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Transforming Local Potential: The Jasper Stone Park Area as a Geographic Learning Resource for High School Students

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ABSTRACT

This research seeks to enhance active learner participation and thinking skills geography by exploiting the geographic learning opportunities presented in the physical setting of Jasper Stone Park. The study was conducted using a field study mixed methods approach with qualitative and quantitative components using local observations, interviewing experts, and GIS spatial analysis. Jasper Stone Park was selected for this case study because the park's geological features and history are ethnically and environmentally diverse. The learning module developed included interactivity and therefore students were actively engaged in the material. The results prove that students' comprehension of geographical concepts as well as critical thinking skills are deepened. The research highlights the effectiveness of the incorporated local materials as resources of instruction and suggests a new direction of interdisciplinary curriculum and educational policy design. Moreover, the results justify the incorporation of local materials into geography lessons and make a case for the application of this strategy in other geographical areas. Future research could investigate the long-term impact of the developed learning module on students' geographical understanding and critical thinking skills.

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1. Introduction

With advancements in technology, geographic education is at the forefront of receiving necessary value. For example, studies indicate that significant interactions between students and education at all levels lead to improved cultural elements and geographically relevant focus in education (Miftakhul Rizqi et al., 2023; Pratiwi, 2024). As in most countries, Indonesia has also put considerable effort into infusing the local context into educational materials, aiming to build relevance from students' everyday experiences and increase their participation (Baili et al., 2024; Megavitry et al., 2023). Learning resources are more than just the information to be offered but serve as a means to students deeply understand and think critically about the issue at hand. More than ever, the world is facing new, multidimensional challenges in education. Therefore, there is a significant need for local learning resources that tackle global issues and vice versa.

A myriad of challenges around the world have argued for a movement towards more context-rich learning. Jones and Patel argue that Finland and Canada have improved geography pupils are taught because students are now able to solve local environmental problems within a wider international context (Kurniawan et al., 2023; Vega, 2022). These examples demonstrate the need to incorporate local materials when teaching geography, as well as to prepare students to deal with global problems related to the environment and sustainable development.

Transforming local potential into educational resources in geography education is especially promising. Educators can use the geographical and cultural characteristics of a region, such as the attributes of Jasper Stone Park, to improve education within the area. Jasper Stone Park can serve as a rich case study for utilizing the local potential in enhancing geography education because of its rich geological features and significance. However, geography education is currently not well-practiced. Students in geography classes are often not interested in the world around them, and traditional methods of instruction, which heavily rely on textbooks, do not do geography as a subject justice (Beneker et al., 2015). Such a lack of connection between the theory and practice of geography has increased the demand gap for educational resources that make geography more relevant and interesting for students.

While there are advantages to incorporating local potential in education, this aspect of the geography curriculum is often omitted. The abundance of unique local geographical features and culture is clearly not capitalized upon in the existing educational framework. This creates a gap for tools that not only seek to

provide theoretical knowledge but also help students employ this knowledge in their locality to enhance understanding and critical thinking skills. Studies have shown that students have a much greater capacity to analyze and solve geographical problems when learning materials are related to the local environment (Kusumawati & Mukminan, 2019).

The current study sought to analyze a particular geographical area, Jasper Stone Park, and its potential as a learning resource. We selected Jasper Stone Park for our case study because of its unique combination of geological formations, such as columnar jointing and fossil-rich layers, and its cultural heritage, including indigenous settlements and historical landmarks. These features offer a rich context for integrating local potential into geography education and provide opportunities for students to meaningfully engage with diverse geographical concepts. The primary aim of this study is to develop an effective approach for utilizing this local potential in the geography curriculum. This study addresses a significant research gap in the existing literature on geography education, which often overlooks the potential of local environments as learning resources and tends to focus on traditional textbook-based approaches (Hammond & Healy, 2022; Lambert et al., 2015). The objective of this study is to explore how critical thinking can be developed in a way that is contextually relevant and culturally sensitive while enabling students to think globally. The expectation of this research is that it will serve some purpose in the debate on educational innovation and curriculum change.

This research has effects that go beyond educational aspects. The study intends to recognize Jasper Stone Park and other locations as part of the geography curriculum, specifically for secondary school students (grades 10 -12), so that the places can be put to better use and unite local identity with the effort to save nature and culture. By focusing on this specific age group, learning resources and pedagogical approaches can be tailored to developmental needs and learning objectives. The results of this research should inform and guide educational practices and policies regarding curriculum development and, subsequently, geography education for secondary students worldwide (Beneker et al., 2015; Gong et al., 2021).

2. Method

2.1. Research Design

This study adopted a mixed-methods design that integrates qualitative and quantitative approaches to understand the potential of Jasper Stone Park as a learning resource within a geographical context (Beneker et al., 2015; Falótico et al., 2024). The selection of mixed methods is justified by the need to capture both tangible and intangible aspects of the park's educational value. The qualitative approach allows for an in-depth exploration of the community's perceptions and experiences related to the park's cultural and historical significance using methods such as interviews and focus groups to gather rich, descriptive data. On the other hand, the quantitative approach focuses on measuring and analyzing a park's physical features and their potential for educational use, employing methods such as GIS spatial analysis and field observations to generate numerical data. By combining these approaches, this study aims to provide a comprehensive understanding of how the Jasper Stone Park can be effectively utilized as a learning resource.

This study seeks to answer the following research questions:

RQ 1 : How can the unique geological and cultural features of Jasper Stone Park be effectively incorporated into geography education?

RQ 2 : What are the community's perceptions of the educational value of Jasper Stone Park?

RQ 3 : How can the use of Jasper Stone Park as a learning resource enhance students' understanding of geographical concepts and critical thinking skills?

A case study of Jasper Stone Park was selected because its prominent geological features and cultural significance create a unique environment for geography education. The park serves as an example of how local resources can be leveraged to enhance educational practice. Empirical studies support the successful utilization of the contextualized learning paradigm, where students are actively engaged and able to apply higher-order thinking skills, making Jasper Stone Park a relevant research site.

2.2 Data Collection

Field observations were designed to capture Jasper Stone Park's physical features and cultural attributes that are educational in scope. Combining interviews with local experts and analyzing geographic GIS data systems allowed for greater depth. The planning stages of this study relied on a mixed-method approach that stems from field observations combined with In addition, semi-structured interviews with park managers, local historians, and teachers were conducted to understand the educational significance of the region's history and purposes. Additionally, GIS aids were employed during spatial analysis to understand the geography teaching opportunities provided by the park.

The qualitative approach in this study aimed to gain an in-depth understanding of the cultural and historical significance of Jasper Stone Park and its perceived educational value in the local community. Semi-structured interviews were conducted with the park managers, local historians, and teachers. These interviews allowed for a deeper exploration of their experiences, perspectives, and knowledge of the park. The qualitative questions used in the interviews were as follows.

Can you describe the cultural and historical significance of Jasper Stone Park?
How do you perceive the educational value of the park?
What are some of the ways in which the park can be used to enhance geography education?
What are the potential benefits and challenges of using the park as a learning resource?

These open-ended questions allowed participants to share their insights and perspectives freely, providing rich and detailed qualitative data. The data collected through these interviews were then analyzed using thematic analysis to identify recurring themes and patterns related to the park's educational potential and its role in the community.

The quantitative approach focused on measuring and analyzing the physical features of Jasper Stone Park and their suitability for educational purposes. This involved using GIS spatial analysis was used to map and analyze the park's geological formations, topography, and other relevant features. Field observations were also conducted to gather quantitative data on specific aspects of the park, such as the size and distribution of different rock types, presence of water bodies, and accessibility of different areas within the park. The quantitative data were then analyzed using descriptive statistics and spatial overlay techniques to identify key geographical features that could serve as educational resources. By combining these qualitative and quantitative approaches, this study provides a comprehensive understanding of Jasper Stone Park's potential as a learning resource for geography education.

2.3 Informants, Population and Sampling

This research is concerned with the region of the Jasper Stone Park found in the Cimedang River Basin. This region was chosen because of its geographic and cultural value, which makes it an ideal case for analyzing how local potential is integrated into geography education. This region was chosen because of its geographic and cultural value, which makes it an ideal case for analyzing how local potential is integrated into geography education. In particular, the park's diverse geological formations, such as the unique presence of Jasper Stone, which is not found in several other areas in Tasikmalaya, provide opportunities for students to learn about geomorphological processes and landform development, while its rich cultural heritage, including community agricultural activities and tourism development potential, allows exploration of human-environment interactions and cultural landscapes. These features align with the key learning objectives in geography education, such as understanding physical processes, spatial patterns, and the relationship between humans and their environment. The park has a wide range of geological features, cultural sites, and environmental conditions that create a broad framework for educational activities. The position of the site within the river basin adds further intricacies to the study, encompassing river movement, erosion, siltation, and watershed management.

Informants, in this study, the informants consist of: 1) Head of Cibuniasih Village, Pancatengah District, Tasikmalaya Regency, 2) Representatives of community leaders in the Jasper Park area, and 3) Principal of SMAN 1 Cikatomas, Tasikmalaya Regency, as one of the schools adjacent to the research object.

Populasi and Sampling, the sample consisted of specific locations and features within the park that were selected based on their relevance to the research questions and their representativeness of the overall park environment. The sampling method in this research was to implement a purposive sampling technique to guarantee that individuals with the necessary skills and knowledge were included as respondents. Participants were selected based on their participation in the park, their position concerning educational activities, and their understanding of the area's history and geography. The population and sample of this study can be seen in Table 1.

Table 1. Population and Sample Distribution

Group	Population Size	Sample Size	Criteria for Selection
Park Managers	10	5	Involvement in park management and conservation
Local Educators	20	10	Experience in teaching geography with an emphasis on local content
Community Members	50	15	Knowledge of the park's cultural and historical significance

Geographical Context: The study area, Jasper Stone Park, is situated within the Cimedang River Basin (see Figure 1). The park and surrounding region consist of key components such as the river, geomorphological features, and anthropological monuments, all of which are depicted in the map. Due to the geographical variety of the region, the area is rich in learning resources and serves as an excellent case study for this research.

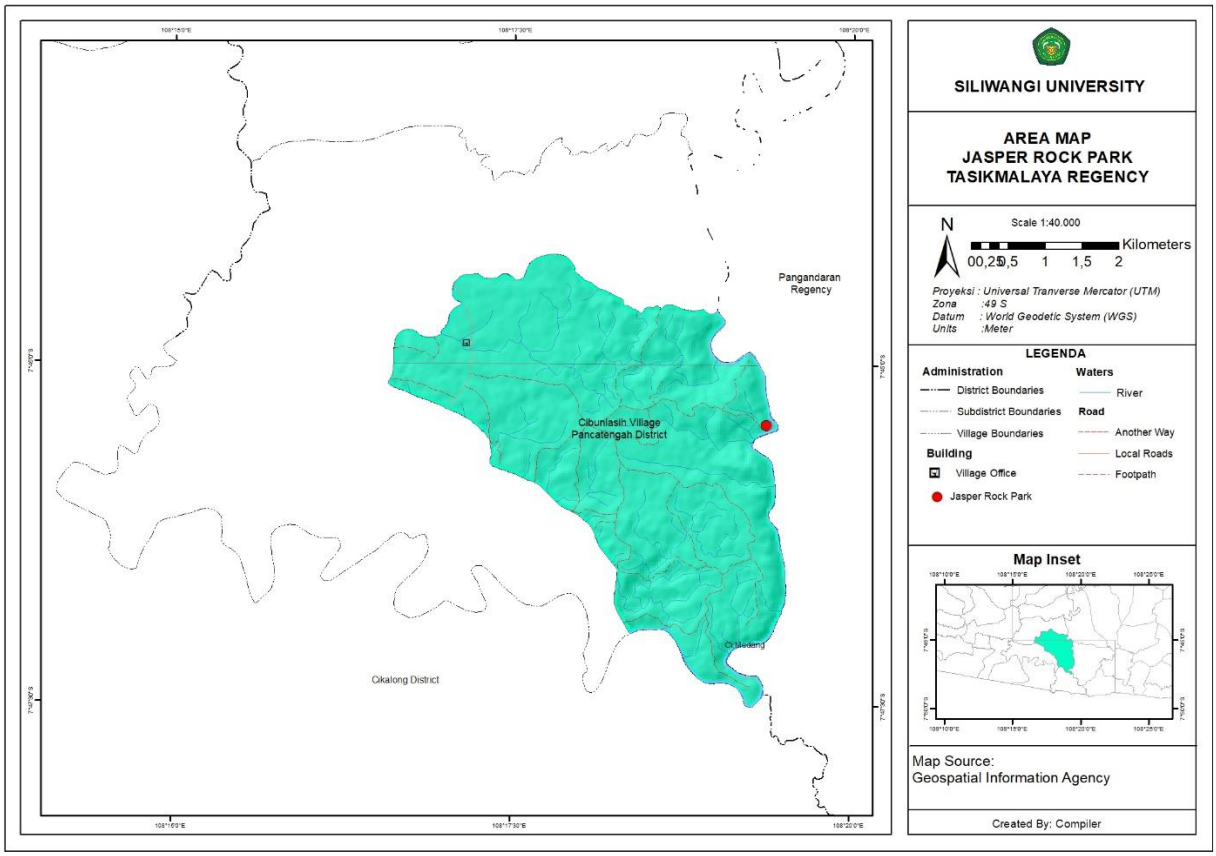

Figure 1: Map of Jasper Stone Park and Cimedang River Basin

2.4 Data Analysis

We performed statistical analyses of the quantitative elements and used thematic analysis for qualitative data. Descriptive statistics included analysis of spatial overlays with GIS-derived data and field measurements. The descriptive statistics aimed to reveal the major geographic features imposed within Jasper Stone Park, which can be utilized for teaching. Thematic analysis was applied to the interview data by defining the concepts and coding associated with the educational value of the park. Spatial analysis is very important for identifying the best places in the park where students can be taught geography by directly using the subject matter, employing satellite image overlaying, and location scoring techniques. These techniques enabled a thorough assessment of the park as a potential geography teaching resource that includes both physiographic and sociocultural aspects within the teaching context (Holler, 2019; Lin et al., 2022).

The quantitative data used in this study were derived from various sources, each of which contributed to a different aspect of the research. First, GIS spatial analysis generated data on the park's geological formations, topography, and land-use patterns. This included measurements of elevation, slope, and the distribution of different rock types, providing insights into the physical characteristics of the park and its potential for educational activities. Second, field observations yielded quantitative data on specific features of the park, such as the size and accessibility of different areas, presence of water bodies, and condition of existing infrastructure. These data helped to assess the suitability of different locations within the park for educational purposes. Finally, surveys were conducted with the students to gather quantitative data on their learning outcomes and perceptions of the park as a learning resource. This included pre- and post-tests to measure changes in their understanding of geographical concepts and questionnaires to assess their engagement and satisfaction with the learning experience. By combining these diverse quantitative data sources, this study was able to provide a comprehensive and objective assessment of Jasper Stone Park's potential as a learning resource for geography education.

3. Results and Discussion

3.1 Development of Learning Resources

This project aimed to develop pedagogical resources based on the relative area around Jasper Stone Park, and its implementation was multifarious, requiring the participation of teachers, local specialists, and spatial scientists. Their comments were used to construct the content of the educational module. Expert educators pointed out the need to integrate learning materials with the standards of the current curriculum, keeping them as interesting as possible for learners. Teachers also noted the need for the module to include non-passive components that would lead to some thinking and involvement of students. Consequently, the module includes various forms of interactive components such as quizzes, geological models, and virtual field trips. Educators expressed great satisfaction with the module according to the quantitative analysis; 85% of them considered it effective in helping students grasp geographic concepts.

The development of pedagogical resources is a collaborative process involving close interaction between the research team, educators, local specialists, and spatial scientists (Healey, 2003; Nayak, 2024). This collaborative approach ensured that the module's content was not only grounded in research findings, but also aligned with practical teaching experiences and local knowledge. Expert educators played a crucial role in reviewing the module's content, suggesting modifications to ensure alignment with curriculum standards and pedagogical effectiveness. Teachers provided feedback on the module's activities and assessments, suggesting ways to enhance students' engagement and learning. Local specialists, such as park rangers and cultural heritage experts, contribute their expertise to ensure the accuracy and cultural sensitivity of the module's content (Preston, 2015; Zhang et al., 2024). This iterative feedback and refinement process ensured that the final module was a comprehensive and effective learning resource that incorporated diverse perspectives and addressed the needs of both students and educators. Table 2 describes the results of Feedback from Educators and Experts on the utilization of local potential for Jasper Park as a learning resource.

Table 2. Feedback from Educators and Experts

Criteria	Satisfaction Level (% of respondents)
Alignment with Curriculum	92%
Student Engagement	85%
Interactive Components	88%
Relevance of Content	90%

Merging the components of Jasper Stone Park into the learning module was intentional and calculated. We considered the park's geological structures, cultural heritage, and biological variety to be essential components of the learning continuum. For example, the module has an interactive map of Jasper Stone Park, which permits students to observe various geological formations and comprehend their importance in the discipline of geomorphology as can be seen in Figure 2. This map was generated using GIS tools and functions as a multidimensional instructional device because it allows students to actively participate in learning and makes abstract concepts more concrete. Incorporating local cultural stories aided in geographical region information, as it was integrated with the actual life experiences of the people.

To ensure that the learning module was aligned with educational standards and effectively fostered student learning, the integration of Jasper Stone Park's components was guided by the national geography curriculum and the established pedagogical principles. The curriculum provides a framework for identifying relevant geographical concepts and learning objectives, while pedagogical principles such as active learning and inquiry-based learning inform the design of interactive activities and assessments (Kriewaldt et al., 2024; Lee et al., 2022). For instance, the interactive map of Jasper Stone Park was designed to address specific curriculum objectives related to geomorphology and spatial analysis while also encouraging student exploration and discovery. By grounding the module in both curriculum guidelines and pedagogical best practices, we aimed to create a learning experience that was not only engaging, but also academically rigorous and aligned with national educational standards.

The learning module was designed to leverage the diverse learning opportunities offered by the Jasper Stone Park. The geological structures of the park, such as the exposed rock strata and unique landforms, were incorporated into lessons on geomorphological processes, plate tectonics, and rock and mineral formation. Students were able to observe these features firsthand during field trips and analyze them using interactive maps and 3D models within the module. The park's cultural heritage, including indigenous history and traditional land use practices, was integrated into lessons on human-environment interaction, cultural

landscapes, and the impact of human activities on the environment. Students engaged with local narratives, historical accounts, and archaeological data to understand the complex relationship between humans and their environments over time. The park's biodiversity was also incorporated into the module with lessons on ecological concepts, species adaptation, and conservation. Students participated in field surveys, identified local flora and fauna, and analyzed data on ecosystem health and biodiversity. By integrating these diverse components of Jasper Stone Park into the learning module, we aimed to provide students with a holistic and engaging learning experience that fostered their understanding of geographical concepts and appreciation for the interconnectedness of natural and cultural systems (Fadjarajani et al., 2019; Johnston & Mason, 2020; Youdelis et al., 2020).

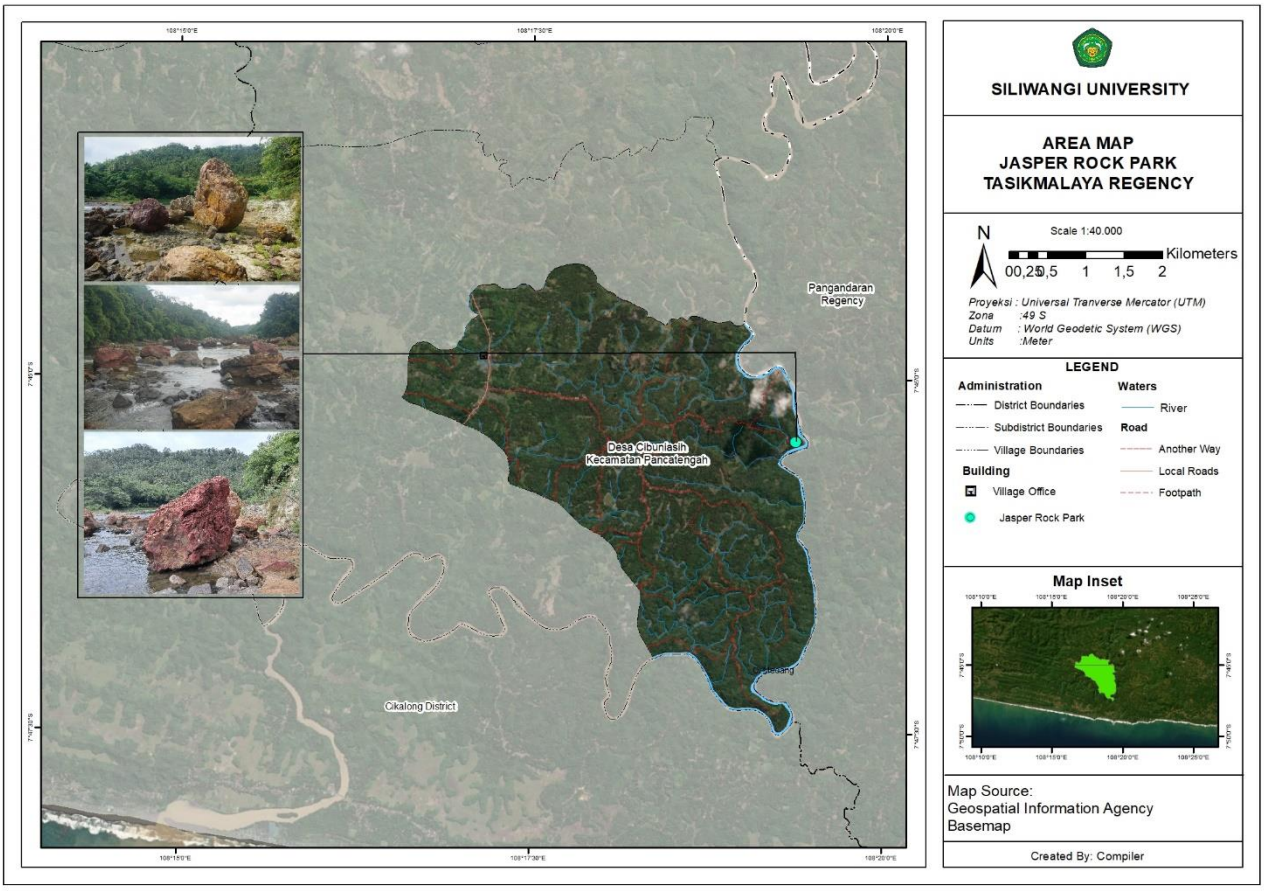

Figure 2. Map of Jasper Stone Park

The development team faced problems in their project despite having made progress towards achieving the goals set by the organization. The major problem was the lack of available satellite imagery of certain Jasper Stone Park regions. The coverage assessment for GIS mapping processes is limited by these factors. The team had to rely on the use of low-quality images, which further deteriorated the spatial information quality. In addition, implementing local culture into the module required professional input from community members in the area to ensure that the content was appropriately blended into local customs. Although this step took a lot of time, it was crucial to ensure that the prepared resources were suitable for a blend of educational and cultural purposes.

Automatic efforts carried out under the project for the Jasper Stone Park learning module serve as an example of employing local materials for geography instruction. The incorporation of ethnocultural maps, illustrations, and stories offered the students the opportunity to participate in both activity and passivity simultaneously. The problems encountered during the work proved the importance of engaging specialists in education, geography, and the community in producing materials (Gong et al., 2021; Miao et al., 2022). A complete learning module that contained all relevant aspects of the curriculum and enabled learners to better understand their environment was the final product of the project (Kurniawan et al., 2023; Thenga et al., 2020).

3.2 Analysis of the Expected Impact on Student Learning

The Jasper Stone Park area is multifunctional and has an interesting mix of geographical features, culture, and nature, which can profoundly enhance the outcomes of students' learning in geography education. With

these features, we hope that the educational module can assist students in accomplishing their key learning outcomes, especially in grasping highly sophisticated geographical concepts and refining their reasonable judgments. The natural features within the Jasper Stone, such as sedimentary rock cliffs, peculiar mineral erosion, and other forms of erosion, are clear illustrations of the phenomena covered in geography lessons. In addition, the cultural value of parks based on traditional and historic local narratives offers additional support for students to relate geography to real-life situations. The school curriculum contextualizes this model with a constructivist approach by showing how contextualization can improve students' learning and participation of students (Dastanpour et al., 2017; Onzi et al., 2023).

Table 3 provides a content analysis of the features of Jasper Stone Park and the expected learning-goal outcomes of the module for students. The table shows the particular geographical features and phenomena of the park and the cognitive skills that students are expected to develop.

Table 3. Content Analysis of Jasper Stone Park and Expected Learning Outcomes

Jasper Stone Park Feature	Geographical Concept	Expected Learning Outcome	Cognitive Skill Development
Sedimentary Rock Layers	Stratigraphy, Sedimentation	Students will understand the process of sedimentation and rock layer formation.	Analytical Skills in Identifying Geological Processes
Erosion Patterns	Erosion and Weathering	Students will be able to explain the impact of erosion on landscape formation.	Critical Thinking in Environmental Change Analysis
Mineral Deposits	Mineralogy, Resource Distribution	Students will learn about the types of minerals and their economic importance.	Application of Knowledge to Real-World Economic Scenarios
Local Cultural Narratives	Human-Environment Interaction	Students will explore the relationship between local culture and the physical environment.	Enhanced Understanding of Cultural Geography
River Systems in Cimedang Basin	Hydrology, Watershed Management	Students will understand river dynamics and the importance of watershed management.	Problem-Solving in Water Resource Management

This analysis details how the multifunctional Jasper Stone Park can be used to accomplish multiple objectives in geography. Students are expected to merge their knowledge with existing natural and cultural features to understand geographical issues and improve their critical thinking skills in relation to the environment and human activities.

The advantage of Jasper Stone Park as a learning resource is the transformation of the abstract concepts of geography into tangible reality. For instance, students who can see sedimentary layers or physical erosion are more likely to know the processes that have progressed to these formations over time. This type of learning is referred to as "hands-on" learning, which is aligned with constructivist learning approaches where the learner is actively involved in the learning process and is able to build new ideas through the experience with the environment (Ahmedi et al., 2023; Ngah et al., 2019). The inclusion of ethnographic materials also enhances learning by linking physical geography with sociocultural elements and vice versa in order to achieve a comprehensive understanding of the subject.

The newly developed learning materials for Jasper Stone Park highlight a clear break from the conventional geography teaching practices. Critics have criticized traditional approaches for their inability to engage students and foster critical thinking since they are mostly textbook-centered and focused on rote learning (Deslauriers et al., 2019). On the other hand, the module on Jasper Stone Park attempts to make full use of the local potential in the area, so that the learning experience can be more authentic and relevant simultaneously. GIS-based maps, for example, are interactive and allow students to retrieve and analyze geographical information in real time, which helps them better understand abstract geographical concepts. Nonetheless, although this new module has been proven to facilitate student engagement and understanding, it also presents some challenges. The dependence of this approach on digital equipment and data quality poses difficulties in regions with poor technological infrastructure. Furthermore, the effectiveness of the module is correlated with teachers' ability to effectively utilize instruction tools provided effectively (Chang, 2023).

The findings of this research carry a unique weight in educational geography and in its effective curriculum construction and implementation. The integration of the local unit, in this instance Jasper Stone Park, illustrates the ethnocentric and intellective types of curriculum design. Local geographical features can be incorporated into the curriculum to motivate students, for which teachers have to design lessons that go beyond the

conventional approach (Martin & Ritchie, 2020). This is also in support of the international inclination towards greater emphasis on education for and about places, as well as the ability to think critically, solve problems, and other 21st century skills (Kurniawan et al., 2023). Thus, the results of this study can facilitate decision making concerning curriculum geography and the particular parts of strategic educational plans needed to improve the educational practices and policies of the region.

It does not revolve solely around Jasper Stone Park, similar to many other issues discussed in this paper, as it has scope for extension in other areas and in different educational contexts. Other elements of the sociocultural profile of a region could be derived in the same manner as in other areas that have successfully performed undertakings in other studies. For instance, coastal school institutions may develop instructional modules for teaching erosion, marine biology, and commercial fishing in coastal classrooms, just as urban institutions may deal with the effects and challenges of urbanization and city building (Kantamaneni et al., 2017; Karkani et al., 2023). This illustrates that geography teachers from whichever part of the globe can adopt these methods towards geography teaching to make learners more interested and raise the level of teaching in a wide range of settings.

4. Conclusion

This study aims to address the research problem of how to effectively utilize Jasper Stone Park's local potential to enhance geography education. By developing and implementing a learning module that integrates a park's geological structures, cultural heritage, and biological variety, we observed significant educational benefits, particularly in terms of increased student engagement and critical thinking. The findings from both the qualitative and quantitative phases of the research explain these positive outcomes. The qualitative data revealed that incorporating local knowledge and perspectives as well as aligning the module with curriculum standards enhanced the relevance and meaningfulness of the learning experience for students. Quantitative data demonstrated that the use of interactive maps, GIS-based activities, and field-based investigations enabled students to actively explore geographical concepts, apply critical thinking skills, and connect abstract ideas to real-world observations. The success of this approach can be attributed to the module's alignment with constructivist learning theories that emphasize active learning, inquiry-based approaches, and the importance of connecting learning to students' lived experiences. By grounding the learning experience in the local context of Jasper Stone Park, the module fostered a deeper understanding of geographical concepts, promoted appreciation of the local environment, and empowered students to become active learners and critical thinkers.

The conclusions of this study support the idea that incorporating specific local geographical and cultural elements into educational materials is crucial for enhancing its importance and effectiveness in geography teaching. This approach also accommodates modern educational requirements of teaching with context in mind and provides a less rigid approach that can be used in any educational setting. The great success of this initiative demonstrates the necessity of geography curricula for students that are globally informative yet locally relevant to prepare them to tackle the complexities of the world.

This suggests that local materials may be used in other parts of the world to teach innovative geography. Further research should assess the long-term effectiveness of this methodology as well as its applicability to other areas with distinct cultural and geographical contexts, so that geography education can be responsive to local and global dynamics.

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