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Integration of Conservation Area-Based Learning Resources in Geography Learning: A Qualitative Study at Bogor Botanical Gardens

Tini Hermawati[1]. Andriani Marisa Mado[2], Vinsensia Kondo[3]
[1]Geography Teacher, Bina Insani High School Bogor, Jawa Barat, Indonesia
[2]Geography Teacher, Giovanni Catholic Senior High School, Kupang, Indonesia
[3]Geography Education Study Program, Faculty of Teacher Training and Educational Sciences, Widya Mandira Catholic University, Kupang, Indonesia

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ABSTRACT

Purpose of the study: This study aims to examine how conservation area-based learning resources are integrated into geography instruction and to analyze the pedagogical processes underlying contextual and experiential learning practices at Bogor Botanical Gardens within secondary education settings.

Methodology: This study employed a qualitative descriptive case study design conducted at Bina Insani High School Bogor. Data were collected through classroom and field observations, semi-structured interviews, and documentation review. Purposive sampling was applied to select participants. Data were analyzed using inductive narrative analysis involving data reduction, data display, conclusion drawing, and triangulation procedures.

Main Findings: The findings indicate a transformation from textbook-centered instruction toward contextual and inquiry-based learning. Conservation-based field activities enhanced student engagement, conceptual clarity, and environmental awareness. Structured planning, guided observation, reflective discussion, and alignment with curriculum competencies ensured instructional coherence. Effective classroom management and logistical preparation were identified as essential factors in sustaining academic rigor within field-based geography learning.

Novelty/Originality of this study: This study provides a process-oriented qualitative analysis of how conservation environments are systematically embedded within geography pedagogy. It advances existing knowledge by foregrounding instructional planning, implementation, and evaluation mechanisms rather than focusing solely on learning outcomes, thereby offering a structured model for integrating ecological contexts into formal secondary geography education.

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Corresponding Author:
Vinsensia Kondo,
Geography Education Study Program, Faculty of Teacher Training and Educational Sciences, Widya Mandira Catholic University,
Jl. San Juan, Penfui Timur, Kecamatan Kupang Tengah, Kabupaten Kupang, Nusa Tenggara Timur 85361, Indonesia
Email: vinsensiakondo72@gmail.com

1. INTRODUCTION

Geography education emphasizes the development of spatial thinking, environmental awareness, and contextual understanding of natural and social phenomena. Contemporary educational paradigms encourage

instructional practices that connect theoretical knowledge with authentic environments [1]-[3]. In this context, conservation areas provide opportunities to bridge classroom concepts with real-world ecological systems. As one of Indonesia's prominent botanical conservation institutions, Bogor Botanical Gardens offers diverse ecological landscapes relevant to geographic inquiry [4]-[6]. Integrating conservation environments into geography education therefore represents a promising approach to strengthening experiential and student-centered learning.

Despite these opportunities, geography instruction in secondary schools often remains predominantly classroom-based and text-oriented. Learning activities frequently rely on lectures and textbooks, limiting students' opportunities to engage directly with environmental observation [7]-[9]. Consequently, students may have fewer opportunities to develop inquiry skills, critical reflection, and higher-order thinking. Such instructional practices can lead students to perceive geography as an abstract and theoretical subject rather than a discipline concerned with dynamic interactions between humans and their environments [10]-[12]. These challenges highlight the need to strengthen the connection between geographical concepts and authentic environmental experiences.

Previous studies have highlighted the educational value of outdoor learning and environmental resources in improving student engagement and conceptual understanding. Botanical gardens and conservation areas have also been recognized as valuable educational settings, particularly in environmental and science education [13]-[15] Experiential learning in authentic environments can encourage students to observe, interpret, and understand geographical phenomena through direct engagement with their surroundings [16]-[18]. Furthermore, the integration of environmental contexts into formal education aligns with student-centered and competency-based learning approaches. These findings provide a foundation for examining conservation areas as potential learning resources in secondary geography education.

One potential solution is to integrate Bogor Botanical Gardens systematically into geography learning through instructional planning, field-based learning activities, and reflective evaluation. This approach positions the botanical garden not merely as a destination for educational visits but as a learning environment connected to curriculum objectives and geographical competencies. Teachers can use the garden's ecological diversity to facilitate contextual observation and the interpretation of environmental phenomena. A qualitative approach can help explore how teachers organize learning activities, connect field experiences with classroom instruction, and evaluate the educational value of conservation-based learning [19]-[21]. Through this approach, the integration of conservation environments can be examined as a structured pedagogical process rather than simply an outdoor learning activity.

Nevertheless, existing research leaves important questions regarding the pedagogical integration of conservation environments into geography education. Although previous studies have examined the benefits of outdoor learning and conservation areas, many primarily emphasize measurable learning outcomes or general educational benefits [22]-[24]. This orientation aligns with contemporary educational shifts toward student-centered and competency-based learning. Furthermore, integrating conservation areas into formal instruction supports sustainable education principles and contextual relevance [25], [26]. Meaningful engagement with environmental settings can thus enrich both cognitive and affective learning dimensions.

The novelty of this study lies in its process-oriented examination of the integration of Bogor Botanical Gardens into secondary geography education. Rather than focusing primarily on learning outcomes or the general benefits of outdoor education, this study examines the relationships among instructional planning, field-based learning activities, curriculum alignment, and reflective evaluation. By analyzing these interconnected dimensions, the study positions a botanical conservation area as a systematically integrated educational resource rather than merely a supplementary field-trip destination. This perspective provides an opportunity to understand the pedagogical processes that connect authentic conservation environments with formal geography instruction. Accordingly, the study extends existing discussions by emphasizing instructional coherence and the systematic use of conservation environments in contextual geography learning.

Investigating conservation-based geography learning is important for strengthening the relevance of geography education and supporting the development of environmentally aware and spatially literate learners. Understanding the pedagogical processes involved can provide insights into how authentic environmental settings are connected with curriculum objectives and meaningful learning experiences. The findings may also inform teachers and educational stakeholders in designing more contextual, experiential, and environmentally oriented geography instruction. Accordingly, this study aims to explore how Bogor Botanical Gardens is integrated into secondary geography learning, focusing on instructional planning, implementation, and evaluation. Through this investigation, the study seeks to provide conceptual and practical insights into the development of conservation-based geography education.

2. RESEARCH METHOD

2.1. Research Site and Time

This study was conducted at Bina Insani High School Bogor, a private secondary school implementing geography instruction at the senior high school level. The learning activities observed were connected to field-based learning conducted at Bogor Botanical Gardens as a conservation-based learning environment. The research focused on Grade X social science students who participated in geography learning activities integrating conservation area resources. Data collection was carried out during the academic period of April 2026. The selected site was considered relevant due to its proximity to the conservation area and its implementation of contextual geography learning practices.

2.2. Research Design

This research employed a qualitative approach with a descriptive case study design to explore the integration of conservation area-based learning resources in geography instruction. A qualitative framework was selected to enable in-depth understanding of instructional processes, teacher strategies, and student experiences within natural learning settings [27], [28]. The study emphasized holistic exploration rather than statistical measurement of outcomes. The researcher functioned as the primary instrument in collecting and interpreting data. An inductive analytical orientation was applied to construct interpretations grounded in field findings.

2.3. Data Sources and Research Subjects

Data sources in this study consisted of human participants, learning environments, and relevant documents. The primary participants included the geography teacher and selected Grade X social science students involved in the learning process. The learning setting, including classroom activities and field-based sessions at the conservation site, constituted contextual data sources. Supporting documents such as school profiles, instructional plans, and learning materials were also examined. The selection of participants was conducted purposively to obtain rich and relevant information regarding instructional integration practices.

2.4. Data Collection Techniques

Data were collected through observation, semi-structured interviews, and documentation review. Observations were conducted to examine instructional activities, student engagement, and the implementation of conservation-based learning in both classroom and field contexts. Semi-structured interviews were carried out with the geography teacher and selected students to capture perceptions, experiences, and instructional reflections [29], [30]. Documentation analysis included reviewing lesson plans, student assignments, and institutional records to support data triangulation. These multiple techniques enabled comprehensive understanding of the integration process within authentic educational settings.

2.5. Data Analysis Techniques

Data analysis was conducted through iterative stages involving data reduction, data display, and conclusion drawing. Initial analysis began prior to field engagement through preliminary review of relevant contextual information. During the field process, collected data were organized, categorized, and interpreted using narrative descriptive techniques. Patterns and themes related to instructional planning, implementation, and evaluation were systematically identified. The credibility of findings was strengthened through triangulation across observation, interview, and documentation sources to ensure analytical consistency.

3. RESULTS AND DISCUSSION

3.1. Transformation of Learning Orientation: From Text-Based to Contextual Learning

The findings indicate that geography instruction prior to the integration of conservation-based learning resources was predominantly classroom-centered and text-oriented. Teaching activities relied mainly on textbooks, supported occasionally by encyclopedias and internet sources. This instructional pattern positioned students as passive recipients of information, emphasizing note-taking and responding to teacher questions. Such conditions contributed to reduced student engagement and learning motivation. The shift toward utilizing Bogor Botanical Gardens marked a transition from teacher-centered delivery to more contextual and experiential learning practices.

The decision to conduct learning activities in the conservation area emerged from the teacher's intention to address students' boredom and low learning outcomes. The botanical garden was selected due to its ecological diversity and relevance to geography competencies, particularly biosphere and climate-related topics. This shift represented not merely a change of location but a reorientation of instructional design. Learning was

structured to connect theoretical concepts with observable environmental phenomena. As a result, geography instruction began to reflect a more student-centered and inquiry-based approach.

3.2. Instructional Integration in Field-Based Learning Activities

The integration process was implemented through two structured field learning sessions. During the first session, students explored various types of natural vegetation within the conservation area and documented their observations in groups. The teacher facilitated pre-activity briefings, clarified learning objectives, and provided guiding questions to scaffold inquiry. Students conducted identification, classification, and analytical discussion of vegetation types found in the field. These activities enabled direct engagement with biosphere concepts that had previously been studied only through textbooks.

In the second session, the learning focus expanded to global warming phenomena, particularly El Niño and La Niña, and their environmental implications. Students were guided to observe environmental indicators and relate them to broader climatic processes. Group-based analysis and reporting were conducted to encourage collaborative interpretation of findings. The teacher maintained instructional structure by managing time allocation and ensuring alignment with lesson objectives. This systematic organization demonstrated that the conservation area functioned as an integrated learning resource rather than as a recreational excursion.

3.3. Student Engagement and Experiential Meaning-Making

Observational and interview data reveal increased student enthusiasm and active participation during field-based learning sessions. Students expressed that learning in an open and authentic environment reduced boredom and enhanced conceptual clarity. Direct observation allowed them to connect abstract geographic theories with tangible environmental realities. The experiential dimension of learning fostered curiosity, discussion, and collaborative problem-solving among group members. This shift suggests that conservation-based learning environments can strengthen both cognitive understanding and affective engagement.

Furthermore, students reported that seeing geographic phenomena firsthand improved their retention and comprehension of material. The integration of theory and practice enabled them to internalize concepts related to vegetation distribution and climate variability more effectively. Learning activities encouraged analytical thinking through identification, comparison, and interpretation tasks. The field context also cultivated a sense of environmental awareness and appreciation. These findings indicate that experiential exposure contributed to deeper and more meaningful learning processes.

3.4. Pedagogical Management and Implementation Challenges

Despite the positive outcomes, several practical challenges emerged during implementation. Distance from the school to the conservation site required careful logistical planning and time management. Weather conditions, particularly heat and potential rainfall, occasionally influenced learning comfort and activity flow. Initial student behavior in open environments required structured supervision and clear instructional guidelines. The teacher addressed these challenges through explicit rule-setting, time scheduling, and consistent facilitation.

Effective integration was supported by deliberate planning, including the formulation of objectives, grouping strategies, and reflective discussions. The teacher emphasized alignment between field activities and curriculum indicators to maintain academic rigor. Structured questioning and post-activity reflection sessions reinforced conceptual consolidation. These strategies ensured that the conservation area was utilized systematically within formal instructional frameworks. Overall, the findings demonstrate that successful integration depends not only on environmental potential but also on pedagogical design and classroom management competence.

The integration of conservation-based learning resources reoriented geography instruction from a predominantly text-driven approach toward contextual and experiential engagement. Prior classroom practices emphasized content transmission through textbooks and teacher explanation, which limited opportunities for direct environmental interaction. The incorporation of field activities at Bogor Botanical Gardens introduced authentic ecological contexts into formal instruction. Through structured observation and guided inquiry, students engaged with geographic phenomena as lived realities rather than abstract representations. This transformation reflects a pedagogical shift toward learning processes that prioritize experiential meaning-making and environmental interpretation.

Instructional coherence emerged as a central factor in ensuring that field-based activities maintained academic rigor. The teacher's planning aligned conservation site exploration with biosphere and climate-related competencies embedded in the curriculum. Pre-field briefings, analytical worksheets, and reflective discussions functioned as scaffolding mechanisms connecting theoretical constructs with empirical observation. Such alignment prevented the learning experience from becoming recreational and instead sustained its disciplinary focus. The structured integration illustrates how contextual environments can be systematically embedded within geography pedagogy.

These patterns correspond with constructivist perspectives that position knowledge as actively constructed through interaction with meaningful contexts. Outdoor and environmental learning literature has long emphasized the motivational and cognitive benefits of authentic settings [31], [32]. Nevertheless, scholarly discussions often privilege outcome measurement while providing limited attention to instructional orchestration within subject-specific domains [30], [33]. By examining planning strategies, facilitation techniques, and reflective consolidation, this study contributes a process-oriented account of how environmental resources are pedagogically operationalized. This analytical emphasis strengthens understanding of the mechanisms through which contextual learning enhances conceptual depth.

The articulation of conservation areas as embedded instructional spaces advances current discourse in geography education. Rather than functioning as peripheral enrichment activities, ecological environments are positioned as integral components of curriculum implementation [34], [35] This framing underscores the importance of aligning spatial competencies, environmental literacy, and inquiry-based practices within a coherent instructional design. The qualitative insights demonstrate how disciplinary objectives can be translated into structured field experiences without diluting academic standards [36]. Such positioning refines existing interpretations of experiential learning within secondary geography contexts.

From a pedagogical standpoint, the findings highlight the necessity of deliberate instructional mediation when utilizing external learning environments. Effective field-based geography learning requires clear objectives, guided observation tasks, and systematic reflection to consolidate understanding [37], [38]. Institutional support and collaborative engagement with conservation institutions may further strengthen the sustainability of such practices. Integrating ecological contexts into formal education contributes to the cultivation of spatial reasoning, critical inquiry, and environmental responsibility. These dimensions collectively reinforce the relevance of geography as a discipline grounded in real-world phenomena.

Several constraints should be acknowledged in interpreting these findings. The study was situated within a single institutional context and involved a specific cohort of students, which may limit transferability to other educational environments [39], [40]. The qualitative design privileges interpretative depth and does not provide quantitative measures of academic achievement. Temporal limitations also restricted observation to a defined implementation period rather than long-term instructional cycle s. Subsequent investigations may adopt longitudinal or comparative approaches to examine sustained pedagogical impact across diverse settings.

4. CONCLUSION

This study demonstrates that the integration of conservation area-based learning resources into geography instruction enables a substantive transformation from text-oriented pedagogy toward contextual and experiential engagement. Through structured planning, guided inquiry, and reflective consolidation, field-based learning at Bogor Botanical Gardens functioned as an embedded instructional resource aligned with curriculum competencies rather than as a supplementary excursion. The findings indicate that such integration enhances student participation, conceptual clarity, and environmental awareness by connecting theoretical constructs with observable geographic phenomena. Pedagogical coherence, classroom management strategies, and alignment between field activities and learning objectives emerged as critical determinants of instructional effectiveness. These results correspond with the study's initial premise that authentic environmental contexts can strengthen spatial thinking and meaningful learning processes within secondary geography education. Prospectively, broader implementation across diverse institutional settings and longitudinal inquiry into sustained academic and affective impacts may further advance the development of conservation-integrated geography pedagogy.

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