



Integrating Culture and Environment into High School Geography Education for Sustainable Development

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Abstract: This article explores the integration of cultural and environmental dimensions into geography education within the framework of Vietnam's 2018 General Education Curriculum. While geography inherently connects natural and social sciences, cultural and environmental aspects remain underemphasized in classroom practice. To address this gap, the article develops a theoretical foundation linking integration, interdisciplinarity, and "Education for Sustainable Development" (ESD). It then analyses the upper secondary geography curriculum (Grades 10-12), identifying thematic entry points – Humans and Nature, Geography of Economic Sectors, World Socio-Economic Geography, and Regional Development – that provide opportunities for localized teaching themes (e.g., indigenous knowledge in the Northwest, sustainable tourism in Ha Long Bay, urbanization in Ho Chi Minh City, and community-based tourism in the Central Highlands). Drawing on the results of surveys of teachers and students, the article highlights both the potential benefits and challenges of applying integration in practice. To support pedagogical implementation, a seven-step process is proposed to guide teachers from defining objectives to reflection and adjustment. This process demonstrates how cultural and environmental integration can enrich geography education, foster students' problem-solving and civic competencies, and contribute to ESD goals. The article thus offers practical insights for curriculum developers, educators, and policymakers seeking to strengthen the transformative role of geography in promoting sustainable development.

Keywords: geography education; upper secondary school; interdisciplinary approach; sustainable development.

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1. Introduction

In an era characterised by accelerating globalization and intensifying socio-environmental challenges, education plays a

pivotal role in shaping learners' values, competencies, and behaviours regarding sustainable development. At the upper secondary level, geography serves not only as a medium for imparting knowledge about spatial structures and natural-social phenomena, but also as a unique platform for integrating knowledge, skills, and life values. Such integration contributes to the

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cultivation of global citizenship competencies and the fostering of environmental responsibility (UNESCO 2017).

The inclusion of cultural and environmental dimensions in geography instruction underscores the inherently interdisciplinary nature of the subject, aligning with contemporary educational paradigms that view teaching as more than the transmission of factual knowledge. Instead, it is a process of fostering systems thinking and critical awareness, and inspiring sustainable action. Culture reflects identity, traditions, and indigenous knowledge – essential components shaping human-environment interactions – while environmental education deepens students' understanding of humanity's role in ecosystems and develops their capacity for natural resource stewardship (Tilbury 2011; UNESCO 2005).

Vietnam's 2018 General Education Curriculum emphasizes competency-based learning, interdisciplinary integration, and the application of knowledge to real-life contexts. Geography is explicitly positioned as a subject contributing to sustainable development and responsible citizenship (Ministry of Education and Training 2018). This policy framework creates favourable conditions for embedding cultural and environmental content into geography instruction. Nevertheless, in practice, integrating cultural and environmental elements into upper secondary geography education continues to face substantial challenges, ranging from teacher awareness and resource availability to the adoption of appropriate pedagogical strategies. Many teachers still lack systematic models to guide interdisciplinary lesson design, while teaching time and materials remain limited.

Although international scholarship has extensively discussed "Education for

Sustainable Development" (ESD), place-based education, and integrated curriculum approaches (Jacobs 1989; Drake and Burns 2004; Fogarty and Pete 2009; He et al. 2022; Stoltenberg and Lattanzio 2023), there remains a notable gap in studies that operationalize these frameworks within the specific context of Vietnam's upper secondary geography curriculum. Few studies identify concrete curriculum entry points or propose structured pedagogical processes grounded in empirical classroom data. This gap limits teachers' ability to translate curriculum reform orientations into effective teaching practices.

Responding to these practical demands and the broader trajectory of educational reform, this article seeks to elucidate the theoretical and practical foundations of integrating cultural and environmental content into geography instruction. It combines curriculum analysis with survey data from teachers and students to examine current perceptions, practices, and constraints. It further proposes a sustainable development-oriented pedagogical framework and a seven-step process designed to enhance instructional quality and advance the goals of sustainable development within the Vietnamese upper secondary school system.

Specifically, this article addresses the following research questions: (i) How do upper secondary geography teachers and students in Vietnam perceive the integration of cultural and environmental dimensions? (ii) What challenges and enabling factors influence the feasibility of such integration in classroom practice? (iii) How can empirical findings inform the design of a pedagogical framework for sustainable development-oriented geography education?

Through this approach, the article aims to provide both theoretical insights and practical guidance for teachers, curriculum

developers, and policymakers in Vietnam, contributing to the enhancement of geography education in line with current curriculum reform and sustainable development goals.

2. Theoretical Framework

2.1. Integration and Interdisciplinary Approaches in Geography Education

Integration in education is broadly understood as the process of linking knowledge, skills, values, and methods from different domains to create more holistic learning experiences. Jacobs (1989) emphasises that integration is not simply the aggregation of disciplinary content but the deliberate combination of perspectives, fostering connections that enhance students' higher-order thinking. Scholars have classified integration into different levels: intradisciplinary (linkages within a single discipline), multidisciplinary (parallel treatment of disciplines around a common theme), interdisciplinary (synthesis of knowledge and methods across subjects), and transdisciplinary (problem-based learning beyond disciplinary boundaries) (Drake and Burns 2004; Fogarty and Pete 2009).

More recent scholarship has further refined these typologies by emphasizing the continuum and dynamic nature of curriculum integration. For example, Boix Mansilla (2021) conceptualizes interdisciplinary learning as the purposeful integration of disciplinary knowledge and practices to address complex real-world problems, highlighting epistemic reflexivity and transfer. Similarly, Repko et al. (2020) argue that interdisciplinary teaching requires explicit strategies for synthesizing perspectives rather than merely juxtaposing content.

In geography education, interdisciplinary integration is particularly significant, as the

subject inherently bridges natural and social sciences. For example, lessons on climate change require knowledge from physical geography, environmental science, and economics, while topics on cultural landscapes connect human geography, history, and anthropology. This interdisciplinary integration strengthens students' capacity for critical thinking, synthesis, and practical problem-solving-skills essential for addressing sustainability challenges (Beane 1997; Lambert and Morgan 2010). Recent studies further demonstrate that integrated geography instruction enhances students' spatial thinking and systems reasoning. For instance, Kidman and Chang (2023) show that interdisciplinary geography curricula improve students' ability to analyse socio-environmental issues across scales. Wilmot and Bednarz (2025) also emphasize that geography classrooms are increasingly conceptualized as spaces for transformative learning rather than mere knowledge transmission.

2.2. Education for Sustainable development (ESD)

ESD has been promoted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) since the early 21st century as a transformative vision of education that prepares learners for responsible citizenship and sustainable futures. UNESCO (2017) defines ESD as a process that equips learners with the knowledge, skills, values, and attitudes needed to make informed decisions and take responsible actions for environmental integrity, economic viability, and social justice – both now and in the future.

Building on this foundation, UNESCO's most recent framework, ESD for 2030 (UNESCO 2020), further emphasizes the role of education in enabling societal transformation through systems thinking, anticipatory competence, and collective action. This framework highlights

integration and interdisciplinarity as core pedagogical principles for achieving Sustainable Development Goals.

ESD emphasizes integration as a core pedagogical principle. Instead of existing as a separate subject, sustainability themes are embedded across curricula through interdisciplinary and transdisciplinary approaches. Within geography education, ESD is evident in topics such as climate change, disaster risk reduction, sustainable urbanization, biodiversity conservation, cultural heritage, and local community development. This requires geography educators to move beyond content delivery, adopting strategies that support students in developing competencies such as critical thinking, systems analysis, collaboration, and civic engagement (Drake and Burns 2004; Fogarty and Pete 2009).

Recent empirical studies confirm the effectiveness of ESD-oriented pedagogy. For example, Leicht et al. (2018) and Rieckmann (2022) demonstrate that competency-based ESD approaches significantly enhance learners' sustainability-related attitudes and behaviors. These findings reinforce the central role of geography as a carrier subject for ESD implementation in school curricula.

2.3. The Relationship between Culture, Environment, and Geography Education

Culture and environment are deeply interrelated dimensions of human life, shaping how societies perceive, value, and manage natural resources. Culture not only reflects national identity but also embodies traditional ecological knowledge, including agricultural practices, water management customs, and spiritual beliefs tied to landscapes (UNESCO 2005). At the same time, environmental issues – such as climate change or biodiversity loss - cannot be

addressed effectively without accounting for cultural contexts and community practices.

Recent research on biocultural diversity highlights the inseparable link between cultural practices and ecosystem sustainability (Sterling et al. 2017; Caillon et al. 2022). These studies show that indigenous knowledge systems play a critical role in biodiversity conservation and climate adaptation, particularly in developing countries.

Geography provides a unique platform for integrating cultural and environmental perspectives. Lessons on physical geography can be enriched by discussing indigenous adaptation strategies, local agricultural systems, or heritage-based conservation practices. Conversely, cultural topics such as festivals or settlement patterns gain depth when linked to environmental conditions. Integrating culture and environment in geography classrooms, therefore, serves multiple purposes: deepening subject knowledge, fostering place-based identity, strengthening heritage preservation, and promoting community-based sustainable development (Bowers 2004; Walshe 2017).

Recent place-based education studies further support this approach. A systematic review by Stoltenberg and Lattanzio (2023) indicates that linking classroom learning with local cultural and environmental contexts significantly improves students' sustainability awareness and civic engagement. Similarly, He et al. (2022) demonstrate that place-based geography education in China and the USA enhances learners' sense of responsibility toward local environments.

2.4. Research Design

To examine perceptions and practices of integrating cultural and environmental dimensions in geography education, the

research employed a mixed-method survey design. Two respondent groups were involved: (i) 186 upper secondary geography teachers nationwide and (ii) 326 students from selected high schools across different regions of Vietnam.

Teachers were selected using convenience and regional stratified sampling to ensure representation from northern, central, and southern provinces. Students were drawn from urban and rural schools to capture diverse learning contexts.

The teacher questionnaire comprised three sections: (i) demographic information, (ii) Likert-scale items measuring awareness, skills, attitudes, and evaluations of integrated teaching, and (iii) open-ended questions on challenges and proposed solutions. The student questionnaire focused on perceptions of integrated lessons, learning engagement, and connections to local contexts. All closed-ended items were measured on a five-point Likert scale (1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree).

Questionnaire items were developed based on previous ESD and curriculum integration studies (Rieckmann 2022; Kidman and Chang 2023) and reviewed by three experts in geography education to ensure content validity. A pilot survey with 25 teachers was conducted, leading to minor revisions of the survey for clarity.

Data were collected through both online and in-person surveys during March-April 2025. Quantitative responses were analysed using descriptive statistics (percentages, means), internal reliability was tested using Cronbach's alpha, yielding values of 0.87 (teachers) and 0.84 (students), indicating high reliability. Qualitative responses were thematically coded to identify common challenges and suggested strategies.

This research design ensured both breadth (through quantitative data) and depth (through qualitative insights), thereby providing a robust foundation for analysing the feasibility and potential of integrating culture and environment in geography education.

3. Current Status of Integrating Culture and Environment in Upper Secondary Geography Education

3.1. Analysis of the 2018 General Education Geography Curriculum

Vietnam's 2018 General Education Geography Curriculum is competency-based, emphasizing practical application, interdisciplinary connections, and the cultivation of responsible global citizenship. According to the Ministry of Education and Training (2018: 12) the subject aims to "understand and apply geographical knowledge and skills to perceive the surrounding world, analyse and evaluate geographical phenomena, and take responsibility for the community, the nation, and humanity, with a focus on sustainable development." This framework provides a strong foundation for integrating cultural and environmental dimensions into geography education, consistent with the principles of ESD.

At the upper-secondary level, the Geography curriculum is organized into two main components: (i) core knowledge, which provides fundamental concepts and skills, and (ii) thematic topics, which allow deeper exploration, interdisciplinary linkages, and contextualized applications. This structure creates explicit opportunities for teachers to design integrated lessons that connect geographical knowledge with local cultural and environmental issues.

These topics and themes (see Table 1) illustrate how national curriculum content can be localized to reflect Vietnam’s diverse cultural landscapes and environmental

contexts. They also align with recent place-based education approaches that emphasize learning rooted in local realities (Stoltenberg and Lattanzio 2023).

Table 1: Potential for Cultural and Environmental Integration in the Upper Secondary Geography Curriculum

Topic (as in Curriculum)	Grade	Contextualized Teaching Theme	Integration Potential
Humans and Nature	10	Indigenous knowledge in land use and forest protection in the Northwest	Combining ecological knowledge, spiritual beliefs, and agricultural practices with environmental conservation
Geography of Economic Sectors	10	Sustainable tourism development in Ha Long Bay (Quang Ninh)	Linking heritage preservation with economic growth and environmental protection
World Socio-Economic Geography	11	Urbanization and sustainable development challenges in Ho Chi Minh City (with international comparison)	Examining environmental and cultural impacts of urbanization in both local and global contexts
Regional Development	12	Community-based tourism and cultural heritage preservation in the Central Highlands	Integrating cultural heritage, community livelihoods, and ecological sustainability in regional planning

In Grade 10, students are introduced to integrated content linking physical, human, and economic geography. The topics *Humans and Nature* and *Geography of Economic Sectors* provide opportunities for addressing both environmental issues and cultural practices. For example, the theme “Indigenous knowledge in land use and forest protection in the Northwest” highlights traditional ecological knowledge and its role in environmental conservation. In contrast, the theme “Sustainable tourism development in Ha Long Bay (Quang Ninh)” demonstrates the integration of cultural heritage preservation and environmental protection in economic activities.

In Grade 11, the focus shifts to *World Socio-Economic Geography*, which examines global patterns of economic and social development. Within this framework,

the theme “Urbanization and sustainable development challenges in Ho Chi Minh City (with international comparison)” offers a basis for integrating cultural and environmental perspectives into global studies, illustrating how rapid urbanization impacts both ecological systems and cultural life.

In Grade 12, the central topic, *Regional Development*, emphasizes the interplay between economic growth, cultural identity, and environmental sustainability across Vietnam’s regions. The theme “Community-based tourism and cultural heritage preservation in the Central Highlands” exemplifies this integration, showing how economic strategies can simultaneously foster ecological protection and strengthen local cultural identity.

As illustrated in Table 1, the curriculum creates multiple entry points for integrating

cultural and environmental content across grades. These localized teaching themes not only enrich geographical knowledge but also cultivate students' critical thinking, problem-solving, and civic responsibility. However, despite these curricular opportunities, the extent to which such integration occurs in classroom practice remains unclear, necessitating empirical investigation.

3.2. Teacher Perceptions and Practices in Integrated Geography Instruction

This section presents the survey findings on teachers' and students' perceptions and practices regarding the integration of cultural and environmental content in

geography education. Results are organized into two groups: teachers (N = 186) and students (N = 326).

3.2.1. Teacher Perceptions and Practices (N = 186)

Teachers expressed strong recognition of the value of integration in geography instruction. As shown in Table 2, most agreed that integration is necessary (TA1, M (mean)=4.14), enhances learning outcomes (TA2, M = 4.20), and contributes to sustainable development goals (TA3, M = 4.04). These findings suggest a high level of conceptual acceptance of interdisciplinary teaching among Vietnamese geography teachers.

Table 2: Teachers' General Evaluation of Integrated Teaching (N = 186), unit: %.

Item	Statement	1	2	3	4	5	Mean
TA1	Integrated teaching is necessary in geography	1	3	12	49	35	4.14
TA2	Integration improves student learning outcomes	0	4	10	48	38	4.20
TA3	Integration supports sustainable development goals	2	5	13	47	33	4.04

Regarding teaching skills (Table 3), teachers rated their ability to design environmental learning activities highest (TB2, M = 4.08), while the assessment of sustainability-related outcomes was rated lowest (TB4, M = 3.72). This result indicates that although teachers are confident in designing activities, they face difficulties in evaluating students' sustainability competencies, a challenge also reported in international ESD studies (Rieckmann 2022).

Table 3: Teachers' Skills for Integrating Culture and Environment (N = 186), unit: %.

Item	Statement	1	2	3	4	5	Mean
TB1	Ability to select culturally relevant content	2	6	15	50	27	3.94
TB2	Ability to design activities linked to environmental protection	1	5	12	49	33	4.08
TB3	Skills in using technology to illustrate cultural/environmental content	3	9	16	45	27	3.84
TB4	Ability to assess learning outcomes related to sustainability	4	10	18	46	22	3.72

As for attitudes and behaviours (Table 4), teachers were most committed to encouraging student participation in cultural and environmental activities (TC2, M = 4.25). However, participation in community programs (TC4, M = 3.80) was lower, suggesting limited school-community linkage in current practice.

Table 4: Teachers’ Attitudes and Behaviours Toward Integrated Teaching (N = 186), unit: %.

Item	Statement	1	2	3	4	5	Mean
TC1	Always willing to integrate cultural/environmental content	1	4	10	50	35	4.14
TC2	Encourages students in environmental protection and cultural exploration	0	3	9	48	40	4.25
TC3	Regularly updates materials on culture/environment	2	6	15	47	30	3.97
TC4	Participates in community programs on sustainability	4	8	18	44	26	3.80

Finally, teacher evaluations of effectiveness and feasibility (Table 5) showed that integration was highly valued for fostering cultural and environmental attitudes (TD3, M = 4.24), while feasibility in practice (TD4, M = 3.74) remained the most challenging aspect. This gap between perceived value and practical feasibility reflects structural constraints such as time allocation, teaching load, and limited institutional support.

Table 5: Teacher Evaluation of Effectiveness and Feasibility (N = 186), unit: %.

Item	Statement	1	2	3	4	5	Mean
TD1	Integration increases student engagement	1	4	12	52	31	4.08
TD2	Integrated content deepens geographical knowledge	0	3	11	54	32	4.15
TD3	Integration fosters positive cultural/environmental attitudes	0	2	10	50	38	4.24
TD4	Integrated teaching is feasible in current practice	3	9	21	45	22	3.74

3.2.2. Student Perceptions and Practices (N = 326)

Students generally demonstrated positive perceptions of integrated geography lessons. As shown in Table 6, they strongly agreed that integration makes geography more engaging (SA1, M = 4.08), helps them connect knowledge to local realities (SA2, M = 4.02), and deepens their understanding of sustainable development (SA3, M = 4.10). However, the frequency of integrated examples provided by teachers was rated lowest (SA4, M = 3.22). This indicates that although students value integrated learning, they perceive its classroom implementation as still limited.

Table 6: Students’ Perceptions of Integrated Teaching (N = 326), unit: %.

Item	Statement	1	2	3	4	5	Mean
SA1	Integrated lessons make geography more engaging	2.5	5.5	10.5	45.0	36.5	4.08
SA2	I can connect knowledge with local culture/environment	3.0	6.0	12.0	44.0	35.0	4.02
SA3	Integration helps me understand sustainable development	2.2	5.5	11.0	43.0	38.3	4.10
SA4	Teachers often provide cultural/environmental examples	11.0	20.0	23.0	28.0	18.0	3.22

The qualitative findings offer further support for this position. For example, one student commented that: “When teachers use local examples, I understand geography better and feel more connected to my community” (Student 112, Dak Lak).

These results suggest that students are receptive to integrated instruction and recognize its educational benefits. Nonetheless, the gap between students’ expectations and teachers’ actual classroom practices highlights the need for stronger implementation and pedagogical support.

4. Designing an Educational Space and Pedagogical Process for Integrating Culture and Environment in Geography Education

4.1. Educational Space Model for Sustainable Development-Oriented Geography

The sustainable development-oriented geography educational space is a model of integrated teaching that connects geographical knowledge with cultural and environmental domains to foster sustainable thinking and action among students. In this model, geographical knowledge – covering natural systems, society, and population – is closely linked with cultural elements (heritage, festivals, lifestyles) and environmental aspects (natural systems, pollution, climate change). Such integration enables students to develop not only domain-specific knowledge but also an understanding of the interdependence between these elements in addressing real-world problems.

Survey results indicate strong support for this integrated orientation. Specifically, 84.3% of teachers agreed that linking geographical content with local culture increases student engagement (Table 5, TD1), while 79.6% believed it helps students better understand environmental issues in their own communities. For example, one teacher stated that: “When I connect lessons on regional development with local festivals and livelihood practices, students participate more actively and relate the content to their own lives” (Teacher 27, Quang Nam).

Implemented within the framework of Vietnam’s 2018 General Education Curriculum, the model organizes teaching around real-world, locally relevant topics, thereby cultivating both competencies and character qualities. The integrated content

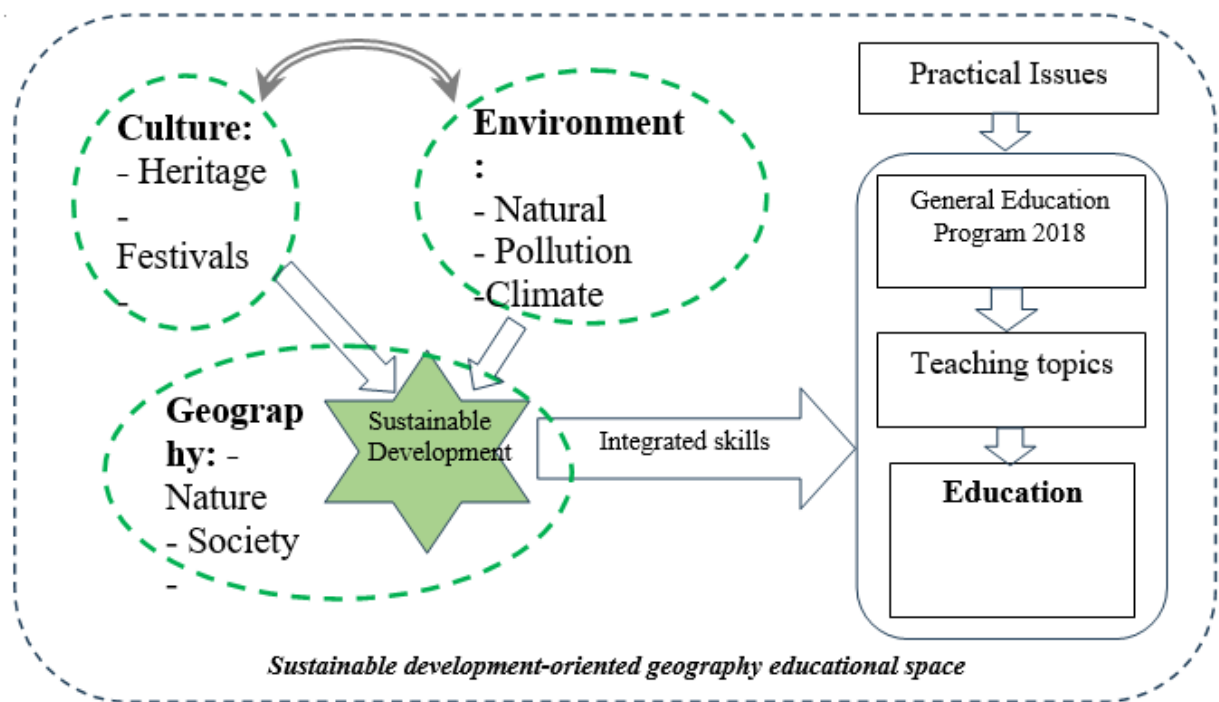
aims to address sustainable development challenges, enhancing students’ environmental awareness, cultural identity preservation, and capacity for rational resource use. This model is intentionally open and flexible, enabling teachers to design creative learning experiences that strengthen the connection between schools and their surrounding communities.

This flexibility responds directly to teachers’ reported needs for adaptable teaching models. According to the survey, 72.5% of teachers indicated that rigid lesson structures limit their ability to integrate interdisciplinary content effectively.

Figure 1 below presents a conceptual map of the interdisciplinary integration of culture and environment in upper secondary geography instruction, illustrating the multidimensional relationships between knowledge domains within the current educational reform context. The figure underscores the central role of thematic teaching as a bridge between interdisciplinary knowledge and practical application, framed within the goals of sustainable development. This structured integration promotes interdisciplinary competence, expanded perspectives, and a heightened sense of civic responsibility toward culture and the environment.

Students’ responses further confirm the value of this model. Over three-quarters (78.2%) of students reported that lessons using local cultural and environmental examples helped them understand geography more deeply (Table 6, SA2). For example, one student commented that: “Learning about tourism in Ha Long Bay made me realise how culture and environment are connected. It also made me think about protecting my local environment” (Student 89, Quang Ninh).

Figure 1: Conceptual framework for interdisciplinary integration of culture and environment in upper secondary geography education

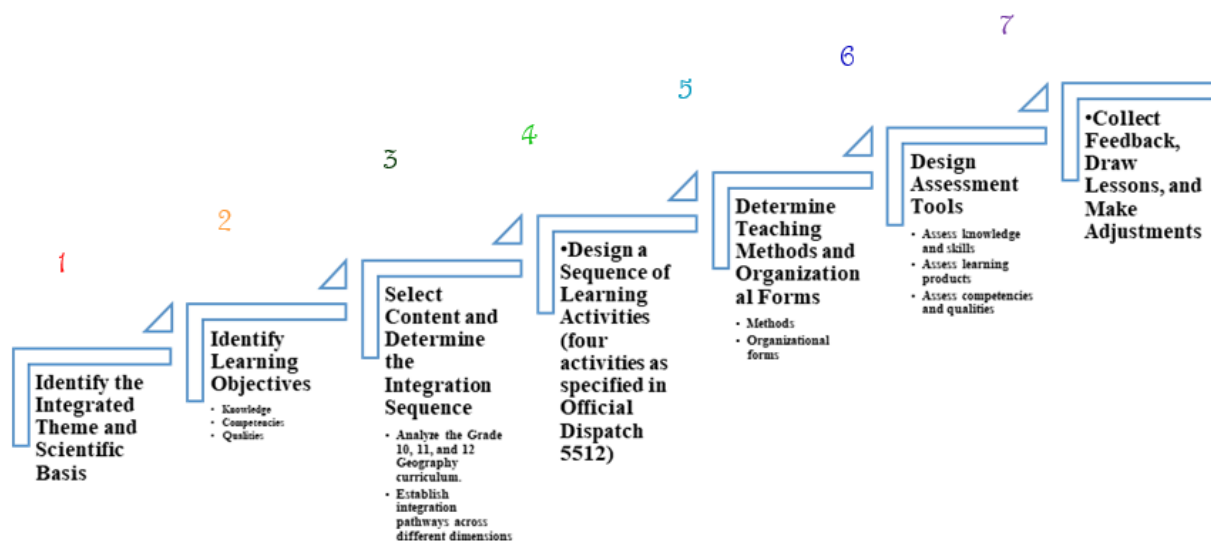


Recent scholarship also underscores the value of place-based education in linking classroom learning with local culture and environment. A systematic review by Stoltenberg and Lattanzio (2023) shows that such approaches enhance students' awareness, attitudes, and behaviours regarding sustainability. This evidence supports the use of localized themes in Vietnamese geography education, making integration both pedagogically sound and internationally relevant.

4.2. Pedagogical Process for Designing Integrated Lesson Plans

The integration of cultural and environmental dimensions into geography

education requires a systematic pedagogical process rather than incidental inclusion. To address this, a seven-step process has been designed, drawing from competency-based pedagogy and principles of ESD. This process provides a clear framework for teachers to plan, deliver, and assess lessons in ways that connect geographical knowledge with local cultural practices and environmental sustainability (see Figure 2). The structure of this process is grounded in empirical findings from the teacher survey. For example, teachers' relatively lower confidence in assessment (TB4, M = 3.72) directly informed the explicit inclusion of Step 6 (which focuses on assessing student learning).

Figure 2: The seven-step pedagogical process for integrating culture and environment in geography education

The seven steps are explained as follows:

Step 1. Identifying the integrated theme and scientific basis. Teachers begin by defining the overarching integrated theme and its scientific foundation, ensuring alignment with geographical knowledge and relevant cultural and environmental dimensions. This step establishes the conceptual coherence of the lesson and ensures that integration is grounded in disciplinary knowledge rather than superficial connections.

Step 2. Identifying learning objectives. Teachers define cognitive, skill-based, and attitudinal goals that combine geographical competencies with cultural awareness and environmental responsibility. This step responds to teachers' strong recognition of the importance of integration (TA1, M = 4.14). As one teacher noted: "Clear objectives help me balance knowledge goals with attitudes toward environmental protection" (Teacher 41, Hanoi).

Step 3. Selecting content and determining the integration sequence.

Appropriate knowledge units and themes are chosen from the official curriculum, emphasising entry points where cultural and environmental aspects naturally intersect (e.g., Humans and Nature, Regional Development). Survey data show that 81.7% of teachers prefer using curriculum-based themes rather than adding external content, ensuring alignment with official learning standards.

Step 4. Designing a sequence of learning activities. Activities are planned to highlight real-world connections, such as analysing local case studies of forest conservation, cultural festivals, or sustainable tourism. This aligns with teachers' highest-rated skill (TB2, M = 4.08). As one teacher noted: "Project work on local tourism helps students see how geography relates to their community" (Teacher 63, Lam Dong).

Step 5. Determining teaching methods and organisational forms. Teachers select appropriate pedagogical approaches, including inquiry-based learning, project-based learning, and experiential activities,

along with suitable classroom organisational forms. These strategies foster active engagement and interdisciplinary thinking. Notably, 68.4% of students reported that group-based activities increased their interest in geography lessons (SA1). As one student commented: “Working in groups to study local festivals helped me understand culture better than reading textbooks” (Student 205, Hue).

Step 6. Designing assessment tools. Assessment strategies are developed to evaluate not only knowledge acquisition but also skills and competencies related to sustainability. These include both traditional assessments and performance-based tasks such as project reports or community proposals. This step directly addresses teachers’ reported difficulty in assessing sustainability outcomes (TB4, M = 3.72). As one teacher noted: “I need clearer criteria to evaluate students’ environmental responsibility, not just their knowledge” (Teacher 78, Bac Giang).

Step 7. Collecting feedback, reflecting, and adjusting. Teachers and students collaboratively reflect on the learning process and outcomes, using feedback to refine future instruction. Reflection plays a critical role in improving teaching effectiveness, with 76.1% of teachers acknowledging its importance (TC3). As one student shared: “After each project, our teacher asks what we learned and what we can improve. It helps me learn better” (Student 311, Can Tho).

This process ensures that integration is intentional, systematic, and aligned with curricular goals. By following these steps, geography teachers can transform lessons into meaningful learning experiences that connect culture, environment, and

sustainability, thereby fostering students’ competencies as responsible citizens.

Importantly, the seven-step process is not a fixed formula but a flexible framework that can be adapted to different school contexts across Vietnam, including rural, mountainous, and urban areas. This adaptability responds to teachers’ diverse working conditions and resource availability, enhancing the model’s practical feasibility.

5. Interdisciplinary Solutions for Integrating Culture and Environment in Sustainable Development-Oriented Geography Education

The proposed solutions focus on strengthening the linkage between geographical knowledge and cultural-environmental dimensions, aiming to cultivate in students systems thinking, practical problem-solving abilities, and a sense of responsibility for sustainable development. Integration must go beyond the superficial embedding of content; instead, it should be organized into interdisciplinary learning themes that explicitly demonstrate the relationship between cultural heritage, festivals, lifestyles, and pressing environmental issues such as pollution, climate change, and resource management.

Survey results strongly support this orientation. A majority (82.6%) of teachers agreed that interdisciplinary themes help students to understand sustainability more holistically (TA3). Students also reported higher engagement when lessons were connected to local realities (SA1, M = 4.08). Taking the above findings into account, key solutions to the issue of integration include:

Professional development for teachers:	<p>Implementing targeted training programs to enhance teachers' interdisciplinary integration skills, focusing on curriculum design, thematic planning, and the use of active learning methods. This recommendation is directly derived from teachers' self-reported challenges. Although teachers showed positive attitudes toward integration, 64.2% indicated that they lack formal training in interdisciplinary lesson design. For instance, one teacher commented that: "I understand the importance of integration, but I need more professional training on how to design interdisciplinary lessons effectively" (Teacher 52, Thanh Hoa).</p> <p>Therefore, in-service training programmes should prioritize: designing integrated lesson plans, developing sustainability-oriented assessments, and using ICT and digital resources to support cultural and environmental learning.</p> <p>Such training should be embedded in regular professional development cycles rather than in one-off workshops.</p>
Development of digital learning resources:	<p>Building a national open-access repository of teaching materials, including digital media, lesson plans, and case studies, in order to support teachers in designing and delivering integrated lessons effectively.</p> <p>This solution responds to teachers' reported lack of teaching materials. Almost three-quarters (71.3%) of teachers stated that they do not have sufficient resources for integrated teaching. A teacher explained: "If there were a shared database of local case studies, it would save time and improve lesson quality" (Teacher 19, Nghe An).</p> <p>Students also expressed a preference for digital learning materials. "Videos and interactive maps make geography lessons more interesting" (Student 147, Hai Phong).</p> <p>Developing a national open-access digital repository would therefore not only support teachers but also align with Vietnam's digital transformation agenda in education.</p>
Time allocation for interdisciplinary activities:	<p>Allocating sufficient instructional time within the timetable to ensure integrated topics are implemented with depth, rather than as brief add-ons to existing lessons.</p> <p>Time constraints emerged as a major barrier. 58.7% of teachers reported that limited teaching time prevents them from implementing integrated projects effectively. One teacher stated: "Integrated projects need more time, but the current timetable is very tight" (Teacher 33, Binh Dinh). Educational administrators should therefore consider flexible scheduling models, such as project weeks, cross-subject modules, and extracurricular thematic days.</p> <p>These measures would enable deeper interdisciplinary learning.</p>
Experiential and community-based learning:	<p>Organizing extracurricular and experiential learning activities connected to local cultural and environmental contexts, enabling students to apply classroom knowledge to real-world situations.</p> <p>This solution is strongly supported by student responses. A majority (84.1%) of students expressed a desire for more field-based learning activities. A student shared: "Field trips help me understand how people protect forests and cultural heritage in my community" (Student 276, Gia Lai).</p> <p>Such activities may include visits to heritage sites, participation in local environmental campaigns, and interviews with community members.</p> <p>These experiences enhance place-based identity and civic responsibility.</p>
Strengthened school-community partnerships:	<p>Fostering collaboration between schools, local governments, social organizations, and communities to create a supportive network for integrated teaching, providing access to expertise, sites, and resources.</p> <p>Teachers emphasized the importance of external support. "We need cooperation from local authorities and communities to organise meaningful fieldwork" (Teacher 7, Lao Cai).</p> <p>Survey data show that schools with strong community partnerships reported higher feasibility scores (TD4). Formalizing school-community partnerships through memoranda of understanding (MoUs) would help secure access to local resources, invite</p>

guest speakers, and organize joint environmental projects.

By applying these measures, geography lessons become more dynamic, relevant, and impactful, while simultaneously building students' cognitive, affective, and behavioural competencies to engage in cultural preservation, environmental protection, and sustainable development initiatives.

These solutions also resonate with international trends in geography education reform. According to Wilmot and Bednarz (2025), geography education is shifting from traditional content transmission toward transformative learning environments. The Vietnamese case demonstrates how such transformation can be operationalized through concrete curricular structures and pedagogical strategies.

From this perspective, integrating cultural and environmental dimensions is more than a curricular adjustment. It represents a strategic move to position geography as a transformative subject that cultivates global citizenship, social responsibility, and sustainable action. Thus, this study contributes a context-specific yet internationally relevant model for sustainable development-oriented geography education.

6. Conclusion

Integrating cultural and environmental content into upper secondary geography education in alignment with sustainable development principles not only enriches instructional content and methodology but also fulfils the objectives of Vietnam's 2018 General Education Curriculum, which seeks to develop students' competencies and character holistically. The findings of this research confirm that most teachers and students in Vietnam hold positive

perceptions toward integrated geography instruction. Teachers reported that integrated activities enhance student engagement, deepen geographical understanding, and foster positive attitudes toward culture and the environment. Students similarly emphasized that localized examples help them better connect geographical knowledge with their own communities.

Nonetheless, significant challenges remain, including constraints in instructional time, a lack of ready-to-use teaching materials, limited ICT skills, and insufficient coordination among educational stakeholders. These barriers explain the gap between teachers' strong conceptual support for integration and their relatively lower confidence in practical implementation. To address these challenges, a comprehensive approach is required: enhancing teachers' interdisciplinary teaching capacity, creating shared digital resource repositories, allocating appropriate time for integrated topics, organizing experiential activities rooted in local contexts, and strengthening collaboration between schools and communities. These recommendations are grounded directly in empirical evidence from the teacher and student surveys presented in this study.

From a theoretical perspective, this research contributes to the literature on ESD and integrated curriculum by operationalizing these frameworks within the specific context of Vietnam's upper secondary geography curriculum. Unlike previous studies that remain largely conceptual, this study identifies concrete curricular entry points and proposes a data-informed pedagogical model and seven-step implementation process. Practically, the study provides a feasible framework that geography teachers can adapt to different school contexts, including urban, rural, and

mountainous areas in Vietnam. This adaptability enhances the model's relevance and scalability across diverse educational settings. At the policy level, the findings offer evidence-based insights for curriculum developers and educational administrators seeking to strengthen the implementation of the 2018 General Education Curriculum. Supporting interdisciplinary teaching through professional development, resource provision, and institutional coordination is essential for translating curriculum reform into classroom practice.

Ultimately, the integration of culture and environment into geography instruction does more than enrich the subject – it cultivates in students the awareness, skills, and values necessary to become responsible global citizens, equipped to contribute meaningfully to a sustainable future. By grounding global educational orientations in local Vietnamese realities, this study highlights the transformative potential of geography education in advancing sustainable development.

Declaration of AI Use

During the preparation of this manuscript, the authors utilized the artificial intelligence tool ChatGPT to assist with suggesting the article structure, academic phrasing, and language editing. The authors remain fully responsible for the content, accuracy, and academic integrity of the paper.

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