

## Exploring Holistic Learning through Deep Learning Pedagogy in Geography Education

Albertus Erico Jerry Krisna Nugroho<sup>ID</sup>, Sugiyanto\*<sup>ID</sup>, Singgih Prihadi<sup>ID</sup>

Department of Geography Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Indonesia

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#### Corresponding Author

E-mail:

[sugiyanto60@staff.uns.ac.id](mailto:sugiyanto60@staff.uns.ac.id)

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### ABSTRACT

The implementation of Indonesia's Deep Learning Pedagogy has attracted increasing attention as a learner-centred approach that promotes joyful, mindful, and meaningful learning. However, empirical evidence explaining how this pedagogical approach facilitates holistic learning in secondary geography education remains limited. This study explores how Indonesia's Deep Learning Pedagogy is implemented to foster holistic learning in geography classrooms. An exploratory qualitative design was employed involving nine public senior high schools in Surakarta, Indonesia. Data were collected through semi-structured interviews with geography teachers and vice principals, classroom observations, student interviews, and document analysis. The data were analysed using thematic analysis based on four predefined dimensions of holistic learning: Intellectual Development, Character and Moral Development, Social and Emotional Development, and Physical and Active Engagement. The findings indicate that the four dimensions were consistently manifested through inquiry-based, contextual, collaborative, reflective, and experiential geography learning practices. Although implementation varied according to school contexts and learning opportunities, all schools demonstrated the integration of holistic learning within everyday instructional practices. The findings further show that these dimensions function as interconnected manifestations of meaningful geography learning rather than as separate educational outcomes. This study proposes a Holistic Geography Learning Model that clarifies the conceptual relationship between Indonesia's Deep Learning Pedagogy, geography learning practices, and holistic student development. The model contributes a subject-specific framework for implementing holistic learning and offers practical implications for geography education and future curriculum development.

### INTRODUCTION

Globalization and rapid digital transformation have increased the complexity of social, economic, and environmental challenges, fundamentally reshaping the educational landscape. Contemporary education is expected not only to promote the acquisition of knowledge but also to develop competencies required to thrive in an increasingly dynamic and uncertain world (Syafi'i et al., 2024). Consequently, 21st-century education emphasizes critical thinking, creativity,

communication, collaboration, digital literacy, and problem-solving as essential competencies for learners (González-Pérez & Ramírez-Montoya, 2022; Zou et al., 2025). To achieve these outcomes, learning should provide meaningful experiences that support both academic achievement and students' overall development (Ariyanti et al., 2025; Martinez, 2022).

In response to these educational demands, holistic learning has emerged as a learner-centered approach that promotes the integrated development of intellectual,

emotional, social, moral, and spiritual dimensions (Chiu, 2021; Fatimah & Sumarni, 2024). Rather than emphasizing cognitive achievement alone, holistic learning also fosters character development, self-awareness, and meaningful relationships with others and the environment (Koul & Nayar, 2021). A systematic review by Miseliunaite et al. (2022), demonstrated that holistic education enhances higher-order thinking, social awareness, environmental responsibility, and learners' readiness to address global challenges, making it particularly relevant to Education 4.0.

This perspective is highly relevant to geography education because the discipline integrates spatial, environmental, and societal perspectives. Beyond developing spatial knowledge, geography learning cultivates systems thinking, decision-making, environmental awareness, and social responsibility by exploring contemporary issues such as climate change, disasters, urbanization, and sustainable development. Sugiyanto et al. (2018), found that geography education strengthens geographic literacy and critical thinking, while subsequent research highlighted its contribution to creativity, communication, collaboration, and problem-solving skills (Sugiyanto et al., 2023). Accordingly, geography education requires pedagogical approaches that combine conceptual understanding with authentic and meaningful learning experiences (McPhee, 2022).

In line with efforts to improve educational quality, Indonesia has introduced Deep Learning pedagogy as part of the Merdeka Curriculum. In this context, Deep Learning refers to a pedagogical approach that emphasizes conceptual understanding, reflection, active engagement, and the application of knowledge to authentic situations (Prihantoro et al., 2025). This approach supports more meaningful, contextual, and learner-centered learning (Ambarita et al., 2025). A Systematic review by Nurhasanah et al. (2025), further suggested that Deep Learning bridges the development of 21st-

aligning with 21st-century competencies and Indonesia's curriculum reform agenda. The pedagogy reported its positive contribution to students' critical thinking and scientific skills (Taufik et al., 2025).

Indonesia's Deep Learning Pedagogy is built upon three interconnected principles: joyful learning, mindful learning, and meaningful learning (Alim et al., 2025). These principles closely align with the concept of holistic learning by promoting emotional engagement, reflective thinking, and authentic learning experiences. According to Handayani et al. (2026), these principles contribute to the development of well-rounded graduates by supporting four interconnected dimensions of holistic learning: intellectual development, character and moral development, social and emotional development, and physical and active engagement (Yulianti, 2024). Together, these dimensions provide a conceptual foundation for understanding holistic student development within geography education. The relevance of Indonesia's Deep Learning Pedagogy becomes increasingly significant in geography education, particularly for Generation Z learners who are immersed in digital environments. Geography learning requires pedagogical approaches that encourage active participation, critical reflection, exploration of real-world issues, and meaningful learning experiences (Kapisan et al., 2026). Through these characteristics, Deep Learning Pedagogy has the potential to strengthen students' ability to understand and address complex spatial and environmental problems.

Surakarta City, Central Java Province, provides a relevant context for examining this implementation because it is recognized as one of Indonesia's educational centers with an established secondary education system (Setyono & Cahyono, 2019). Previous studies have shown that schools in Surakarta actively promote instructional innovations to strengthen 21st-century competencies (Ni'matussyahara et al., 2023; Safitri, 2022; Sugiyanto et al., 2018; Sugiyanto et al., 2026). Moreover, Tjahjono et al. (2026) reported that geography teachers

in Surakarta possess a relatively good understanding of Deep Learning within the Merdeka Curriculum. Nevertheless, the study focused primarily on teachers' understanding rather than examining how Deep Learning Pedagogy is enacted in classroom practice.

Despite growing discussion of Indonesia's Deep Learning Pedagogy and holistic learning, an important empirical gap remains. Existing studies have largely examined Deep Learning Pedagogy in terms of policy implementation, teacher readiness, and conceptual understanding, while limited empirical attention has been given to how its principles are enacted through subject-specific classroom practices (Prihantoro et al., 2025; Waloyo et al., 2026). At the same time, holistic learning is commonly discussed as a broad educational orientation, with less attention to how its four dimensions are simultaneously manifested within geography education (Naidoo, 2021; Triana et al., 2025). Recent research has examined the strategic implementation of Indonesia's Deep Learning Pedagogy in high school geography education, including the conditions for its implementation and strategic considerations in the Surakarta context (Nugroho et al., 2026). However, a strategic analysis does not fully explain how the pedagogy is enacted through everyday classroom practices or how its principles are connected to holistic student development. This study addresses this gap by examining how Indonesia's Deep Learning Pedagogy is implemented in secondary geography classrooms to foster intellectual development, character and moral development, social and emotional development, and physical and active engagement.

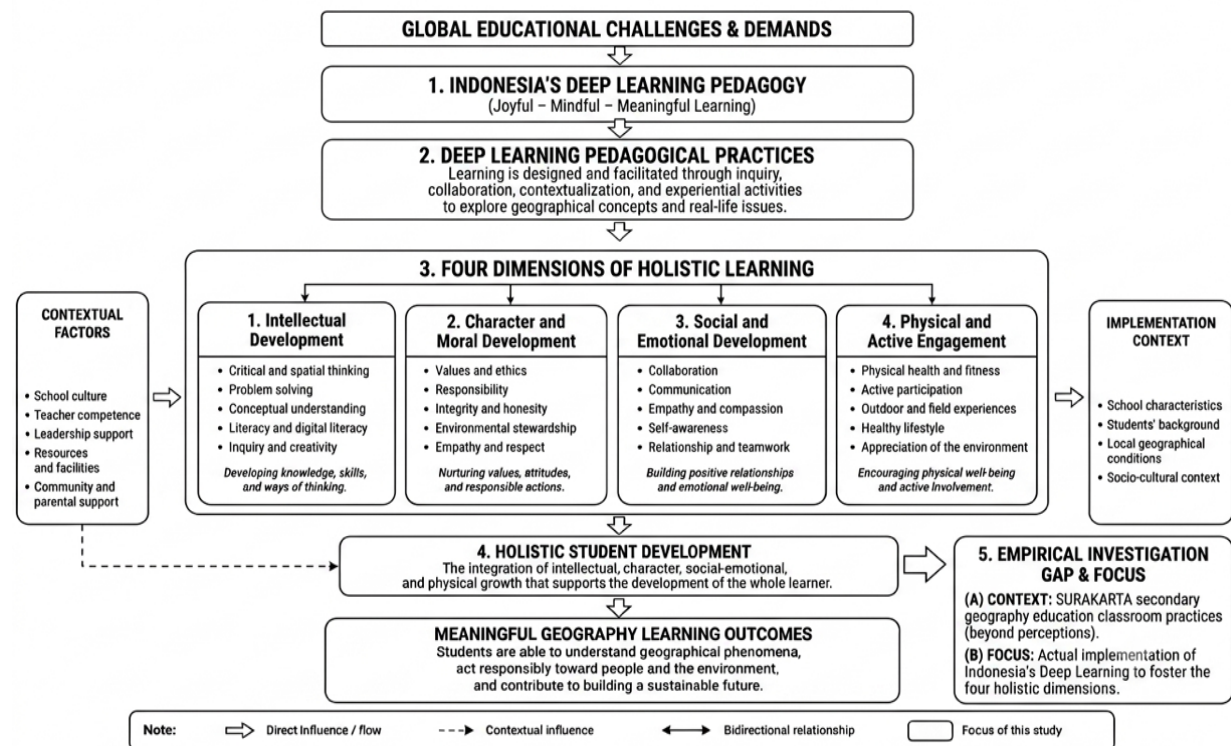
The novelty of this study lies in three related contributions. First, it provides empirical evidence of how Deep Learning Pedagogy is enacted in everyday geography classroom practices across multiple secondary schools. Second, it analytically examines the relationship between the principles of joyful, mindful, and meaningful learning and the four

dimensions of holistic learning within a subject-specific geographical context. Third, based on the empirical findings, the study develops a Holistic Geography Learning Model that extends the existing conceptual framework by explaining how Deep Learning Pedagogy, geography-specific learning practices, and the interconnected dimensions of holistic development are integrated in meaningful geography learning. Thus, rather than merely applying an existing holistic learning framework, this study seeks to provide an empirically grounded interpretation of how holistic learning can be operationalized through geography education.

To address the identified research gap, this study was guided by the following research questions: (1) How is Indonesia's Deep Learning Pedagogy implemented to foster holistic learning in secondary geography education?; (2) How are the four dimensions of holistic learning manifested in geography learning practices?; (3) What similarities and contextual differences characterize the implementation of holistic learning across the participating secondary schools?; and (4) How do teachers and students perceive the implementation of Indonesia's Deep Learning Pedagogy in geography education?

This study adopts Indonesia's Deep Learning Pedagogy as the conceptual foundation for examining the implementation of holistic learning in geography education. Rather than referring to artificial intelligence, Indonesia's Deep Learning Pedagogy is understood as a learner-centered pedagogical approach that promotes joyful, mindful, and meaningful learning. Within this conceptual foundation, the four dimensions of holistic learning intellectual development, character and moral development, social and emotional development, and physical and active engagement are treated as interconnected dimensions through which holistic learning may be manifested in geography classrooms. The framework therefore served as an a priori analytical lens for formulating the research questions, guiding data collection, and informing the initial

deductive coding and interpretation of the empirical evidence.



**Figure 1.** Conceptual Framework of Holistic Learning Implementation through Indonesia's Deep Learning Pedagogy (Source: Developed by Researchers, 2026)

As illustrated in **Figure 1**, the conceptual framework links Indonesia's Deep Learning Pedagogy with geography learning practices and the four dimensions of holistic learning. It does not prescribe a sequential or causal relationship among these elements. Instead, it provides an analytical starting point for examining how the pedagogical principles are manifested through geography learning practices and how these practices relate to the interconnected dimensions of holistic learning across different school contexts.

## RESEARCH METHODS

### Research Design

This study employed a qualitative exploratory design to examine how Indonesia's Deep Learning Pedagogy is implemented to foster the four dimensions of holistic learning in secondary geography education. A qualitative approach was considered appropriate because it enables an in-depth understanding of participants'

experiences, meanings, and instructional practices within their natural educational contexts (Gerring, 2017). It also facilitates the interpretation of social processes and interactions underlying educational practice (Busetto et al., 2020; Lichtman, 2023).

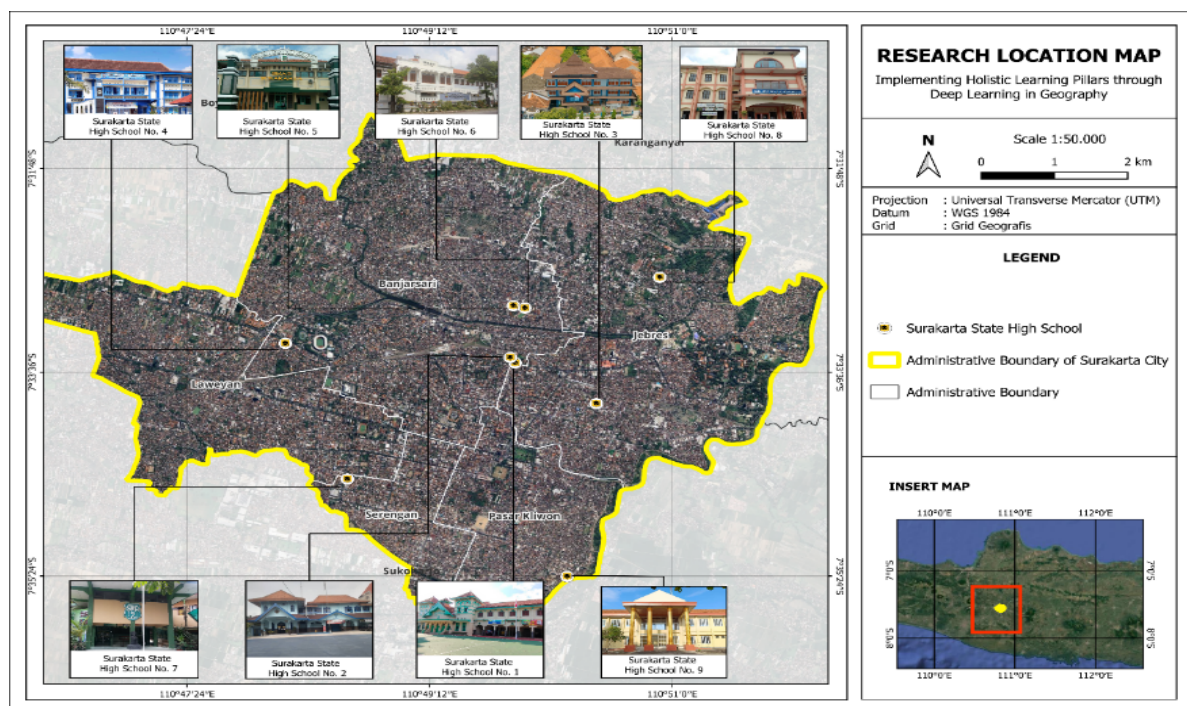
An exploratory design was adopted because the implementation of Indonesia's Deep Learning Pedagogy in geography education remains underexplored and requires further empirical investigation (Lim, 2025). Exploratory qualitative research is particularly appropriate for examining emerging educational practices and developing a comprehensive understanding of participants' experiences (Tisdell et al., 2025), accordingly, this study explored how geography teachers implemented learning practices that foster the four dimensions of holistic learning within Indonesia's Deep Learning Pedagogy (Mu'ti et al., 2025). Data were collected from nine public senior high schools in Surakarta to capture contextual variation in the implementation of holistic

learning. For analytical purposes, each participating school was treated as a contextual case, enabling the researchers to examine how Indonesia's Deep Learning Pedagogy was manifested within each school context. The analysis subsequently employed cross-case analysis to identify recurring patterns, similarities, and contextual differences across the nine participating schools. This approach enabled the study to examine both common patterns and contextual variations in the implementation of holistic learning without treating the participating schools as statistically independent units.

### Research Setting and Subject

The study was conducted in nine public senior high schools in Surakarta, Central Java (**Figure 2**). Surakarta was selected because it is recognized as one of Central Java's educational centers,

characterized by relatively equitable access to secondary education and continuous instructional innovation (Setyono & Cahyono, 2019). Previous studies have also reported that geography education in Surakarta actively promotes the development of 21st-century competencies (Abdullah & Maryani, 2024; Sugiyanto et al., 2023). Furthermore, geography teachers in the city have demonstrated a relatively good understanding of Indonesia's Deep Learning Pedagogy within the Merdeka Curriculum (Tjahjono et al., 2026). Strategies for implementing learning in Surakarta have also been identified by previous research (Nugroho et al., 2026). This has led researchers to focus more on the principles of classroom learning under study. However, empirical evidence regarding its implementation to foster holistic learning in geography classrooms remains limited.



**Figure 2.** Location of the Participating Schools (Source: Developed by Researchers, 2026)

The study involved geography teachers as the primary participants, with support from vice principals for curriculum and students to strengthen data triangulation. Geography teachers were purposively selected because they were directly responsible for planning,

implementing, and evaluating geography instruction (Hazari, 2023). Student participants were recruited from the observed Fase E (Grade X) and Fase F (Grade XI) classes through teacher-assisted purposive sampling to provide perspectives on their classroom learning experiences,

while vice principals contributed institutional perspectives on curriculum implementation (Ahmad & Wilkins, 2025).

Detailed participant characteristics are presented in **Table 1**.

**Table 1.** Characteristics of the Study Participants

| Participant Group              | Number                                                                               | Participant Selection                                                                                                 | Role in the Study                                |
|--------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Geography teachers             | 9 (1 from each school)                                                               | Purposive sampling based on responsibility for teaching geography and implementing Indonesia's Deep Learning Pedagogy | Primary participants                             |
| Vice principals for curriculum | 9 (1 from each school)                                                               | Purposive sampling based on responsibility for curriculum implementation                                              | Institutional perspective and data triangulation |
| Students                       | 10 students per school (maximum 5 students from phase E and 5 students from phase F) | Teacher-assisted purposive sampling from observed classes                                                             | Learner perspective and data triangulation       |

(Source: Developed by Researchers, 2026)

As presented in **Table 1**, the study involved three participant groups: nine geography teachers, nine vice principals for curriculum, and student participants from the observed classes. The geography teachers served as the primary participants because they were directly responsible for implementing Indonesia's Deep Learning Pedagogy in classroom practice. One geography teacher and one vice principal for curriculum were selected from each participating school through purposive sampling. The vice principals were included to provide institutional perspectives on curriculum implementation and support data triangulation. Student participants were selected from the observed Phase E (Grade X) and Phase F (Grade XI) classes through teacher-assisted purposive sampling. Their participation provided additional perspectives that strengthened data triangulation and enriched the understanding of classroom learning experiences.

### Participant Recruitment

Participants were recruited using purposive sampling based on their relevance to the research objectives. Geography teachers were selected because they were directly involved in implementing

Indonesia's Deep Learning Pedagogy in geography classrooms. Vice principals for curriculum were recruited to provide institutional perspectives on curriculum implementation. Student participants were nominated by the participating geography teachers from the observed Phase E (Grade X) and Phase F (Grade XI) classes to ensure they had actively participated in the learning activities and could reflect on their classroom experiences. Data collection continued until sufficient information had been obtained to address the research questions and no substantial new insights emerged from subsequent interviews and observations.

### Researcher Role

The first author served as the primary researcher throughout the study and was responsible for conducting interviews, classroom observations, organizing data, and conducting thematic analysis. During data collection, the researcher adopted a non-participant role to minimize disruption to classroom activities while maintaining consistency in data collection procedures. Reflexive field notes were recorded throughout the study to support data interpretation and enhance analytical rigor.

## Data Collection

Research data were collected through semi-structured interviews, non-participant classroom observations, and student interviews to obtain a comprehensive understanding of the implementation of holistic learning while strengthening the credibility of the findings through methodological and source triangulation (Schlunegger et al., 2024). Data were collected through semi-structured interviews, non-participant classroom observations, and student interviews to obtain a comprehensive understanding of the implementation of holistic learning while strengthening the credibility of the findings through methodological and source triangulation (Mu'ti et al., 2025), while allowing flexibility for participants to elaborate on their experiences (Hamilton & Finley, 2019).

With participants' consent, all interviews were audio-recorded and supplemented with field notes taken during the interviews. The audio recordings were subsequently transcribed verbatim to facilitate data analysis. Classroom observations were conducted in Phase E (Grade X) and Phase F (Grade XI) geography lessons to examine how the four dimensions of holistic learning were manifested in classroom practice (Chand, 2025; Finkelstein et al., 2021). To further strengthen data triangulation, semi-structured interviews were conducted with selected students to explore their learning experiences and confirm findings obtained from teacher interviews and classroom observations. The operational framework for data collection is presented in Table 2.

**Table 2.** Operationalization of the Conceptual Framework

| Holistic Learning Dimension      | Analytical Focus                        | Evidence Collected                           |
|----------------------------------|-----------------------------------------|----------------------------------------------|
| Intellectual Development         | Higher-order thinking and inquiry       | Interviews, observations, learning documents |
| Character and Moral Development  | Values and responsible behaviour        | Interviews, observations, learning documents |
| Social and Emotional Development | Collaboration, empathy, and interaction | Interviews, observations, learning documents |
| Physical and Active Engagement   | Participation and experiential learning | Interviews, observations, learning documents |

(Source: (Mu'ti et al., 2025), with Modification)

## Data Analysis

The qualitative data were analyzed using thematic analysis to identify, organize, and interpret patterns of meaning emerging from teacher interviews, student interviews, classroom observations, and supporting documents. Thematic analysis was selected because it enables researchers to systematically examine participants' experiences, perspectives, and instructional practices while providing flexibility in relating empirical findings to the study's conceptual framework (Ahmed et al., 2025). The analysis followed the iterative thematic analysis framework developed by Braun and Clarke, which has been widely applied in educational research (Kushnir, 2025; Peel, 2020). Following data collection, interview

recordings were transcribed verbatim, observation field notes were compiled, and all supporting documents were organized into a unified dataset. All authors repeatedly reviewed the dataset to become familiar with the data before initiating coding (Lester et al., 2020).

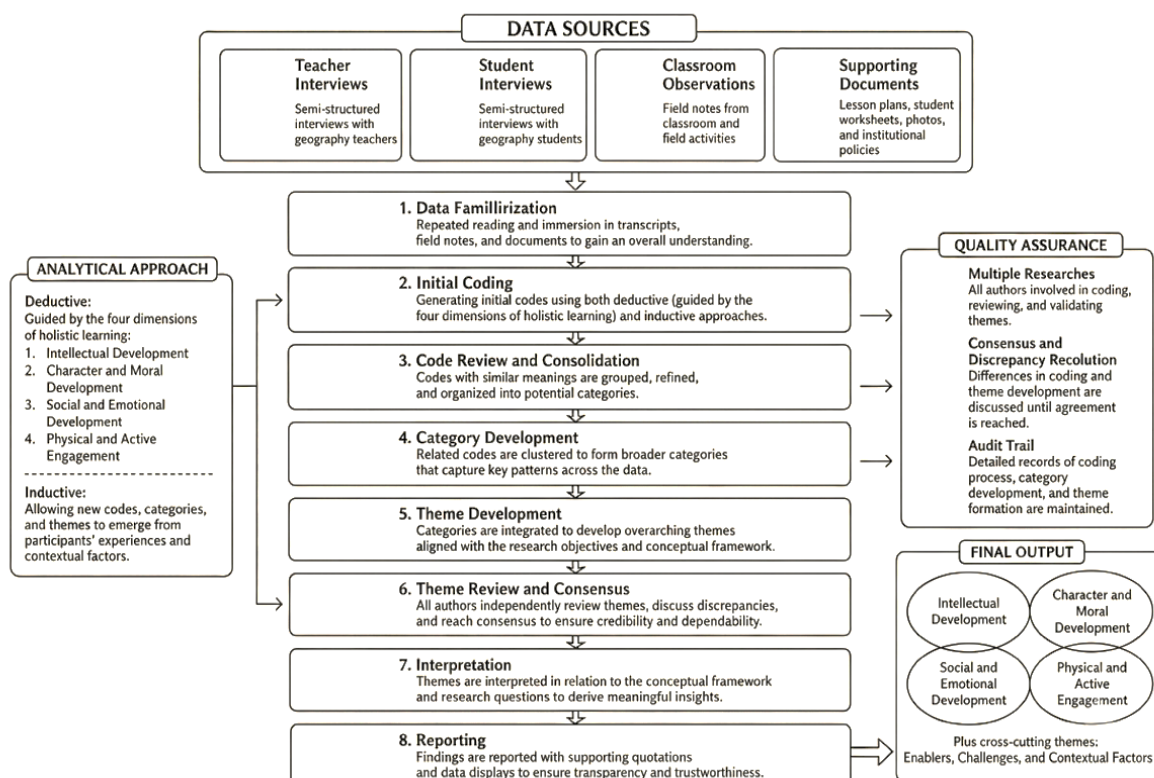
Data coding was conducted manually by all authors using a combination of deductive and inductive approaches (Xu & Zammit, 2020). Deductive coding was guided by the conceptual framework of Indonesia's Deep Learning Pedagogy, focusing on four dimensions of holistic learning: intellectual development, character and moral development, social and emotional development, and physical and active engagement. Simultaneously,

inductive coding enabled additional subthemes to emerge from participants' experiences and classroom practices that were not fully represented by the predefined framework. Coding decisions were independently reviewed by all authors, and any discrepancies were discussed until consensus was achieved.

Following the coding process, the analysis proceeded through two complementary stages. First, a within-school analysis was conducted to examine how Indonesia's Deep Learning Pedagogy and the four dimensions of holistic learning were manifested within each participating school. Relevant codes and themes were organized based on evidence from each school context. Second, a cross-case analysis was conducted to compare findings across the nine participating schools. This comparison focused on identifying recurring patterns, similarities, and contextual differences in the implementation of holistic learning. Patterns consistently observed across schools were interpreted as common features of implementation, whereas divergent findings

were retained as contextual variations rather than excluded from the analysis.

Codes with similar meanings were subsequently grouped into broader categories before being synthesized into overarching themes. Throughout the analytical process, themes were continuously refined by comparing them with the original interview transcripts, observation notes, and supporting documents to ensure analytical consistency and credibility. The cross-case synthesis was conducted alongside this iterative thematic refinement to examine how identified themes were manifested across different school contexts. The overall thematic analysis procedure is illustrated in Figure 3, while representative examples of the coding process are presented in Table 3. Finally, the validated themes were interpreted in relation to the conceptual framework to explain how Indonesia's Deep Learning Pedagogy facilitates the implementation of holistic learning in secondary geography education and to identify contextual factors influencing its implementation across participating schools.



**Figure 3.** Thematic Analysis Procedure (Source: Developed by Researchers, 2026)

**Table 3.** Representative Example of the Thematic Coding Process

| Representative Data Excerpt                                                                                                                                    | Meaning Unit                                                      | Initial Code                                               | Category              | Theme                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------|-----------------------|-----------------------------------------|
| Teacher facilitated students in analysing geographical problems, interpreting spatial information, and proposing solutions to real-world environmental issues. | Students analyse authentic geographical problems.                 | Critical analysis; spatial reasoning; problem solving      | Higher-order thinking | <b>Intellectual Development</b>         |
| Teachers encouraged students to reflect on environmental responsibility, discipline, and ethical decision-making during geography learning.                    | Learning promotes responsible attitudes and environmental ethics. | Environmental responsibility; reflection; values education | Character formation   | <b>Character and Moral Development</b>  |
| Students actively collaborated in group discussions, respected different viewpoints, and communicated their ideas during classroom activities.                 | Collaborative interaction among students.                         | Collaboration; communication; empathy                      | Social interaction    | <b>Social and Emotional Development</b> |
| Geography learning involved field observations, environmental investigations, and active student participation beyond classroom instruction.                   | Students engage directly in experiential learning activities.     | Field investigation; active participation                  | Experiential learning | <b>Physical and Active Engagement</b>   |

(Source: Developed by Researchers, 2026)

### Trustworthiness

The trustworthiness of this study was enhanced through source triangulation, method triangulation, and expert validation. Source triangulation involved comparing information obtained from geography teachers, students, and vice principals for curriculum affairs, while method triangulation integrated evidence from interviews, classroom observations, and supporting documents to strengthen the credibility of the findings (Ahmed, 2024; Morgan, 2024).

Prior to data collection, the interview and observation instruments underwent expert validation to ensure their alignment with the research objectives and the conceptual framework of holistic learning. The expert panel consisted of the Chair of the Surakarta City Principals' Association

(MKKS), the Chair of the Surakarta City Geography Teachers' Working Group (MGMP), a senior high school supervisor, and a university expert in geography education. Their feedback was incorporated to refine the research instruments before field implementation, thereby enhancing the credibility and confirmability of the study (Cloutier & Ravasi, 2021).

### Ethical Considerations

This study received ethical approval from the Health Research Ethics Committee, Universitas Kusuma Husada Surakarta (Ethical Approval No. 3438/UKH.L02/EC/IV/2026). Prior to data collection, written informed consent was obtained from all participating teachers and vice principals. Student participation was voluntary and conducted with permission

from the participating schools and classroom teachers. To ensure confidentiality, all schools and participants were anonymized using identification codes, and all interview recordings, field notes, and transcripts were securely stored and used solely for research purposes. Quotations reported in this study were presented anonymously to protect participants' identities.

## RESULTS AND DISCUSSION

### Cross-Case Overview of Holistic Learning Implementation through Indonesia's Deep Learning Pedagogy

This section presents the findings of the cross-case analysis conducted across the

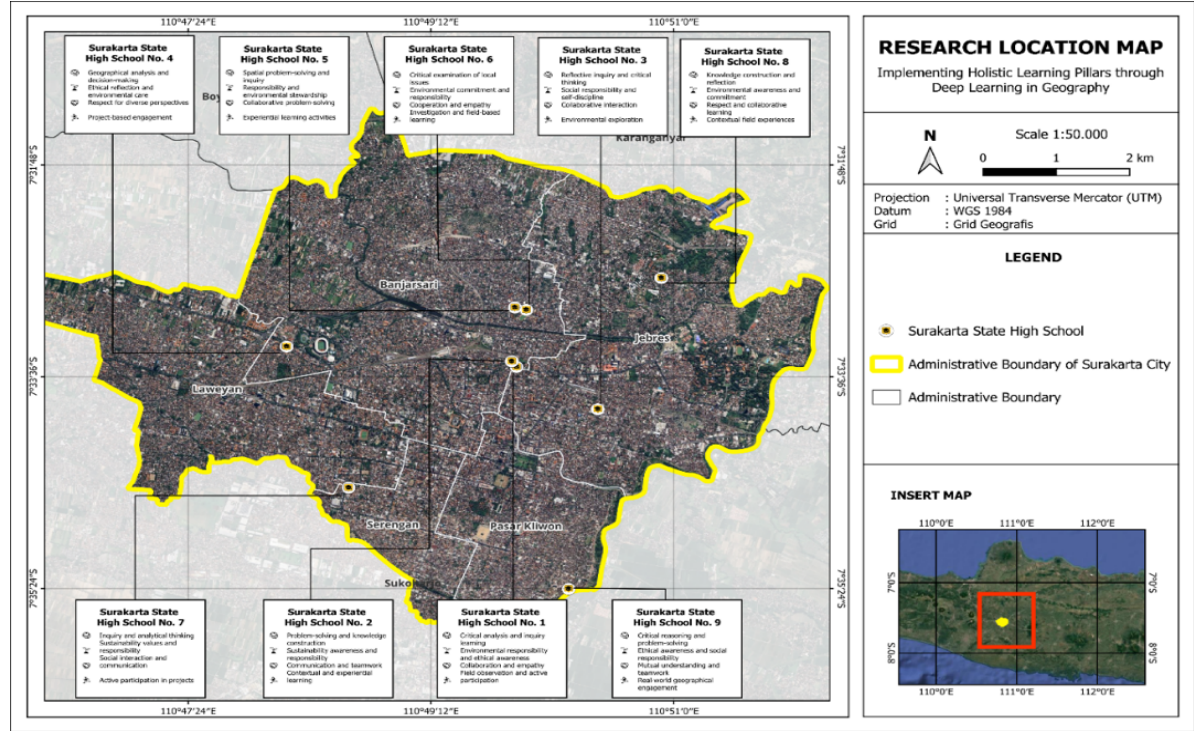
nine participating secondary schools. The analysis focuses on how Indonesia's Deep Learning Pedagogy was implemented to foster holistic learning in geography education. Rather than comparing schools based on performance, the analysis identifies common pedagogical patterns and contextual variations in how the four dimensions of holistic learning manifest (see **Table 4**). The synthesis presented in this matrix was derived from thematic analysis that triangulated teacher interviews, student interviews, classroom observations, and supporting documents. The matrix served as the analytical basis for developing the spatial visualization presented in **Figure 4**.

**Table 4.** Cross-Case Evidence Matrix Supporting the Spatial Mapping

| School                             | Teacher Interview | Student Interview | Classroom Observation | Supporting Documents | Cross-case Synthesis                                                                     |
|------------------------------------|-------------------|-------------------|-----------------------|----------------------|------------------------------------------------------------------------------------------|
| Surakarta Public High School No. 1 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through inquiry-oriented and contextual geography learning    |
| Surakarta Public High School No. 2 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through collaborative and project-based learning              |
| Surakarta Public High School No. 3 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through environmental investigation and reflective discussion |
| Surakarta Public High School No. 4 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through authentic geographical problem solving                |
| Surakarta Public High School No. 5 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through experiential and inquiry learning                     |
| Surakarta Public High School No. 6 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through collaborative spatial analysis                        |

| School                             | Teacher Interview | Student Interview | Classroom Observation | Supporting Documents | Cross-case Synthesis                                                      |
|------------------------------------|-------------------|-------------------|-----------------------|----------------------|---------------------------------------------------------------------------|
| Surakarta Public High School No. 7 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through contextual environmental learning      |
| Surakarta Public High School No. 8 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through inquiry and field observation          |
| Surakarta Public High School No. 9 | ✓                 | ✓                 | ✓                     | ✓                    | Four dimensions identified through project-based environmental activities |

(Source: Research findings, 2026)



**Figure 4.** Cross-Case Spatial Mapping of Holistic Learning Implementation through Indonesia's Deep Learning Pedagogy (Source: Developed by Researchers, 2026)

**Figure 4**, presents a spatial synthesis of the cross-case findings across the nine participating secondary schools. The visualization was developed from the thematic analysis summarized in **Table 4** and illustrates how the four dimensions of holistic learning were manifested through geography learning practices in each school. Rather than representing quantitative scores

or school rankings, the figure visualizes qualitative evidence derived from the triangulation of teacher interviews, student interviews, classroom observations, and supporting documents.

Across all participating schools, the four dimensions of holistic learning were consistently identified, indicating that Indonesia's Deep Learning Pedagogy had

been implemented through diverse instructional practices. Nevertheless, the analysis revealed contextual variations in the emphasis on these dimensions. Some schools demonstrated stronger implementation through inquiry-based geographical investigations and authentic environmental problem-solving, whereas others placed greater emphasis on collaborative learning, environmental stewardship, or experiential field activities. These variations were associated with differences in pedagogical practices, learning resources, and opportunities for contextual geography learning rather than differences in educational quality.

The cross-case overview presented in Figure 4 provides the analytical foundation for the following thematic sections, which examine each holistic learning dimension in greater depth, drawing on evidence from teacher interviews, student interviews, and classroom observations.

The cross-case findings demonstrate that Indonesia's Deep Learning Pedagogy supports holistic learning by integrating intellectual development, character and moral development, social and emotional development, and physical and active engagement within geography instruction. Rather than functioning as separate learning outcomes, these four dimensions were observed to be complementary manifestations of holistic learning that emerged from authentic geography learning experiences. This finding reinforces the view that holistic learning is achieved through the integration of cognitive, affective, and social domains within a coherent learning ecosystem (Koul & Nayar, 2021).

The findings also highlight the distinctive contribution of geography education to holistic learning. Inquiry-based investigations, spatial problem-solving, environmental analysis, and contextual learning enabled students to develop higher-order thinking while simultaneously fostering responsibility, collaboration, and environmental awareness. This suggests that geography provides an authentic pedagogical context in which intellectual growth is closely connected with students'

social and moral development. These findings support Virranmäki et al. (2021), who argue that geography education extends beyond conceptual understanding by cultivating higher-order thinking and responsible citizenship.

Furthermore, the observed learning practices reflect the fundamental principles of Indonesia's Deep Learning Pedagogy, namely joyful, mindful, and meaningful learning. Students actively engaged with real-world geographical issues through collaborative inquiry, field-based activities, and reflective learning experiences, thereby connecting knowledge to personal experiences and community contexts (Syafi'i & Darnaningsih, 2025). Such experiential learning strengthens the integration of understanding, reflection, and action (Fromm et al., 2021).

Overall, these findings suggest that the implementation of Indonesia's Deep Learning Pedagogy extends beyond curriculum implementation by providing a pedagogical pathway for holistic student development in geography education. Consistent with Nugroho et al. (2025), the findings indicate that the Merdeka Curriculum encourages more student-centred and contextual learning. More importantly, this study contributes to the literature by demonstrating how geography learning can operationalize the four dimensions of holistic learning through authentic pedagogical practices, thereby providing an empirical framework that may inform holistic geography education in comparable educational contexts.

### Intellectual Development

The cross-case analysis revealed that intellectual development was consistently manifested across the nine participating secondary schools through learning practices that promoted inquiry, critical analysis, contextual problem-solving, and reflective thinking. As summarized in Table 5, geography teachers designed learning experiences that encouraged students to move beyond factual recall to analyze geographical phenomena, evaluate alternative solutions, and construct

evidence-based explanations. These findings indicate that intellectual development was embedded within authentic learning

activities rather than being treated as an isolated cognitive outcome.

**Table 5.** Cross-Case Manifestations of Intellectual Development in Geography Learning

| Manifestation              | Evidence from Cross-Case Analysis                                                                                                                                                                                                                    | Interpretation                                                                                                                                                                                                                | Connection to Deep Learning Pedagogy                                                                                                                                                            |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inquiry-based learning     | Teachers consistently facilitated learning through questioning, investigation, and geographical inquiry activities.                                                                                                                                  | Inquiry encouraged students to construct knowledge actively rather than receiving information passively. Geography learning promoted higher-order thinking by engaging students in analysing authentic geographical problems. | Inquiry-oriented learning operationalized joyful and meaningful learning by engaging students actively in exploring geographical phenomena and constructing knowledge from authentic questions. |
| Critical Thinking          | Students analysed environmental and spatial issues using evidence from maps, case studies, and classroom discussions.                                                                                                                                |                                                                                                                                                                                                                               | Analytical engagement supported meaningful learning by connecting geographical reasoning with authentic problems and evidence-based interpretation.                                             |
| Contextual problem-solving | Learning activities connected geographical concepts with local environmental, disaster, and sustainability issues. Classroom discussions and learning reflections encouraged students to evaluate geographical phenomena from multiple perspectives. | Students demonstrated the ability to relate theoretical concepts to real-world contexts.                                                                                                                                      | Contextual problem-solving operationalized meaningful learning by connecting geographical concepts with students' real-world contexts and experiences.                                          |
| Reflective understanding   |                                                                                                                                                                                                                                                      | Reflection strengthened conceptual understanding and supported meaningful learning experiences.                                                                                                                               | Reflection operationalized mindful learning by encouraging students to examine their understanding, perspectives, and learning experiences.                                                     |

(Source: Synthesized from teacher interviews, student interviews, classroom observations, and supporting learning documents.)

Across the participating schools, students were regularly engaged in analyzing environmental and spatial issues relevant to their local contexts. Classroom observations showed that teachers frequently incorporated discussions of contemporary geographical problems, case-based learning, and inquiry-oriented activities that required students to identify causal relationships, interpret geographical information, and justify their conclusions using evidence. Student interviews further confirmed that these learning experiences encouraged them to connect geographical concepts to real-world situations in their communities, thereby strengthening conceptual understanding through contextual application. These practices also illustrate how the principles of Indonesia's Deep Learning Pedagogy were translated into intellectual engagement: inquiry and active investigation supported joyful learning, reflection encouraged mindful engagement with ideas and learning experiences, and contextual application strengthened meaningful learning.

Although similar instructional patterns were identified across all schools, implementation varied with classroom context and available learning opportunities. Schools with greater access to field-based activities provided richer opportunities for direct environmental investigation and experiential inquiry, whereas other schools achieved comparable intellectual engagement through classroom discussions, spatial analysis, and contextual case studies. These findings suggest that intellectual development was influenced more by teachers' pedagogical strategies than by differences in school characteristics. The cross-case variation therefore concerned the form and intensity of learning experiences rather than the underlying pedagogical orientation: across different school contexts, teachers adapted inquiry, reflection, and contextual problem-solving to facilitate joyful, mindful, and meaningful engagement with geographical knowledge.

The findings demonstrate that intellectual development in geography education extends beyond conceptual

mastery toward the cultivation of higher-order thinking through authentic geographical inquiry. By engaging students in analyzing environmental problems, interpreting spatial information, and evaluating alternative solutions, geography learning provides opportunities to integrate critical thinking with contextual decision-making. In this process, the four dimensions of holistic learning should not be understood as separate outcomes. Intellectual development was enacted through learning experiences that simultaneously encouraged active engagement, reflection, contextual understanding, and the application of geographical knowledge to authentic problems. These findings are consistent with [Chen \(2021\)](#), who emphasizes that integrating critical and creative thinking is fundamental to geoscience education, and with [Sugiyanto et al. \(2021\)](#), who highlight the role of geography learning in strengthening geographical literacy and higher-order thinking skills.

Furthermore, the prominence of inquiry, reflection, and contextual problem-solving demonstrates how Indonesia's Deep Learning Pedagogy can be operationalized to foster intellectual development. Inquiry provides opportunities for active and engaging knowledge construction, reflecting the joyful dimension of learning; reflection encourages students to examine their understanding and perspectives, reflecting the mindful dimension; while contextual problem-solving connects geographical knowledge with authentic environmental and societal issues, reflecting the meaningful dimension. In this way, joyful, mindful, and meaningful learning are not treated as separate instructional components but as complementary principles through which students develop higher-order geographical thinking. Inquiry-based geography learning strengthens students' capacity to investigate complex geographical issues, reflect on their learning experiences, and apply geographical reasoning to address environmental and societal challenges ([Bonello et al., 2025](#); [Jarilkapovich, 2025](#); [Lee & Kriewaldt, 2025](#); [Silviariza et al., 2021](#)).

Overall, the findings demonstrate that intellectual development within Indonesia's Deep Learning Pedagogy is characterized by students' active engagement in inquiry, analysis, reflection, and contextual reasoning. Analytically, the findings suggest that the intellectual dimension is strengthened when the joyful, mindful, and meaningful principles of Deep Learning Pedagogy are translated into geography-specific practices such as inquiry, reflection, and contextual problem-solving. Rather than emphasizing memorization, geography learning positioned students as active constructors of knowledge who interpreted geographical phenomena through authentic and meaningful learning experiences. This relationship illustrates how the pedagogical principles provide the orientation, geography learning practices provide the mechanism of enactment, and intellectual development represents one of the interconnected dimensions of holistic student development.

### Character and Moral Development

Character and moral development was embedded throughout geography learning as students engaged with authentic environmental and societal issues. Table 6 summarizes how responsibility, environmental stewardship, moral reasoning, and civic awareness were integrated into classroom learning, enabling students to connect geographical knowledge with ethical decision-making and responsible action. As presented in **Table 6**, this dimension was reflected in learning activities that promoted environmental responsibility, ethical reasoning, personal accountability, and civic awareness. Rather than being delivered as separate moral instruction, these values were integrated into the exploration of authentic geographical issues, allowing students to connect geographical knowledge with responsible attitudes and decision-making.

**Table 6.** Cross-Case Manifestations of Character and Moral Development in Geography Learning

| Manifestation                | Evidence from Cross-Case Analysis                                                                                                       | Interpretation                                                                                              | Connection to Deep Learning Pedagogy                                                                                                                          |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental responsibility | Students were encouraged to understand the consequences of environmental issues and identify responsible actions.                       | Geography learning strengthened students' awareness of environmental stewardship and sustainable behaviour. | Authentic environmental issues supported meaningful learning by connecting geographical knowledge with responsible action in real-world contexts.             |
| Moral reasoning              | Learning activities required students to evaluate environmental and social issues from ethical perspectives before proposing solutions. | Students developed moral judgement alongside conceptual understanding.                                      | Ethical reflection supported mindful learning by encouraging students to consider consequences, values, and alternative perspectives before making decisions. |
| Responsibility               | Teachers consistently promoted accountability during                                                                                    | Responsibility was embedded within authentic learning processes rather                                      | Collaborative and active participation created opportunities for joyful and meaningful learning through shared                                                |

| Manifestation      | Evidence from Cross-Case Analysis                                                                                                                                                                                   | Interpretation                                                                                                           | Connection to Deep Learning Pedagogy                                                                                                                                                                  |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Citizenship values | collaborative tasks, project completion, and classroom participation. Discussions on disasters, sustainability, and local environmental issues encouraged students to consider their roles as responsible citizens. | than taught explicitly.<br><br>Geography learning fostered civic responsibility through contextual learning experiences. | responsibility and purposeful engagement.<br><br>Contextual civic issues supported meaningful learning by connecting geographical understanding with students' roles and responsibilities in society. |

(Source: Synthesized from teacher interviews, student interviews, classroom observations, and supporting learning documents)

Across the participating schools, geography teachers consistently incorporated environmental and societal issues into classroom learning. Students were encouraged to examine the causes and impacts of environmental degradation, disasters, urban development, and sustainability challenges while considering their ethical responsibilities toward communities and the natural environment. Classroom observations indicated that collaborative discussions and contextual problem-solving frequently required students to justify their opinions based on both scientific evidence and social responsibility. Student interviews further suggested that these learning experiences strengthened their awareness of environmental conservation and responsible citizenship. These practices demonstrate how Deep Learning Pedagogy was translated into character and moral development: meaningful learning emerged through engagement with authentic environmental and societal problems, while mindful learning was reflected in students' consideration of ethical consequences and responsibilities. Collaborative participation additionally created opportunities for active and purposeful engagement in developing responsibility toward others and the environment.

Although the general pattern was evident across all schools, contextual differences emerged in the emphasis placed on character development. Schools that regularly implemented project-based and community-oriented learning provided broader opportunities for students to demonstrate responsibility through authentic environmental actions. Meanwhile, other schools emphasized character development through reflective discussions, classroom collaboration, and case-based analysis of geographical issues. These variations indicate that the principles of Deep Learning Pedagogy were enacted through different instructional forms according to school and classroom contexts. Despite these differences, the underlying process remained consistent: students encountered meaningful geographical issues, reflected on their ethical and social implications, and participated actively in learning activities that required responsibility and cooperation.

The findings indicate that geography education provides a meaningful context for integrating cognitive learning with character formation. By engaging students in analyzing environmental degradation, disaster risk, sustainability, and community issues, geography learning encourages students not only to understand geographical phenomena but also to

consider their ethical responsibilities toward society and the environment. The findings therefore suggest that character and moral development is not an additional outcome imposed on geography learning but can emerge through the integration of meaningful geographical contexts, mindful reflection, and responsible participation. This supports the perspective of holistic learning, which emphasizes that intellectual development should be accompanied by the cultivation of values, responsibility, and moral awareness to prepare students for complex societal challenges (Koul & Nayar, 2021).

Furthermore, the integration of environmental responsibility, moral reasoning, and civic awareness reflects the core principles of Indonesia's Deep Learning Pedagogy, in which meaningful learning extends beyond conceptual understanding toward responsible action (Adisaputera et al., 2023). Mindful learning was manifested when students reflected on the ethical consequences of environmental and social problems and considered different perspectives before proposing solutions. Joyful learning, although less directly associated with moral reasoning itself, was reflected in active, collaborative learning experiences in which students participated purposefully in shared tasks and developed a sense of accountability toward peers and their learning environment. Thus, character

and moral development emerged through the integration of inquiry, reflection, contextual problem-solving, and collaboration rather than through direct moral instruction.

Analytically, the findings show that Deep Learning Pedagogy provides the pedagogical orientation through which geography-specific practices such as contextual problem-solving, reflection, collaboration, and environmental exploration can foster character and moral development. Meaningful engagement connects students with authentic problems, mindful engagement supports ethical reflection, and active participation provides opportunities to enact responsibility. Character and moral development therefore constitute an interconnected dimension of holistic learning rather than a separate instructional component.

### Social and Emotional Development

Social and emotional development was reflected in students' interactions during collaborative and inquiry-oriented geography learning. As shown in **Table 7**, learning activities promoted communication, teamwork, empathy, and respect for diverse perspectives while students explored authentic geographical issues and developed shared solutions to environmental and social challenges.

**Table 7.** Cross-Case Manifestations of Social and Emotional Development in Geography Learning

| Manifestation | Evidence from Cross-Case Analysis                                                         | Interpretation                                                                                 | Connection to Deep Learning Pedagogy                                                                                               |
|---------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Collaboration | Students worked collaboratively during inquiry, discussion, and project-based activities. | Collaborative learning strengthened teamwork and shared problem-solving in geography learning. | Active collaboration supported joyful learning by creating engaging social learning experiences and shared knowledge construction. |
| Communication | Students actively exchanged ideas, presented arguments, and                               | Communication skills developed through evidence-                                               | Discussion and presentation supported joyful and meaningful learning                                                               |

| Manifestation | Evidence from Cross-Case Analysis                                                                                                                                                                                                                                                                                          | Interpretation                                                                                                                              | Connection to Deep Learning Pedagogy                                                                                                                                                                                                |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Empathy       | communicated geographical findings during classroom activities. Learning activities involving environmental degradation, disasters, and community issues encouraged students to consider different social perspectives. Students appreciated different viewpoints during collaborative learning and classroom discussions. | based discussion and presentation.<br><br>Geography learning fostered empathy toward affected communities and environmental sustainability. | through active participation and purposeful exchange of ideas.<br><br>Engagement with authentic social and environmental issues supported meaningful learning, while considering different perspectives reflected mindful learning. |
|               | Respect for diversity                                                                                                                                                                                                                                                                                                      | Social interaction promoted inclusive learning and mutual respect among students.                                                           | Listening to and reflecting on diverse perspectives supported mindful learning and strengthened respectful social interaction.                                                                                                      |

(Source: Synthesized from teacher interviews, student interviews, classroom observations, and supporting learning documents)

Across the participating schools, collaborative learning was consistently integrated into inquiry-based activities, group discussions, project-based learning, and environmental investigations. Classroom observations indicated that students were encouraged to exchange ideas, negotiate alternative explanations, and present evidence-based conclusions while analyzing geographical phenomena. Student interviews further suggested that these collaborative experiences enhanced their confidence in expressing opinions, listening to different perspectives, and working collectively to address geographical problems relevant to their local communities. These practices illustrate how the joyful dimension of Indonesia's Deep Learning Pedagogy can be enacted through active social participation, while the exchange of perspectives and shared construction of knowledge also creates opportunities for mindful engagement with

others and meaningful engagement with authentic geographical problems.

The cross-case findings also demonstrated that geography learning promoted empathy and social responsibility through discussions of environmental degradation, disaster mitigation, sustainable development, and community-related issues. By examining real-world geographical challenges, students were encouraged to consider the impacts of environmental change on individuals and communities and to reflect on their own roles in promoting sustainable practices. Although these patterns were evident across all schools, implementation varied with teachers' instructional approaches and opportunities for contextual learning, particularly in schools that incorporated field observations and community-based activities. The variation was therefore primarily related to the learning contexts through which social and emotional development was facilitated, rather than to a

difference in the underlying pedagogical orientation. Across contexts, authentic geographical issues provided meaningful situations for students to engage with others, while reflection on different social perspectives supported mindful interpersonal engagement.

The findings demonstrate that geography education provides an effective context for fostering social and emotional development through collaborative inquiry and authentic engagement with environmental and societal issues. Rather than treating collaboration and empathy as complementary skills, the learning process integrated these competencies into the investigation of geographical phenomena, enabling students to develop interpersonal understanding alongside conceptual knowledge. This integration indicates that social and emotional development was not produced by a separate set of social-emotional activities but emerged through the interaction between geography-specific learning practices and the principles of Deep Learning Pedagogy. This finding supports the holistic learning perspective, which emphasizes that meaningful education should integrate cognitive, emotional, and social dimensions to promote comprehensive student development (Hsbollah & Hassan, 2022; Nollmeyer & Wig, 2022).

Furthermore, the prominence of collaborative discussion, communication, and contextual problem-solving reflects the learner-centered principles of Indonesia's Deep Learning Pedagogy, in which joyful, mindful, and meaningful learning is achieved through active participation and shared knowledge construction (Ambarita et al., 2025). Collaboration and communication are recognized as fundamental competencies for 21st-century learning, while meaningful engagement with authentic social and environmental issues strengthens students' empathy, social awareness, and responsible participation (González-Pérez & Ramírez-Montoya, 2022). These findings also align with Chiu (2021),

who argues that holistic education promotes students' emotional and social growth by creating learning experiences that connect academic knowledge with real-life interactions. Consequently, learning about geography contributes not only to students' understanding of spatial phenomena but also to the development of socially responsible citizens capable of working collaboratively to address contemporary environmental challenges.

Overall, the findings indicate that social and emotional development was embedded within authentic geography learning experiences rather than taught as an independent competency. The integration of collaboration, communication, empathy, and respect for diversity reflects the capacity of Indonesia's Deep Learning Pedagogy to create meaningful learning environments that support both academic understanding and interpersonal development. Analytically, the findings show that geography-specific practices provide the means by which the three principles of Deep Learning Pedagogy are translated into social and emotional development: active collaboration facilitates joyful engagement; reflection on diverse perspectives facilitates mindful engagement; and authentic geographical problems facilitate meaningful engagement. Social and emotional development therefore functions as an interconnected dimension of holistic learning rather than as a separate competency.

### **Physical and Active Engagement**

Physical and active engagement was manifested through students' direct participation in experiential and inquiry-based geography learning. As summarized in Table 8, active involvement in field observations, collaborative investigations, environmental exploration, and contextual learning enabled students to construct geographical understanding through authentic experience rather than passive knowledge acquisition.

**Table 8.** Cross-Case Manifestations of Physical and Active Engagement in Geography Learning

| Manifestation                  | Evidence from Cross-Case Analysis                                                                                            | Interpretation                                                                                                 | Connection to Deep Learning Pedagogy                                                                                                                                                 |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Active classroom participation | Students actively participated in discussions, collaborative tasks, presentations, and classroom investigations.             | Learning encouraged active engagement rather than passive knowledge acquisition.                               | Active participation supported joyful learning by engaging students directly in collaborative and participatory learning experiences.                                                |
| Experiential learning          | Students engaged in environmental observations, contextual investigations, and project-based activities.                     | Direct learning experiences strengthened the connection between geographical concepts and real-world contexts. | Experiential learning supported meaningful learning by connecting geographical knowledge with direct experience and authentic contexts.                                              |
| Field-based learning           | Several schools incorporated outdoor observations and environmental exploration to support geographical inquiry.             | Authentic field experiences enhanced spatial understanding and contextual learning.                            | Field-based inquiry supported meaningful and mindful learning by enabling students to directly observe geographical phenomena and reflect on their characteristics and implications. |
| Learning by doing              | Students applied geographical concepts through practical investigations, environmental analysis, and collaborative projects. | Active participation promoted meaningful learning through experience and reflection.                           | Learning by doing integrated joyful, mindful, and meaningful learning through active participation, reflection on experience, and application of knowledge to authentic problems.    |

(Source: Synthesized from teacher interviews, student interviews, classroom observations, and supporting learning documents)

Across the participating schools, students actively engaged in inquiry-based learning through classroom discussions, collaborative projects, environmental observations, and contextual investigations. Classroom observations indicated that teachers consistently encouraged students to participate in analyzing geographical problems, presenting findings, and working collaboratively to interpret environmental and spatial phenomena. Student interviews

further suggested that learning activities involving direct observation and contextual exploration enhanced their motivation and enabled them to understand geographical concepts more meaningfully than conventional classroom instruction. These practices demonstrate how Deep Learning Pedagogy was translated into physical and active engagement: active participation created opportunities for joyful involvement, direct observation encouraged

mindful attention to geographical phenomena, and contextual exploration connected learning experiences with meaningful geographical knowledge.

The cross-case findings also revealed contextual differences in the implementation of active learning experiences. Schools with greater opportunities for outdoor learning incorporated field observations, environmental exploration, and community-based activities that allowed students to investigate geographical issues directly. In contrast, schools with more limited access to field activities promoted active engagement through classroom simulations, collaborative problem-solving, digital mapping, and case-based investigations. Despite these differences, all schools demonstrated a shared commitment to creating student-centered learning environments that promoted active participation throughout the learning process. The variation therefore concerned the form through which active engagement was enacted rather than the presence of the underlying pedagogical orientation. Whether through field-based experiences or classroom-based simulations and investigations, teachers created opportunities for students to engage actively, attend to geographical phenomena, and connect learning with authentic contexts.

The findings demonstrate that active engagement constitutes an essential component of holistic geography education because meaningful understanding develops through students' direct interaction with geographical phenomena rather than through passive content transmission. By participating in field observations, collaborative investigations, environmental exploration, and contextual problem-solving, students experienced geography as an inquiry-oriented discipline that connects conceptual knowledge with authentic learning experiences. This finding also indicates that physical and active engagement is not merely a behavioral dimension of participation; it functions as a mechanism through which students encounter, interpret, and apply geographical

knowledge. These findings support [Fromm et al. \(2021\)](#), who argue that experiential learning promotes deeper understanding through the integration of experience, reflection, and action.

Furthermore, the prominence of active participation reflects the learner-centered principles of Indonesia's Deep Learning Pedagogy, particularly its emphasis on joyful, mindful, and meaningful learning. Joyful learning was manifested through students' active participation in collaborative investigations, practical activities, and learning by doing, which created engaging experiences rather than passive reception of information. Mindful learning was reflected in students' direct observation, interpretation, and reflection on geographical phenomena encountered through classroom and field-based activities. Meaningful learning was most evident when students connected these experiences with authentic geographical problems and applied geographical concepts to real-world contexts. These findings are consistent with [McPhee \(2022\)](#), who emphasizes that geography learning becomes more meaningful when students engage directly with real-world spatial contexts, and with [Virranmäki et al. \(2021\)](#), who identify experiential geographical inquiry as a key mechanism for developing higher-order geographical thinking. Consequently, this study suggests that physical and active engagement functions not merely as classroom participation but as a pedagogical strategy through which geography education operationalizes holistic learning within Indonesia's Deep Learning Pedagogy.

Overall, the findings indicate that physical and active engagement was manifested not merely through physical movement but through students' active involvement in constructing geographical understanding. The integration of experiential learning, collaborative inquiry, and contextual investigation illustrates how Indonesia's Deep Learning Pedagogy facilitates meaningful learning by encouraging students to interact directly with geographical phenomena and apply

their knowledge in authentic contexts. Analytically, the findings show that active engagement provides an experiential mechanism that connects the pedagogical principles of Deep Learning Pedagogy with holistic student development: joyful engagement encourages active participation, mindful engagement supports attentive observation and reflection, and meaningful engagement connects experience to authentic geographical contexts. Physical and active engagement therefore functions as an interconnected dimension of holistic learning rather than as a separate behavioral outcome.

### **A Holistic Learning Model for Geography Education**

The findings of this study suggest that holistic learning in geography education is best understood as an integrated pedagogical process rather than as the implementation of four independent developmental dimensions. Across the participating schools, intellectual development, character and moral development, social and emotional development, and physical and active engagement consistently emerged through interconnected learning experiences grounded in inquiry, contextual problem-solving, collaboration, reflection, and environmental exploration. This indicates that Indonesia's Deep Learning Pedagogy functions not merely as a curriculum initiative but as a pedagogical framework that operationalizes holistic learning in secondary geography education (Alim et al., 2025).

The study extends the current literature in two important ways. First, while previous studies have predominantly examined Indonesia's Deep Learning Pedagogy from the perspectives of policy implementation, teacher readiness, or conceptual understanding (Prihantoro et al., 2025; Waloyo et al., 2026), this study provides empirical evidence of how its principles are enacted in everyday geography teaching practices. Second, although holistic learning has frequently been discussed as a broad educational

philosophy (Chiu, 2021; Koul & Nayar, 2021), limited attention has been paid to how its dimensions manifest in subject-specific instruction. By demonstrating how the four dimensions interact throughout the geography curriculum, this study offers a practical interpretation of holistic learning grounded in classroom practice.

Importantly, the conceptual framework presented in **Figure 1** and the Holistic Geography Learning Model presented in **Figure 5** serve different functions. **Figure 1** was developed a priori from the study's conceptual and theoretical foundations and served as an analytical lens for formulating the research questions, guiding data collection, and organizing the initial deductive coding. In contrast, **Figure 5** was developed through the synthesis of empirical findings from the participating schools. Thus, Figure 5 does not simply reproduce the initial conceptual framework; rather, it specifies how the framework was manifested and operationalized through subject-specific geography learning practices identified in the empirical data.

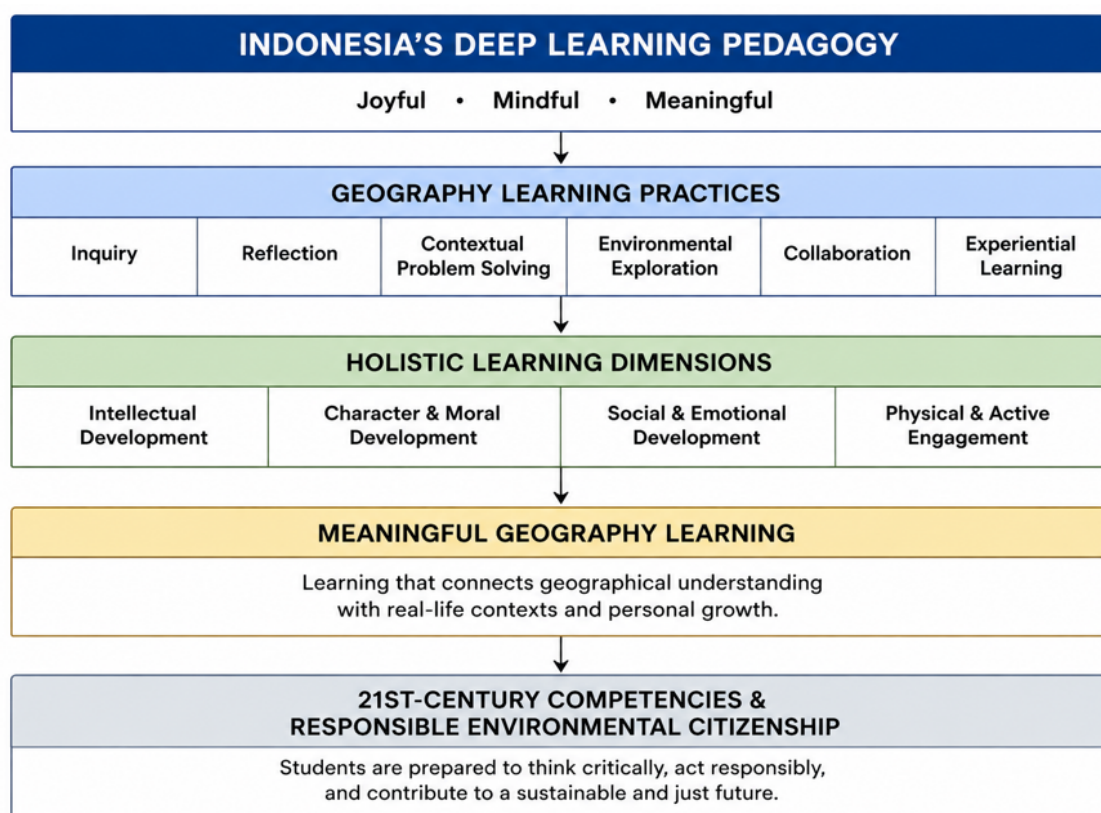
From a disciplinary perspective, the findings highlight the distinctive contribution of geography education to holistic student development. Geography learning naturally integrates spatial inquiry, environmental responsibility, collaborative investigation, and experiential learning, creating opportunities for students to develop cognitive, social, moral, and behavioral competencies simultaneously. The cross-case findings further indicate that these practices do not operate in isolation as instructional strategies. Instead, they function as interconnected modes of learning through which the four dimensions of holistic development are simultaneously activated. Rather than positioning these competencies as separate educational objectives, this study therefore proposes that meaningful geography learning emerges through their continuous integration within authentic geographical contexts.

Based on these findings, this study proposes a Holistic Geography Learning Model, in which Indonesia's Deep Learning Pedagogy serves as the pedagogical

foundation for geography learning practices. The empirical synthesis identifies six interconnected geography learning practices inquiry, reflection, contextual problem-solving, environmental exploration, collaboration, and experiential learning through which the four dimensions of holistic learning are enacted. These practices represent the subject-specific operationalization of the pedagogical framework identified through the empirical data. The model further indicates that the integration of these practices and holistic learning dimensions contributes to meaningful geography learning and supports the development of competencies relevant to responsible environmental citizenship.

As illustrated in **Figure 5**, the proposed model synthesizes the empirical findings of this study into an integrated subject-specific model. Its contribution lies in making explicit the pedagogical pathway between Indonesia's Deep Learning

Pedagogy and holistic learning in geography education: the pedagogy provides the overarching foundation, geography-specific learning practices provide the mechanisms through which it is enacted, and the four holistic dimensions represent interconnected domains of student development. Meaningful geography learning and the development of 21st-century competencies and responsible environmental citizenship are positioned as broader outcomes of this integrated process. Rather than representing a rigid or sequential instructional procedure or implying causal relationships, the model provides an empirically grounded interpretation of how these elements are interconnected across the participating school contexts. In this respect, the model extends the initial conceptual framework by translating its broad relationships into a subject-specific account of how holistic learning is enacted in secondary geography education.



**Figure 5.** Proposed Holistic Geography Learning Model Based on the Findings  
(Source: Developed by Researchers, 2026)

## CONFLICTS OF INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTION

**AEJKN** designed the study, collected and analyzed the data, and drafted the manuscript. **SS** supervised the research process, contributed to data interpretation, and reviewed the manuscript. **SP** contributed to conceptual development, validated the findings, and critically revised the manuscript. All authors approved the final version of the manuscript.

## CONCLUSION

This study demonstrates that Indonesia's Deep Learning Pedagogy supports holistic learning in secondary geography education through the interconnected development of Intellectual Development, Character and Moral Development, Social and Emotional Development, and Physical and Active Engagement. These dimensions were not manifested as separate outcomes but emerged through integrated inquiry-based, contextual, collaborative, reflective, and experiential learning practices. The findings highlight geography education as an authentic context for developing higher-order thinking, environmental responsibility, interpersonal competencies, and active engagement with real-world geographical issues. Based on these findings, the study proposes a Holistic Geography Learning Model that clarifies how Deep Learning Pedagogy is enacted through geography-specific learning practices to foster interconnected dimensions of holistic student development. The model extends existing holistic learning perspectives by demonstrating their operationalization within subject-specific pedagogy and provides a basis for future research and practical guidance for geography teachers. This study was limited to public senior high schools in Surakarta and focused on implementation rather than its effects on student learning outcomes. Future research should examine the model across diverse educational contexts, incorporate broader stakeholder perspectives, and investigate its

contribution to geographical thinking, environmental citizenship, and sustainability competence.

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