: A Qualitative Examination of Headmasters' Insights and Implementation Strategies in Senior High Schools within Greater Kumasi Metropolis, Ghana", Springer Science and Business Media LLC, 2025 Publication	<1%
65	Ningbo Wang, Zhihong Li, Jiajiao Wu, Edwin G. Rajotte, Fanghao Wan, Zhiling Wang. "Chapter 42 The Potential Geographical Distribution of bactrocera Dorsalis (Diptera: Tephrididae) in China Based on Emergence Rate Model and Arcgis", Springer Science and Business Media LLC, 2009 Publication	<1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		