The Effect of Geographical Inquiry Based on Learning Style Differentiation on Students’ Critical Thinking Skills

Mentari Pradi Galih
Nurani, M. P. G., Budi Handoyo, A. K., Rashid, S., & Meilana, L. N. (2024). The Effect of Geographical Inquiry Based on Learning Style Differentiation on Students’ Critical Thinking Skills. Future Space: Studies in Geo-Education. 1(2), 129-144 © 2024 by the authors of this article. Published under CC-BY.
as building creativity and producing enjoyable learning (Vhalery et al., 2022). The incorporation of technology within the educational framework is a pivotal reason for the implementation of the Merdeka Curriculum, as it facilitates a more adaptive, student-centered learning environment (Saputro et al., 2023). Specifically, technology enables the customization of learning experiences to meet diverse student needs, supports the integration of innovative teaching methods, and provides access to a wide range of resources and information. Technology in education is developing massively, offering a pivotal solution to the learning crisis characterized by gaps in access, engagement, and achievement. By facilitating personalized learning, enhancing accessibility, and providing interactive and diverse educational content, technology addresses these challenges head-on, promising a more equitable and effective learning landscape (Aryanti, 2023).

The Merdeka Curriculum carries a calmer, more relaxed, and varied learning design so students can choose their learning needs to show their natural talents (Rahayu et al., 2022). The needs of each student in class could be very diverse and teachers must attempt for flexible and varied educational services as well (Isrotun, 2022). In its implementation, the Merdeka Curriculum prioritizes intracurricular learning with a differentiation strategy where learning is designed optimally for activities to strengthen competencies and deepen concepts (Pitaloka & Arsanti, 2022). Differentiation provides great opportunities for both students and teachers to carry out learning naturally and efficiently (Faiz et al., 2022). The implementation of differentiation directs students to learn independently, creatively, and think critically, a notion supported by Betts and Kercher (2023), who found that differentiated instruction significantly enhances students' self-directed learning and critical thinking skills (Kurniawati, 2024). Teachers have a big role in providing learning instructions (Herwina, 2021). If teachers are not ready to face new learning processes and environments, this will have an impact on reducing the quality of students (Putra et al., 2022).

Differentiation is a strategy that refers to students' talents and interests. Teachers are required to be innovative to produce quality learning (Suwandi et al., 2023). In practice, learning profiles are used to identify the things students like to learn. This concerns many factors, including gender, language, culture, health, family, and others (Andajani, 2022). One of the needs which is also students' main modality and preference while learning is learning style. These things have an important role because each student has their uniqueness. Learning style differentiation can be used so teachers do not generalize all students (Himmah & Nugraheni, 2023). Furthermore, differentiation plays a crucial role in developing students' higher-level thinking skills, as evidenced by studies such as those by Madhakomala et al. (2022), which highlight how tailored learning experiences promote critical analysis, problem-solving, and creative thinking.

Geography learning involves humans, nature, and their relationships in the complex and dynamic spatial context which is interesting to learn (Oktavian et al., 2023). In its implementation, students can learn geosphere phenomena in unique ways and involve other sciences from a Geography perspective (Putra et al., 2022). Technology can be used as a facility to grow learning motivation, and then produce effective and efficient learning (Putra et al., 2021). Geography learning equips students for global competition by enhancing their spatial thinking and global awareness, key competencies for navigating and understanding complex international dynamics and environmental challenges. The complexity requires an
The Effect of Geographical Inquiry... 

appropriate, efficient, and effective learning model (Putra et al., 2021). This can be realized through the Geographical Inquiry model.

Geographical Inquiry is a learning model that can occur through collaborative activities in class (Irawan, 2019). Students can formulate problems, design, carry out experimental activities, collect and analyze information, and draw conclusions independently (Yulianti, 2024). Geographical Inquiry can train students' literacy, communication, and critical analytical skills, enhancing their ability to interpret data, engage in meaningful discourse, and solve complex geographical problems (Nisa, 2022). Learning, particularly through the Geographical Inquiry model, necessitates critical thinking skills as essential for students to navigate future challenges effectively, underscoring the model's relevance and appropriateness in fostering these competencies (Wahyudi, 2019). The Geographical Inquiry model is synonymous with training students' critical thinking skills through learning steps that make it easier for students to understand the context of the learning subject because it is related to real life. Students can train their critical thinking skills and become more aware of their environment (Utami, 2021). Geographical Inquiry aligns with modern education by integrating digital technologies and adapting to various learning styles, making it an ideal model for today's diverse educational needs (Purnomo et al, 2023). However, the effect of implementing Geographical Inquiry integrated with differentiation strategy, especially learning style differentiation, is not yet known.

Today's learning requires students to have critical thinking skills (Umi et al., 2021). This is a 21st-century learning paradigm because, through critical thinking skills, students can understand real problems and make decisions in everyday life. But the fact is, in the field many students are classified as not having or lacking critical thinking skills (Turohmah et al., 2021). This gap in facts requires that teachers as facilitators have the ability to present learning based on higher-order thinking skills, especially critical thinking (Islam et al., 2021). To enhance students' critical thinking skills, a precise integration of Geographical Inquiry with learning style differentiation is vital, as it directly tailor content and methods to diverse cognitive needs, promoting deeper understanding and analytical thinking.

Geographical Inquiry learning based on learning style differentiation is realized through flora and fauna conservation efforts as learning material. The relationship between nature and humans in conservation efforts for flora and fauna is very close (Sundari, 2019). In this material, the surrounding environment is needed as a source of information (Robert, 2022). This material provides an opportunity for students to grow critical thinking because it requires students to explore knowledge and analyze problems in complex issues (Herawati, 2021). The development of digital technology encourages teachers to produce sustainable learning, provide valuable learning experiences, and have a positive impact (Putra et al., 2022). Geospatial technology makes it easier for students to study complex geosphere phenomena (Oktavian et al., 2023). Google Earth, as a geospatial technology, is utilized in classrooms to enhance learning by enabling students to perform spatial analysis, visualize geographic data, and explore real-world environments. This hands-on approach fosters a deeper understanding of geographical concepts and encourages interactive learning (Mutia et al, 2023).

Based on the introduction above, there is an opportunity for research success because of the relevant relationship between Geographical Inquiry and differentiation in learning styles on students' critical thinking skills. The experimental research aims to find out the effect of Geographical Inquiry based on differentiation strategies on learning styles on students' critical thinking skills,
especially in material on flora and fauna conservation efforts. The research looked at the comparison of data in 2 classes, namely the experimental class and the control class. It is hoped that this research will be able to provide a diversity of learning needs, especially student learning styles, and will be able to improve the quality of learning. Therefore, the research carried out was entitled “The Effect of Geographical Inquiry Based on Learning Style Differentiation on Students’ Critical Thinking Skills”.

METHOD

Research Design

This type of research uses a quasi-experimental method because the selection of research subjects is carried out in a structured manner (Hastjarjo, 2019). Measurements were carried out using a post-test-only control group design with a focus on comparing two groups of data (Nafis & Asiatun, 2019). Initial measurements were omitted based on the assumption that subjects from a single population would exhibit similar baseline characteristics, allowing for end-study assessments only. This approach, while streamlining the research process, acknowledges the assumption of homogeneity among subjects as a potential limitation that might affect the study's comparability and overall findings (Ratminingsih et al., 2020). The research used an experimental class and a control class. In the experimental class, the Geographical Inquiry model emphasized active problem-solving and tailored learning, while the control class followed conventional, lecture-based instruction without adaptation to individual learning styles. The research design is presented in table 1.

<table>
<thead>
<tr>
<th>Class</th>
<th>Treatment</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>X</td>
<td>O</td>
</tr>
<tr>
<td>Control</td>
<td>-</td>
<td>O</td>
</tr>
</tbody>
</table>


Research Subject

The research subjects were class XI IPS students at SMAN 1 Singosari odd semester of the 2023/2024 academic year. Subjects were divided into 1 experimental class and 1 control class. The purposive sampling technique was selected for its ability to specifically target classes matching the study’s criteria, ensuring relevant comparisons between experimental and control groups, which was crucial for examining the impact of Geographical Inquiry on critical thinking skills (Berndt, 2020). In this experimental research, research subjects were determined based on the average of the latest daily test score in Geography subject with data obtained from the Geography teacher at SMAN 1 Singosari. Through the data obtained, it is known that the average UH score for classes XI IPS A and XI IPS C is equal, namely 78. So class XI IPS A was determined to be the experimental class using the Geographical Inquiry model based on learning style differentiation and class XI IPS C to be the control class with conventional learning. Each class consists of 32 students.

Data Collection Techniques

Collecting research data through implementing post-test material on flora and fauna conservation efforts in both classes. The results obtained become data that is processed and analyzed to determine the effect of the Geographical Inquiry based on learning style differentiation on students' critical thinking skills. This
The effect is based on a comparison of the average post-test scores of the two classes. The average of daily score was used as a comparison and determination of research subjects.

**Research Instrument**

The research instrument is a post-test containing 5 activities related to material on flora and fauna conservation efforts. Each activity represents one of the critical thinking skills indicators in the following table.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Clarification</td>
<td>Students are able to identify or create questions, analyze arguments, and answer challenging questions</td>
</tr>
<tr>
<td>The Bases for A Decision</td>
<td>Students are able to check the relevance and credibility of the information data obtained and view student observations</td>
</tr>
<tr>
<td>Inference</td>
<td>Students are able to create and consider answers to the problems given</td>
</tr>
<tr>
<td>Advanced Clarification</td>
<td>Students are able to recognize and consider terms related to the assumptions that have been made</td>
</tr>
<tr>
<td>Supposition and Integration</td>
<td>Students are able to consider and think logically about each information data that has been processed, then examine the relationships within it and make predictions about the long-term effects of the decisions taken</td>
</tr>
</tbody>
</table>

Before the research learning process using a post-test instrument, the instrument was tested first using respondents from class XII IPS SMAN 1 Singosari with a score of $n$ is 30. The instrument test consists of the Pearson Product Moment validity test (Bivariate Pearson) and the reliability of Cronbach’s Alpha ($\alpha$) on the SPSS 25. The results obtained through the validity test are that the questions are declared valid with a sig value. (2-tailed) ≤ 0.05, namely 0.000 for activity codes number 1, 2, 3, and 5 and 0.007 for activity number 4. Then in the reliability test, the research instrument was declared reliable with a Cronbach’s Alpha value of 0.614 (> 0.6).

**Data Analysis**

The data analysis stage begins with prerequisite tests including normality tests and homogeneity tests as requirements for determining further data analysis through parametric/non-parametric statistical techniques. In the normality test of the Kolmogorov-Smirnov method with a confidence level of 95%, the results obtained were normally distributed data (sig. value > 0.05), namely with a sig. the experimental class was 0.074 and the control class was 0.131. In the Levene method homogeneity test, with a confidence of 95%, the result was that the data had a homogeneous variance because of the sig. value. > 0.05. By these results, research data analysis was continued using parametric statistical techniques.

The next stage is a t-test which aims to see the average difference between 2 groups of data and the effect between research variables through calculations according to the independent sample t-test in the SPSS 25 application with a confidence level of 95%. The results of the independent sample t-test show that there is an effect of Geographical Inquiry based on learning style differentiation on students' critical thinking skills based on the results of the post-test material on flora and fauna conservation efforts. Sig value. (2-tailed) was ≤ 0.05, in the experimental class it was 0.002 and in the control class it was 0.003. The average for the experimental class is 79.72 and the control class is 70.75, which
means the experimental class score is higher. This is suitable with the independent sample t-test decision.

**RESULT AND DISCUSSION**

**Result**

The research took place at SMAN 1 Singosari for three weeks from 2 October to 20 October 2023 with four meetings in each class. The research process in the experimental class was carried out to determine the effect of Geographical Inquiry based on learning style differentiation on students' critical thinking skills, while the control class applied conventional learning as a comparison. At the final stage of the research, each class carried out a post-test on material on flora and fauna conservation efforts as data collection and then analyzed using an independent sample t-test.

**Table 3.** Independent Sample T-Test Results of Critical Thinking Skills for Each Activity

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Achievement (Experimental)</th>
<th>Achievement (Control)</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Clarification</td>
<td>15.00</td>
<td>11.88</td>
<td>0.013</td>
</tr>
<tr>
<td>The Bases for A Decision</td>
<td>18.06</td>
<td>17.19</td>
<td>0.504</td>
</tr>
<tr>
<td>Inference</td>
<td>19.69</td>
<td>16.56</td>
<td>0.001</td>
</tr>
<tr>
<td>Advanced Clarification</td>
<td>9.44</td>
<td>6.59</td>
<td>0.005</td>
</tr>
<tr>
<td>Supposition and Integration</td>
<td>18.53</td>
<td>17.53</td>
<td>0.312</td>
</tr>
</tbody>
</table>

**Table 4.** Independent Sample T-Test Results for Critical Thinking Skills

<table>
<thead>
<tr>
<th>Class</th>
<th>Average</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>79.72</td>
<td>0.002</td>
</tr>
<tr>
<td>Control</td>
<td>70.75</td>
<td>0.003</td>
</tr>
</tbody>
</table>

By the results of the independent sample t-test post-test for flora and fauna conservation efforts, it was shown that the average value of the experimental class was higher for each activity. Sig value (2-tailed) on activities with indicators of “basic clarification”, “inference”, and “advanced clarification” showing a value of ≤ 0.05. Meanwhile, activities with indicators “the bases for a decision” and “supposition and integration” show a value of > 0.05. Sig value (2-tailed) overall both show results ≤ 0.05. Through these tests and results, it is known that there is an effect of Geographical Inquiry based on learning style differentiation on students' critical thinking skills.

**Discussion**

Geographical Inquiry is a learning model that involves students in higher-level intellectual activities (Putra & Masruri, 2019). Geographical Inquiry aligns with modern education by engaging students in real-world problem-solving and inquiry, fostering critical thinking and preparing them for 21st-century challenges, thus meeting contemporary educational needs (Wahyudi, 2019). Today's learning also prioritizes students' needs during the learning process through the Merdeka Curriculum (Cahyati Ngaisah et al., 2023). Experimental class research uses a Geographical Inquiry based on learning style differentiation and control class uses conventional learning as a comparison. The implementation of Geographical Inquiry refers to 5 syntaxes according to the Environment Science and Research Institute (ESRI) and the differentiation of learning styles as follows.
Table 5. Implementation of Geographical Inquiry Based on Learning Style Differentiation

<table>
<thead>
<tr>
<th>Syntax 1: Ask Geographic Questions</th>
<th>Description</th>
<th>Content Differentiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The teacher conveys the learning objectives and activities.</td>
<td>1. Fill out the learning style questionnaire as a diagnostic assessment for class division according to student learning styles (visual, auditory, and kinesthetic).</td>
<td></td>
</tr>
<tr>
<td>2. The teacher provides material on flora and fauna conservation efforts which includes definitions, criteria for selecting conservation areas, natural reserve areas and nature conservation, and conservation activities in the Sempu Island Nature Reserve along with presenting geographical data.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax 2: Acquire Geographic Resources</th>
<th>Description</th>
<th>Content Differentiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students access learning media on the LKPD “Upaya Konservasi di Cagar Alam Pulau Sempu”</td>
<td>1. Differences in content accessed by students regarding important values and activities at the Sempu Island Nature Reserve.</td>
<td></td>
</tr>
<tr>
<td>2. Students collect data and information from learning media to answer the geography questions they have created</td>
<td>2. Differences in instructions/activity details in the LKPD.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax 3: Explore Geographic Data</th>
<th>Description</th>
<th>Content Differentiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Students explore data/information by organizing it according to the instructions in the LKPD.</td>
<td>1. Differences in content accessed by students regarding important values and activities at the Sempu Island Nature Reserve.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Differences in instructions/activity details in the LKPD.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax 4: Analyze Geographic Information</th>
<th>Description</th>
<th>Content Differentiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students carry out further data/information analysis and answer questions.</td>
<td>1. Differences in content accessed by students regarding important values and activities at the Sempu Island Nature Reserve.</td>
<td></td>
</tr>
<tr>
<td>2. The teacher accompanies and provides direction so that the predicted answers are relevant to the geography questions being created.</td>
<td>2. Differences in instructions/activity details in the LKPD.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax 5: Act Upon Geographic Knowledge</th>
<th>Description</th>
<th>Content Differentiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students present the results of the investigation.</td>
<td>1. Visual: Infographic information data.</td>
<td></td>
</tr>
<tr>
<td>2. Students make learning conclusions on the material on flora and fauna conservation efforts.</td>
<td>2. Auditory: Comparative study material.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Kinesthetic: Presentation materials</td>
<td></td>
</tr>
</tbody>
</table>

1. Differences in Critical Thinking Skills in the Experimental Class and the Control Class

The results of the analysis show that there are differences between the experimental class and the control class. This leads to differences in critical thinking skills. The research utilized Student Worksheets (LKPD) tailored to both Geographical Inquiry and conventional learning methods. For the Geographical Inquiry approach, the LKPDs were customized to incorporate activities that matched students’ learning styles, promoting engagement through varied instructional strategies. Conversely, in the conventional learning setting, the LKPDs maintained a standard format, focusing on uniform content delivery without specific adaptations to individual learning preferences.

At the first meeting in the experimental class, the implementation of the differentiated learning began with the activity of filling a learning style
questionnaire. This aims to be a diagnostic assessment that contains questions related to students' preferences and habits when learning according to learning styles (Al-Hamzah & Awalludin, 2021). Student learning styles are grouped according to De Potter and Hernacki's theory, namely visual, auditory, and kinesthetic (Abi, 2020). The distribution of learning styles in the experimental class—14 visual, 11 auditory, and 7 kinesthetic—shaped a teaching approach that employed diverse strategies and materials, making the Geographical Inquiry activities more effective and engaging for all students.

In the subsequent session, the lesson guided by the Student Worksheets (LKPD) was titled 'Conservation Efforts for Flora and Fauna in Sempu Island Nature Reserve.' This session was structured to enhance critical thinking skills through various components: firstly, it introduced students to the important values of Sempu Island, fostering appreciation for environmental conservation. Secondly, it encouraged students to formulate geographical questions, promoting inquiry and problem-solving. Thirdly, the lesson examined the interplay between geosphere phenomena and conservation efforts, developing students' analytical skills. Fourthly, students analyzed geographical factors and data presentations related to Sempu Island, which enhanced their data interpretation abilities. Lastly, discussions on conservation strategies for flora and fauna were aimed at promoting evaluative and decision-making skills. Each component was carefully designed to train students in thinking critically about environmental issues, encouraging them to draw connections, analyze data, and make informed decisions regarding conservation efforts.

Students are expected to be able to find causal relationships between humans and nature within the geographic space. During the learning process, students' critical thinking skills continue to be trained starting from simple stages and continuing to increase to provide students with opportunities to think more deeply (Berjamai & Davidi, 2020). The LKPD is designed simply with the hope of being able to focus activities on stimulating students' critical thinking skills (Istni et al., 2022). Work on LKPD in the experimental class was carried out in groups according to the division of learning styles, while in the control class students were free to work in groups as in normal learning. The teaching media provided takes into account student preferences and contains learning sub-materials (Marlina, 2019).

In this study, students identified with visual learning styles, who process information best through sight, were provided with narrative media about 'Wildlife Release in Sempu Island Nature Reserve.' This choice aligns with visual learners' preferences for engaging with material through images and text, as narratives rich in descriptive imagery and written content can significantly enhance their understanding and retention. The detailed descriptions and visual cues within the narrative were specifically designed to cater to their strengths, allowing these students to vividly imagine the scenarios and thereby deepen their connection to the subject matter (Fendrik et al., 2022). Students with auditory learning style group refer to the sense of hearing for information and knowledge and tend to like media containing audio (Supit et al., 2023), so in this research, they were given media in the form of videos containing collection of documentation and recordings about some fauna conservation activities in Sempu Island. Students with kinesthetic learning style group refer to moving activities and like media that are creating or touching (Bire et al., 2019), so in this research they were given media in the form of the game "snowball throwing". Differentiation presents different
treatments that emphasize student fulfilment during learning, this does not change the learning objectives (Mahabbati & Handoyo, 2023).

In the control class, all students received uniform treatment through narrative media, irrespective of their individual learning styles. This narrative, detailing 'Wildlife Release in Sempu Island Nature Reserve,' was intended to provide a standard learning experience. However, without customization to cater to diverse learning preferences, the impact of this narrative media on learning varied. While it offered a base level of engagement through storytelling and visual descriptions, its effectiveness in fostering deep understanding and retention across the entire class may not have mirrored the tailored approach seen in the experimental class. This underscores the potential limitations of a one-size-fits-all educational strategy, especially in contrast to methods that adapt to the unique ways students absorb and process information.

Through activities to provide learning needs, especially learning styles, it can be observed that in the experimental class, students show a positive response. This positive response aligns with constructivist theories, particularly Vygotsky's social constructivism, which highlights how feeling valued, having individual learning needs met, and engaging in collaborative interactions can boost student engagement and motivation (Wahyuningsari et al., 2022). Each group is active and united in exploring the teaching media that has been provided. By extracting information data from learning media, activities are continued with activities that include indicators of critical thinking skills. Geographical Inquiry learning which is aligned with differentiated learning has been designed simply and focuses on each indicator of critical thinking skills. In a freedom to learn climate, teachers act as facilitators who continue to guide and monitor the development of each group with different needs (Daga, 2021).

The group in the control class with conventional learning received the same treatment and the students in the class were considered to have equal conditions. In these conditions, teachers tend to let students learn independently as the usual learning process. It can be observed that during tracing activities to practice, students tend to be less unified and enthusiastic. In analyzing the results, the more detailed responses from students in the experimental class, fulfilling the critical thinking indicators, can be directly attributed to the differentiated learning methods employed, which tailored the educational content and approach to their varied learning styles. Meanwhile the students from control class, the answers given were less detailed and did not fulfil the indicators of critical thinking skills. The higher values observed in the experimental class not only indicate the outcome of the analysis but also underscore the effectiveness of the differentiated learning approach in enhancing student outcomes.

2. The Effect of Geographical Inquiry Based on Learning Style Differentiation on Students' Critical Thinking Skills

The results from the experimental class reveal that Geographical Inquiry, combined with learning style differentiation, significantly improved students' abilities in analysis, judgment, and problem-solving within geographical contexts, directly enhancing key components of critical thinking. This is caused by several conditions. Using Geographical Inquiry students can deepen their understanding in the context of Geography (Simpson & Hulme, 2023). Time is allocated adequately for students in activities to collect, process, evaluate, and present data from geographical sources. Geographical Inquiry syntax motivates students to learn independently and is considered to provide opportunities for successful
learning. This approach specifically sharpens students' critical thinking skills in analyzing and solving problems related to flora and fauna conservation, highlighting the direct connection between enhanced analytical abilities and this particular subject matter.

Differentiation during the learning process emphasizes providing for students' needs during learning. Differentiation of learning styles can provide fast and good way for each student in the class when receiving lessons (Rizki Aulia Andany, 2020). The teacher groups the class into 3 types of learning styles. Students become more proactive and freely express ideas to achieve learning goals in the right way. Students with the same preferences joining in the same group makes the learning process more effective (Pitaloka & Arsanti, 2022). The concept of differentiation in research focuses on differences in content, processes, and products. Content differentiation considers student needs, process differentiation reflects students' styles and preferences when learning, and product differentiation reflects understanding and variations in the class (Marlina, 2019). By learning style as a learning need that is considered for differentiated learning, there are differences in the use of teaching media, instructions in LKPD, and work results. The differences in student expressions were shown by making infographics for the visual group, comparative studies for the auditory group, and presentations for the kinesthetic group. Diversity in the classroom indicates that there is freedom to learn.

As for the effect seen through comparing the analysis results on each indicator of critical thinking skills, the “inference” indicator with activity code number 1 on the LKPD shows the most significant effect. This is proven by the average score of the experimental class having a difference of 3.13 points higher than control class. During observations on the research, the activities provided contained detailed information about the important value of the Sempu Island. The students’ task was to conclude the information through findings in learning media. Meanwhile, the indicator “the bases for a decision” with activity code number 3 shows the smallest effect with a comparison of the scores for the two classes only 0.87 points. The smaller effect on the ‘bases for a decision’ indicator could be due to its complex nature, requiring deeper analytical skills or prior knowledge that students might not have fully developed, or possibly because the teaching and assessment methods were less aligned with students' learning styles and the intricacies of conservation decision-making. The activities provided are in the form of observing geosphere phenomena. The findings obtained during the research were that students needed apperception activities about geosphere phenomena. This material has been taught at previous grade.

Through experimental class learning activities using the Geographical Inquiry model, it is known that the syntax “explore” and “analyze” have the greatest effect. Both syntaxes contain information exploration and analysis activities that are guided by LKPD and focus on process differentiation. Activities to train critical thinking skills which include all 5 indicators are deployed at this stage. The research uncovered a range of findings highlighting how Geographical Inquiry, tailored to learning style differentiation, specifically impacts various aspects of students' critical thinking and engagement. Based on the results of the research data test, it is known that there are differences in the results of the two classes, both through the average value and the sig value. (2-tailed). The experimental class is a class uses the Geographical Inquiry based on learning style differentiation. The control class is a class uses the conventional learning as comparisons. The overall average score in the experimental class was higher,
through these results, it was determined that Geographical Inquiry based on learning style differentiation had the effect on students' critical thinking skills compared to conventional learning in Geography subjects.

**CONCLUSION**

The findings in the research are in the form of a comparison that the value of the experimental class is higher. The comparison was made through the results with the subjects of XI IPS students at SMAN 1 Singosari odd semester of the 2023/2024 academic year who had been tested using the parametric statistical technique of the independent sample t-test. It is known that Geographical Inquiry based on learning style differentiation has the effect on students' critical thinking skills with a sig value. (2-tailed) amount ≤ 0.05. This effect can arise due to the integration of the Geographical Inquiry model which supports students' thinking skills with differentiated learning which prioritizes meeting learning needs, especially learning styles. There are variations in expressions as responses that indicate freedom in learning. As an implication, this research can be used as a reference and direction for future research that is related to the use of the Geographical Inquiry model, differentiated learning, student learning styles, as well as material for flora and fauna conservation efforts.

The suggestion to diversify the use of geospatial technology and teaching media stems from the need to cater to the broad spectrum of learning styles present in a classroom. Incorporating a wider array of geospatial tools and varied teaching materials can enhance engagement, facilitate personalized learning experiences, and foster a deeper understanding of geographical concepts. This approach not only supports the principles of differentiated learning by providing options tailored to visual, auditory, and kinesthetic learners but also leverages the immersive potential of technology to bring complex geographical phenomena to life, making the learning process more interactive and impactful. The hope is that the needs and preferences of students in the classroom when studying will be given more attention and will be able to produce independent and quality learning.

**REFERENCES**


AUTHORS

Mentari Pradi Galih Nurani, is a student of the Geography Education undergraduate program, Department of Geography, Faculty of Social Sciences, Universitas Negeri Malang, Malang, Indonesia (email mentari.pradi.1807216@students.um.ac.id).

Budi Handoyo, is a lecturer at the Department of Geography, Faculty of Social Sciences, Universitas Negeri Malang, Malang, Indonesia. He has expertise in the field of Geography learning. As a lecturer, he has participated in research
Nurani, dkk

and community service activities, as seen from the number of articles, books, copyrights, and others (email budi.handoyo.fis@um.ac.id).

Salman Rashid, is affiliated with the National University of Modern Languages in Pakistan, indicating a professional or academic relationship with one of the country's prominent institutions specializing in language studies and possibly other modern disciplines. This connection suggests that Mr. Rashid may be engaged in academic pursuits, research, or teaching within the university's framework (email salrashid@numl.edu.pk).

Lisa Nikita Meilana, is a geography teacher at Senior High School 1, Singosari, indicating her pivotal role in imparting geographical knowledge and fostering an understanding of Earth's systems and societies among high school students. Her position as a geography educator suggests a deep commitment to developing students' critical thinking and spatial awareness (email lissanikitameilana@gmail.com).