

THE ROLE OF THE ENVIRONMENT AS A SOURCE OF GEOGRAPHY LEARNING ON THE SPATIAL THINKING OF GRADE X STUDENTS AT SMA BK PALU

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Abstract

This study aims to determine the role of the environment as a source of geography learning on the spatial thinking of tenth-grade students at SMA BK Palu. Quantitative descriptive research is an approach that was implemented in this study, with a total of 61 students consisting of 25 students from class XA, 21 students from class XB, and 15 students from class XC, who were used as research subjects. Data collection was conducted through tests, observations, and limited interviews. The research instruments consisted of an objective multiple-choice test with 15 questions on spatial thinking indicators, observations to determine the learning process in the classroom, and interviews with students about the use of the environment as a learning resource. The results indicate that the spatial thinking abilities of students in classes XA and XB are better than those in class X C. This can be seen from the dominance of students in the good and very good categories in classes XA and The results of the observation also indicate that learning in classes XA and XB has linked the material to the surrounding environment while in class XC the use of the environment as a learning resource has not been optimal. In addition the interview results indicated that the material will be easier for students to understand when learning is linked to the surrounding environment. The study concluded that the role of the environment as a source of geography learning for spatial thinking among tenth grade students at SMA BK Palu has not been applied even across classes. It is recommended that teachers consistently improve the implementation of environment-based learning and that future researchers develop similar studies in different learning contexts.

Kata Kunci:

Lingkungan; Geografi; Sumber Pembelajaran; Berpikir Spasial

Abstrak

Penelitian ini dilakukan dengan tujuan agar peran lingkungan sebagai sumber pembelajaran geografi terhadap berpikir spasial siswa kelas X di SMA BK Palu bisa diketahui. Penelitian deskriptif kuantitatif merupakan pendekatan yang diimplementasikan dalam studi ini, dimana ada sebanyak 61 siswa yang dijadikan sebagai subjek penelitian yang memuat kelas X A berjumlah 25 siswa, X B berjumlah 21 siswa dan X C berjumlah 15 siswa. Pengumpulan data dilakukan melalui tes, observasi dan wawancara. Instrumen penelitian berupa tes objektif pilihan ganda sebanyak 15 butir soal berdasarkan indikator berpikir spasial, observasi guna mengetahui aktivitas pembelajaran yang berlangsung dikelas, serta wawancara dengan siswa terkait pemanfaatan lingkungan sebagai sumber

belajar. Berdasarkan hasil penelitian, kemampuan berpikir spasial siswa kelas X A dan X B lebih unggul dibandingkan dengan siswa kelas X C. Hal ini tercermin dari banyaknya siswa yang terklasifikasi pada kategori baik dan sangat baik dikelas X A dan X B sedangkan pada kelas X C masih ditemukan sejumlah siswa yang cukup besar pada kategori sangat kurang. Hasil observasi juga memperlihatkan bahwa pembelajaran di kelas X A dan X B sudah mengaitkan materi dengan lingkungan sekitar, sedangkan pada kelas X C pemanfaatan lingkungan sebagai sumber pembelajaran belum optimal. Di lain sisi, temuan wawancara memperlihatkan bahwa materi akan lebih mudah dipahami oleh siswa saat pembelajaran dikaitkan dengan lingkungan sekitar. Penelitian menyimpulkan bahwa peran lingkungan sebagai sumber pembelajaran geografi pada berpikir spasial siswa kelas X di SMA BK Palu belum diterapkan secara merata antar kelas. Disarankan kepada guru untuk meningkatkan penerapan pembelajaran berbasis lingkungan secara konsisten, serta bagi peneliti selanjutnya untuk mengembangkan penelitian sejenis pada konteks pembelajaran yang berbeda

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INTRODUCTION

High-level thinking skills such as critical, creative, communicative, and collaborative thinking are essential for students in the 21st century to cope with rapid advances in science and technology (Aulia et al., 2023). Therefore, 21st-century learning activities need to be structured actively and contextually, so that students not only receive information but also process and interpret it. connect it with real conditions in the surrounding environment (Lestari & Iryanti, 2024). This type of learning encourages students to understand phenomena through spatial aspects, object relationships, and patterns in everyday life, as part of the development of their spatial thinking. Developing spatial thinking skills is crucial for students' ability to analyze and interpret phenomena in a comprehensive and meaningful way (Astawa, 2022).

Spatial thinking is closely related to the environment because it can help students understand spatial patterns and relationships within it. between objects and the reality they encounter (Buana & Putra, 2023). The environment supports spatial thinking skills by providing real-world examples, such as residential layouts, transportation routes, and vegetation patterns. Through the environment as a learning resource, students become accustomed to analyzing the relationships between objects in space and time (Wijaya et al., 2023). This teaches students to represent what they observe around them in other, more easily understood forms, such as maps or floor plans (Dewi et al., 2021). The environment provides

a space for analyzing geographic phenomena, practicing spatial thinking skills, and developing a critical and systematic understanding of space (Nisnala et al., 2023).

The environment plays a crucial role in geography learning, as students can better understand natural and social phenomena in everyday life through fieldwork alongside classroom learning. For example, by using an environment-based approach to studying natural disasters, students can gain a more concrete understanding of how these phenomena occur. As a subject that examines the reciprocal interactions between various elements on the Earth's surface, geography can be more easily understood by students. This aligns with the definition of geography as a science that studies the similarities and differences between geospheric phenomena through environmental, regional, and spatial perspectives (Irnawati et al., 2023)

The problem faced in geography learning today is the continued emphasis on memorizing facts and concepts. The learning process is often textbook-centered or overly reliant on textbooks, resulting in fewer opportunities for contextual learning, less practice, and less direct field experience for students. Efforts to achieve geography learning goals are difficult. This situation makes it difficult for students to understand, explain, and apply concepts. and analyzing geosphere phenomena and linking concepts to real conditions (Listiqowati, 2025).

In general, the problem encountered in geography learning in grade 10 of SMA BK Palu is that the teacher still dominates learning activities. On the other hand, practical activities in geography learning have not been implemented optimally. The use of the surrounding environment as a resource for learning geography has also not been fully maximized, even though it can serve as an effective tool for helping students understand geographic concepts. Furthermore, limited learning facilities at school also pose an obstacle to supporting geography learning oriented towards developing students' spatial thinking skills.

Initial observations in the 10th grade at SMA BK Palu indicate that lectures and question-based assignments remain the mainstays of geography learning. Teachers have not routinely implemented practical activities outside of class, for example, on hydrology material. Interviews with geography teachers revealed that approximately 70% of students understood the map-related material, but some still struggled with calculating map scales, understanding cardinal directions, and explaining map information. Teachers also cited limited learning facilities, such as limited infocus, as a barrier to geography instruction. Furthermore, the use of the school environment as a learning resource, such as through observational activities, has not been fully incorporated into learning activities.

Research by Mandasari et al. (2024) shows that the environment serves as an educational tool that can shape students' spatial attitudes and behavior. On the other hand, research by Cholifah & Alfi (2022) also shows that providing students with practice in real learning activities helps them understand space and analyze their surroundings. The urgency of this research lies in the importance of strengthening spatial thinking skills as a core competency in geography, which has not been fully realized through engagement with the surrounding environment. Unlike previous research, this study focuses on the relationship between using the environment as a learning resource and students' spatial thinking skills at the high school level, especially at SMA BK Palu, which has not been widely studied. This research was conducted to analyze the use of the environment as a source of geography learning for spatial thinking skills among grade 10 students at SMA BK Palu.

METHOD

Descriptive quantitative research is the approach implemented by this study. SMA BK Palu, Palu City, Central Sulawesi Province, in the even semester of the 2025/2026 academic year, was chosen as the location for this research. The selection of SMA BK Palu as the research location, rather than other schools, was based on several considerations. First, the school is located in a densely populated residential area with a complex spatial pattern, which has the potential to serve as a learning resource for observing real-world geographical phenomena and training students' spatial analysis skills. Second, based on initial observations and interviews with geography teachers, it was found that the use of the school environment as a source of geography learning has not been optimally implemented.

The tenth-grade students, consisting of three classes: 25 students in class XA, 21 in class XB, and 15 in class XC, were selected as the research subjects, with a total of 61 students. The focus on class X was chosen because at this level, students are introduced to the basic concepts of mapping and spatial skills. This focus on one level aims to see how observing the surrounding environment serves as an initial stimulus in shaping students' spatial thinking structures before moving on to the material. Geography becomes more complex at the next level. Primary data were collected through a 15-item multiple-choice test to assess students' spatial thinking skills, classroom observations to examine teacher-student learning activities, and interviews with students about the use of the environment as a learning resource. Several supporting sources, such as literature from books, journals, articles, and other references, can be used as secondary data sources. The 15 multiple-choice questions, as an objective test, were structured based on the following spatial thinking skills measurements and were used as research tools:

Table 1. Spatial Thinking Indicators

Spatial Thinking Indicators	Spatial Thinking Indicators
Comparison	The ability to compare locations based on similarities and differences
Aura	Shows the unique influence or impact of a region on the surrounding areasurrounding area
Region	The skill of recognizing places that have similar characteristics and then grouping them into one unit.
Hierarchy	Describes locations that correspond to certain levels or hierarchies in an area
Transition	The ability to analyze regional changes that can occur suddenly, gradually or irregularly.
Analogy	Find other areas with similar positions that have almost the same conditions
Pattern	Describes the pattern or structure of a phenomenon or condition that appearsin aarea
Association	Predicting the tendency for two symptoms to appear together at the same location.

Source: (Kurniawan, 2022)

Next, student test results can be calculated by using the following formula as a technique for analyzing data:

Value = $\frac{\text{The score that Score obtained}}{\text{Maximum}} \times 100\%$

After getting the calculation results using the formula, adjust them to Table 2 below to provide score categories for the five criteria in the aspect of students' spatial thinking abilities as follows:

Table 2. Categories of Students' Spatial Thinking Ability Scores

Average Score of Students' Spatial Thinking Ability	Value Category
80 - 100	Very good
66 – 79	Good
56 – 65	Enough
40 – 55	Not enough
30 - 39	Very less

Source: (Alnursa & Saleh, 2024)

RESULTS AND DISCUSSION

Results

This study was conducted to determine the role of the environment as a source of geography learning in the spatial thinking skills of 10th-grade students at SMA BK Palu. The results were obtained by processing data on students' spatial thinking skills, which were classified into the following categories: very good, good, sufficient, less, and very less.

1. Class XA Research Results Data

The following table presents research data related to the spatial thinking abilities of class XA students obtained from test results:

Table 3. Spatial Thinking Ability of Class XA Students

Class Xa			
No.	Number	Category	Number Of Students
1	80-100	Very well	7
2	66-79	Good	8
3	56-65	Enough	4
4	40-55	Not enough	4
5	30-39	Very less	2
Amount			25

Sources: Research (2025)

Based on Table 3, the spatial abilities of class XA students tended to fall into the good and very good categories. Of the 25 students, 7 were classified as very good and 8 as good. On the other hand, 4 students were classified as sufficient and 2 as very poor.

2. Class XB Research Results Data

The following table presents the research data on the spatial thinking abilities of class XB students obtained from the test results:

Table 4. Spatial Thinking Ability of Class XB Students

Class Xb			
No.	Number	Category	Number Of Students
1	80-100	Very Well	4
2	66-79	Good	8
3	56-65	Enough	5
4	40-55	Not Enough	3
5	30-39	Very Less	1
Amount			21

Sources: Research (2025)

Based on Table 4, the spatial abilities of class XB students tended to fall in the good and very good categories. Of the 21 students, 4 were classified in the very good category and 8 in the good category. Furthermore, 5 students were classified in the sufficient category, 3 in the less category, and 1 in the very least category.

3. XC Research Result Data

The following table presents research data related to the spatial thinking abilities of class XC students obtained from test results:

Table 5. Spatial Thinking Ability of Grade XC Students

Class Xc			
No.	Number	Category	Number Of Students
1	80-100	Very Well	3
2	66-79	Good	5
3	56-65	Enough	0
4	40-55	Not Enough	2
5	30-39	Very Less	5
Amount			15

Sources: Research (2025)

Based on Table 5, the spatial abilities of class XC students tended to fall in the good and very good categories. Of the total 21 students, 3 were classified as very good and 5 as good. On the other hand, 2 students were classified in the poor category, and 5 in the very poor category.

Discussion

The results of data processing on students' spatial thinking abilities in classes XA, XB, and XC show clear differences. Better spatial thinking abilities tend to be demonstrated by classes XA and XB than by class XC. This is evident from the dominance of students in the good and very good categories. In the classroom, XA and XB classes, while in XC class, there was still a large number of students in the very poor category. This condition indicates that students in XA and XB classes better understand and analyze the concepts of space and the relationships among geographical phenomena than students in the XC class.

The differences in spatial thinking abilities across classes indicate that the use of the environment as a learning resource has been inconsistent. In classes with relatively lower spatial thinking abilities, it can be assumed that student involvement in learning activities is lower. Learning environment-based learning is still limited. However, the environment holds great potential as a learning resource because it encompasses physical and social aspects closely related to students' lives, enabling concrete and meaningful learning experiences (Anindita & Sidabutar, 2020). Students' spatial thinking skills, classified as good and excellent, demonstrate that the environment serves as an effective tool for practicing the process of imagining, comparing, and analyzing spatial conditions.

This aligns with the view of Febrianto et al. (2021), who stated that the ability to understand natural elements, present information through representation, and reason based on aspects of spatial thinking is part of spatial thinking. Through direct observation of the environment, students gain visual stimuli that help them develop deeper spatial reasoning. Furthermore, spatial thinking is a key characteristic of geography learning because it requires

integrating spatial concepts, spatial representations, and spatial-based decision-making (Viona & Ahyuni, 2024). The environment, as a learning resource, offers a variety of physical and social phenomena that can be analyzed, enabling students not only to understand the material abstractly but also to relate it to real-world situations. Therefore, environment-based geography learning helps build a more comprehensive spatial understanding.

On the other hand, the results of observations of geography learning in classes XA, XB, and XC show differences in ability. Thinkspatial when the material is linked to the surrounding environment. In class XA, some students can understand the concept of space when the material is associated with the surrounding environmental conditions. However, some students still cannot connect the concepts of location, distance, and relationships between spaces. In the classroom, students appeared quite responsive in participating in the lesson, especially when the teacher provided examples related to their surroundings. The relationship between spaces tended to be more easily understood by students with good spatial thinking skills.

In contrast, others still needed guidance. In the classroom, some students still struggle to understand spatial aspects of geographical concepts. Using the surrounding environment as a learning resource is not optimal, so students are less able to connect the material to real-world situations.

Conceptually, spatial thinking is part of the cognitive process that involves the ability to form, process, and interpret visual-spatial information in a spatial context (Kurniati et al., 2021). In geography, this ability is crucial because students must understand the relationships among objects, locations, and phenomena on Earth's surface. The findings of this study indicate that students who learn by using their surroundings as a learning resource tend to be better able to understand concepts of space, position, and the relationships among geographic phenomena than students who learn solely from classroom explanations.

Based on an interview with one student, geography learning is easier to understand when the material is directly related to the surrounding environment. Respondents stated that examples from real-life situations help visualize spatial concepts and the relationships between regions. The student also revealed that contextual explanations make the material feel clearer and less theoretical. This statement illustrates a more meaningful learning experience when the material is connected to environmental situations familiar to students.

In line with Aslinda (2020), the environment is also seen as a laboratory. Nature is an important aspect of geography learning, as it allows students to directly observe, analyze, and interpret phenomena in the field. Through contextual learning in their surroundings, students

can practice elements of spatial thinking, such as recognizing similarities and differences between regions, understanding the relationships between locations, and identifying poles of phenomena occurring in a given location. This process helps students gradually and sustainably develop spatial thinking skills.

The relationship between the environment and spatial thinking becomes increasingly apparent when students are confronted with real-world problems requiring spatial analysis. Learning that connects environmental conditions encourages students to visualize space, understand cause-and-effect relationships between locations, and consider distance and regional interconnectedness in decision-making (Cahyanti et al., 2023). Therefore, students' spatial thinking skills can be developed and enhanced through the environment's crucial role as a backdrop for learning.

CONCLUSION

Research findings show a clear difference in students' spatial thinking abilities across classes XA, XB, and XC. Classes XA and XB tend to have superior spatial thinking abilities to class XC. This is evident from the dominance of students in the good and very good categories. In the classroom XA and class XB, while in class XC, there was still a large number of students in the very poor category. Differences in spatial thinking skills across classes indicate that the use of the environment as a learning resource has not been implemented evenly. This demonstrates the importance of active student involvement in environment-based learning activities to maximize the environment's potential as a learning resource. In this regard, Students' spatial thinking skills in geography learning can be developed through the important role of the environment, which also provides a background for learning.

SUGGESTION

Geography teachers are expected to use the findings of this study as a reference in implementing environment-based learning to support students' spatial thinking skills, as well as for future researchers to develop similar research in different learning contexts.

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