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Enhancing Enjoyable Learning in Geography Education through Field Trips to Wetland Ecosystems: A Mixed-Method Study

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Abstract

Background/purpose. Students' emotional condition plays a crucial role in forming enjoyable learning in geography. One way to modify students' emotions is through field trips to sites with diverse geographical aspects. This study aims to identify potential wetland field trip locations for geography learning in higher education and assess students' enjoyable learning through field trips at these locations.

Materials/methods. This research uses a mixed-method sequential explanatory design approach. The first stage collects quantitative data, including the geographical aspect scores of four wetland locations in South Sumatra, Indonesia, and the enjoyable learning scores of 35 students during their field trips. The second stage gathers qualitative data through student interviews to explore emotional conditions based on participation during the field trip. Instruments used are observation sheets to assess the potential of the field trip location and the Achievement Emotions Questionnaire-short version (AEQ-S) to assess students' enjoyable learning.

Results. The results show that based on observations, three locations have high potential in physical geography, while one location has high potential in human geography. AEQ-S scores show the dominance of positive emotions, with an average score of 81, reflecting a high level of enjoyable learning. Interviews reveal that active students felt happier and prouder, while passive students experienced anxiety about their lack of participation in field trips.

Conclusion. Field trips to wetland ecosystems have been proven to enhance learning and contribute to positive emotional experiences. These findings suggest that they should be incorporated into university geography curricula, especially in areas with similar ecosystems.

1. Introduction

Geography is not just about studying maps; it involves a deep understanding of the dynamics of the world around us. Geography studies nature and humans and their interactions, focusing on space, location, region, and the patterns they produce (Meadows, 2020). Meanwhile, the basic knowledge of geography education is studies of the role of map and globe skills, spatial ability in geographical understanding, literacy skills, environment, and understanding of the process of learning geography (Sarah W. Bednarz et al., 2004). In the context of higher education, effective geography learning encourages students to engage directly with natural phenomena through field exploration. This approach is important for building a holistic and critical understanding of the interaction between the environment and society (Demirci Güler & Afacan, 2013; Foo & Foo, 2022).

As a continuation of this understanding, through interaction with the real world, students not only obtain learning materials based on real-world contexts but also hone their abilities to understand various natural phenomena from spatial and regional aspects (Anđelković et al., 2018; Arinta et al., 2016; Holgersen, 2021; Seran et al., 2020), develop essential observation and perception skills towards the world around them (Meadows, 2020; Rakuasa & Latue, 2023; THOMAS, 2019), and also create enjoyable learning conditions (Bratman et al., 2015; Hakokõngäs & Puhakka, 2023; Puhakka, 2021). Geography learning cannot be optimized without field activities, just as science loses its essence without experiments. Deepening concepts such as geology and geomorphology requires hands-on learning that cannot be achieved through classroom theory alone (de la Vega, 2022; Demirkaya & Atayeter, 2011; DeWitt & Storksdieck, 2008; Evelpidou et al., 2022; Krakowka, 2012). Therefore, implementing field-based learning that prioritizes practical experiences such as field trips is crucial to achieving effective geography education goals.

Field trips allow students to observe and explore geographical phenomena directly in the field (Anđelković et al., 2017; Krahenbuhl, 2014). Utilizing all their senses supports more meaningful learning (Abraham & von Brömssen, 2018; Herrick, 2010; Klein, 2003). In addition to being relevant for students in elementary and secondary schools, field trips also play an important role in higher education (Faizi & Hafeez, 2011; Larsen et al., 2017) because they develop a better understanding of geography and increase intrinsic motivation in relationships with peers and lecturers, about the environment, materials, and what is challenging to get in class (Fuller, 2006; Leydon & Turner, 2013). Field trips also inform the public that learning geography is fun because of direct interaction with nature (Gaillard & McSherry, 2014; Ilovan et al., 2019).

Geography field trip locations offer a variety of choices, including campus environments, city centers, parks, and other areas depending on the student's grade level (Leydon & Turner, 2013; Sumarmi, 2012). Previous studies have explored different landscapes ranging from a constructed wetland in Texas City (Hoover, 2021), hunting for disaster signs di Auckland (Gaillard & McSherry, 2014), a forest in Germany (Schneiderhan-Opel & Bogner, 2021), a reservoir in Virginia (Ambers, 2005), geological sites in Indonesia (Oktavianto et al., 2021), karst in Rwanda (Nsengimana et al., 2017), settlements and cities in Sweden and Latvia (Boeve-de Pauw et al., 2019; Grinfelde & Veliverronena, 2021), a Human Geography Fieldtrip in Scotland (Hope, 2009), and field trips to study environmental issues in South Africa and UK (Cotton, 2010; Fletcher et al., 2007). These locations improve students' understanding by allowing direct interaction with geographic phenomena. However, attention to wetlands as a resource for geographic learning is still limited, so increasing focus on this topic could enrich the curriculum and awareness of the global importance of these ecosystems.

Wetland ecosystems are important resources worldwide, including in tropical regions such as Indonesia, which face degradation threats due to climate change and land conversion. One of the provinces in Indonesia, South Sumatra has an area with a rich wetland ecosystem, including peat swamps and mangrove forests that grow along the eastern coast (M.Fadhlan S.Intan, 2017) with an area of 1.48 million ha or 20.6% of the area (Wahyunto et al., 2005). Wetlands offer unique opportunities for geography learning because of their complex and diverse characteristics, covering aspects of physical geography (geomorphology, hydrology, and biodiversity) and aspects of human geography (socio-economic and cultural interactions) (Calhoun et al., 2003; Schön et al., 2022; Schutz & Pekrun, 2007). Directly interacting with natural processes can deepen students' understanding of environmental desires and help them build positive emotional interactions, making learning more enjoyable (Hails, 2018; Junk et al., 2013).

The proper implementation of field trips can strongly impact students' emotional experiences and create enjoyable learning (Behrendt & Franklin, 2014; Das & Chatterjea, 2018; Singh-Corresponding, 2014; Yigitcanlar, 2013). Content engagement, effective instructors, active learning, and learning achievement contribute to these experiences (Seemiller et al., 2021). Field trips in wetlands meet these factors by providing students with direct access to observe authentic geographic phenomena, which can enhance critical thinking, motivation, and innovation in exploring ideas (Dabamona & Cater, 2019; Kashdan et al., 2004; Litman, 2005). Enjoyable learning can potentially improve student learning outcomes, improving the overall quality of the education process (Masino & Niño-Zarazúa, 2016; Muis et al., 2016).

Based on this, geography field trips to wetlands can improve students' educational experiences and enhance their awareness of the interactions between humans and nature. Although the use of wetlands in geography education is still limited, this approach can provide important insights into vital ecosystems. Therefore, researchers and educators must develop a field-based learning curriculum in wetlands to create a generation sensitive to global environmental issues and contribute positively to natural resource conservation.

2. Literature Review

2.1. Geography and Its Learning

Geography has the advantage of developing a more holistic understanding of global environmental challenges because it encompasses all sciences (including social and humanities) (Meadows, 2020). Three approaches characteristic of geography, namely spatial, environmental, and regional complex (Aksa et al., 2019), can help understand the interaction between humans and the environment in more depth. Along with technological developments and changes in the landscape, geography as a discipline can continue to survive and provide benefits (Erickson, 2012).

Geographical competence involves cognitive aspects, including formulating problems, identifying answers, and providing solutions using geospatial concepts, representation tools, and reasoning processes (Cutter et al., 2002; de la Vega, 2022). On the other hand, in geography learning, students must actively observe and understand the processes and phenomena that occur in the surrounding environment, which have been important issues in geography teaching (Piotrowska et al., 2019). Therefore, fieldwork is an essential and influential aspect of geography education in higher education (Fedesco et al., 2020; France & Haigh, 2018). Through fieldwork, students can plan routes, survey geographic aspects, collect data samples, and analyze observations closely related to spatial location information (Ruan et al., 2021).

2.2. Field Trip

Field trip is defined as a student experience that occurs outside the classroom, taking place in an interactive location specifically designed for educational purposes (Herwegh et al., 2008; Hoover, 2021; Kent et al., 1997; Krakowka, 2012; Mogk & Goodwin, 2012). Field trips outside the area aim to expand or compare geosphere phenomena from one region to another. Field Trips can stimulate new learning, improve attitudes toward science, trigger development interests, and provide many rewards for teachers and students (Ballantyne & Packer, 2002; Scarce, 1997; Stirling, 2008).

Field trips in higher education have a role in helping students get to know, study, identify, and apply all knowledge, attitudes, and skills related to the discipline of geography (Marvell & Simm, 2018; Phillips, 2015). This is also confirmed by several studies that argue that successful field trips integrate physical and human geography theories (Hoalst-Pullen & Gatrell, 2011; Peace et al., 2021). Peter Haget stated that Orthodox Geography is divided into Philosophy of Geography, Systematic Geography, Regional Geography and Engineering Geography. The selection of the field trip location refers to systematic geography, which divides geography into physical and human aspects. Physical aspects include Geology, Geomorphology, Soil Science, Meteorology, Climatology, Oceanography or Oceanology, and Biogeography. Human aspects include economic geography, population geography, political geography, settlement geography, and social geography (Hermawan, 2005).

2.3. Wetland

Wetlands are areas with water surfaces near or above the ground that appear seasonally or permanently throughout the year (Salimi et al., 2021). Wetlands have a role not only as a source of clean water and habitat for living things, but they also function as flood control, prevention of seawater intrusion, protection against erosion, pollution reduction, and global climate regulator (Allouche et al., 2022; Hardjoamidjojo & Setiawan, 2001; Jiang & Xu, 2019; Simpson & Newsome, 2017; Suziana, 2017). Its chemical character is acidic, causing its management to be limited, so it must be managed appropriately to be more productive. Wetland management usually aims to preserve or restore desired ecological characteristics or functions and must involve the community (Cottet et al., 2013; Malekmohammadi & Rahimi Blouchi, 2014; Nsengimana et al., 2017).

Peatlands and mangrove forests are the geomorphological characteristics of parts of South Sumatra, with an area spread across the eastern part, from Musirawas, Musi Banyuasin, OKI, Muaraenim, and Banyuasin Regencies (Wahyunto et al., 2005). Along with population growth, mangrove forests in South Sumatra have slowly decreased in area due to conversion; some of these forest areas have experienced degradation as a consequence of the conversion of land for coconut and oil palm plantations, aquaculture ponds, agricultural areas, ports, and residential developments (Eddy et al., 2021). This fact is one of the important phenomena for students to understand. In addition to directly observing the character of the area where they live, they must also be sensitive to the dynamics of the environment around them. Students are expected to be aware that environmental changes and damage caused by human factors are factual things that occur in the field (Avila, 2018; He et al., 2020; Newman, 2019).

2.4. Enjoyable Learning

Several publications emphasize the importance of Enjoyment in learning (Lumby, 2011). Enjoyment is defined as the emergence of positive experiences elicited by supportive stimuli. Enjoyment can cause the material received to be remembered longer (Hernik & Jaworska, 2018). Enjoyable learning is a learning approach that emphasizes a fun and motivating learning experience for students. This concept is based on the idea that students who feel happy and emotionally involved in learning tend to understand and remember the material taught more efficiently. Enjoyable learning can be brought to life with humor, games, peer tutor learning, field studies, and other fun activities (Baid & Lambert, 2010; Fuaddi et al., 2020; Hackworth, 2024; Zaragoza & Fraser, 2017).

Enjoyable learning can be measured by AEQ-S (Achievement Emotions Questionnaire-short version), a valid and reliable instrument used to measure students' emotions in academics that researchers in various countries have widely used to measure aspects of students' emotions in three situations, namely Class-related Emotions, Learning-related Emotions, and Test-related Emotions

(Chen et al., 2025; Pekrun et al., 2011). Joining classes, participating in group study sessions, and taking tests and exams are all important steps toward success in university. Each activity has its own role and comes with a unique social vibe. For instance, the joy of learning in a classroom can feel quite different from the sense of challenge and achievement you get after completing an exam. However, both are important parts of the overall learning experience. Some students may feel energized and motivated in the classroom, while others might find their thrill in the challenge and excitement of exams (Pekrun et al., 2005).

3. Methodology

3.1. Research Design

This study integrated quantitative and qualitative data using a mixed-method approach with a sequential explanatory design (Ivankova et al., 2006). This approach was chosen to deeply understand the emotional and learning impacts on students during field trips in wetland ecosystems.

3.2. Research Participant

The study participant comprised 35 third-semester geography education students from South Sumatra and Bangka Belitung Provinces. All participants had taken geomorphology, geology, hydrology, meteorology, climatology, and social geography courses. Ten students were purposively selected as interview respondents based on their involvement in field trip activities.

3.3. Research Sites

The study locations consisted of four sites representing wetland ecosystems in South Sumatra. The sites were selected based on the diversity of physical and social aspects, relevance for geography learning, and accessibility for field activities.

Table 1. Wetland Field Trip Sites

Stop site	Site Description	Observed Phenomena
1 and 2	Site of peatland governance and conservation	Physical geography aspects
3	Mangrove ecosystem	
4	Coastal fishing community	Human geography aspects

3.4.Research Instrument

The quantitative instrument is AEQ-S (Achievement Emotions Questionnaire-short version) developed by Bieleke et al. (2021) with a Likert scale of 1-5 to assess students' emotions related to Class-related Emotion, Learning-related Emotion, and Test-related Emotion. This instrument has been widely used in educational and psychological studies to evaluate the emotional impact on learning experiences in primary academic conditions, with details in Figure 1. The emotional aspects of each academic situation are categorized into positive emotions (Enjoyment, Hope, Pride, relief) and negative emotions (Anger, Anxiety, Shame, Hopelessness, Boredom).

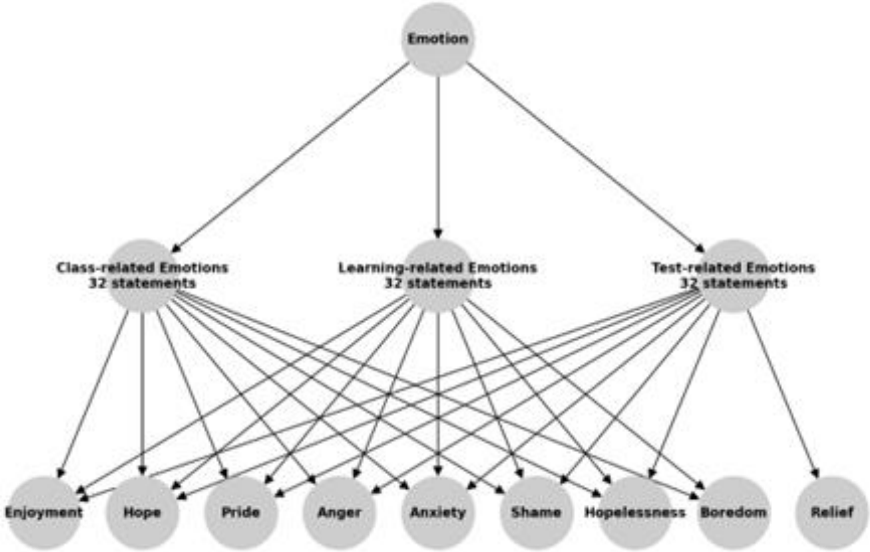

Figure 1. Emotional Structure in Academic Conditions

The qualitative instrument is a semi-structured interview with 10 students who were selected purposively based on their level of participation during the field trip. The interview explored emotional experiences and involvement in field learning (The complete interview questions can be seen in Appendix I).

3.5. Data Collection Procedure

Researchers conducted data collection in two stages. First, students filled out the AEQ-S questionnaire after completing field activities at each location to record their emotional experiences. Second, interviews were conducted within one week after the field activities and analyzed thematically. In addition, quantitative data related to the potential of geographical aspects at the field trip location were collected using observation sheets according to Table 2 before the researcher carried out the field trip.

Table 2. Potential Parameter Indicators at Observation Locations

Aspect	Sub Aspect	Measurement Indicator
Physical	Geomorphology	Slope gradient, landforms, land, Air
	Weather and climate	Temperature, air humidity, rainfall
	Geology	Types of rocks, types of soil, pH of soil
	Hydrology	Salinity, pH of water, drainage basin
	Biogeography	Flora and fauna in the region
	Natural Disaster	Flood, drought, landfire
Human	Social	Language, religion, education, social interaction
	Economy	Economic activities, commodities
	Culture	Life patterns, ethnicity, local traditions
	Tourism	Marine tourism, cultural tourism

Source: (Bambang Syaeful Hadi & Nurhadi, 2014; Geography Education Standards Project (U.S.) et al., 1994; Putra et al., 2022).

3.6. Analyzing of Data

The potential data of the geographical aspects of the four locations were analyzed descriptively using the Weighted Average method which refers to multi-criteria (Hwang & Yoon, 1981) to combine two evaluation aspects, namely the Physical Aspect (S1) and the Human Aspect (S2), into one aggregate value, namely the Total Location Score ($S_{location}$) with the formula:

$$S_{location} = \frac{S1+S2}{2}$$

The classification of scores for each aspect is based on the number of parameters and the score range, as summarized in Table 3.

Table 3. Classification of Geographic Potential Scores

Geography Aspects	Number of Parameters	Scores Range	Class
Physical	6	$22.00 \leq$ Skor ≤ 30.00	High
		$14.00 \leq$ Skor < 22.00	Moderate
		$6.00 \leq$ Skor < 14.00	Low
Human	4	$14.67 \leq$ Skor ≤ 20.00	High
		$9.33 \leq$ Skor < 14.67	Moderate
		$4.00 \leq$ Skor < 9.33	Low

Interview data were analyzed thematically to identify emotional experiences and student engagement patterns during the field trip. The researchers grouped the analysis results to reveal key student interaction and participation themes.

4. Results

4.1. Potential Wetland Field Trip Locations for Geography Learning

The locations chosen as field trip destinations have distinctive physical and human geography aspects that are prominent and essential for geography learning. Other considerations include data collection, accessibility, security, and cost. The results of the potential calculation for the geography aspects at the four locations are presented in Table 4:

Table 4. Potential Location Score as a Wetland Field Trip Destination

Stop site	Physical	Human	Category
Stop site 1	26	N/A	High
Stop site 2	26	N/A	High
Stop site 3	28	N/A	High
Stop site 4	N/A	17	High

The results of the data analysis show that physical aspect observations were carried out at three central locations: Stop Site 1 with a score of 26, Stop Site 2 with a score of 26, and Stop Site 3 with a score of 28. However, physical aspect measurements were not carried out at Stop Site 4. On the contrary, observations at Stop Site 4 focused on human geography aspects with an average score of 17. These results indicate prominent human interactions, especially in the relationship between the socio-cultural aspects of the community and the wetland environment at the location. The difference in observation focus is due to the approach in data collection that is adjusted to the relevance of each location based on the study objectives. This approach provides an in-depth picture of the unique geographical characteristics of each location but also highlights how physical and human aspects complement each other to understand the dynamics that occur in the wetland environment.

These four sites are recommended as field trip destinations for geography learning, especially wetland ecosystems, because of the substantial variation in physical and human geography aspects that allow students to explore the complex interactions between the two. Stop Site 1 and Site 2, with geological characteristics like swamp deposits, are relevant to improving students' understanding of how alluvial soil types and humid tropical climates affect land use for settlements, agriculture, conservation, and the risk of land fires.

Meanwhile, Stop Site 3 and Stop Site 4 have a lower slope of 0 - 2%, so they are utilized as protected forests, secondary mangroves, industrial areas, settlements, and ecotourism. At this location, students gain a deep understanding of the importance of the conservation and management of mangrove ecosystems amidst the pressure of human activities. Furthermore, Stop Site 4 is specifically a fishing settlement located in the coastal area as well as the estuary of the Musi River. In dealing with limited access to clean water due to its location close to the sea, the community applies rainwater harvesting techniques as one of the adaptation strategies. This method allows the community to collect and store rainwater during the rainy season to meet daily needs such as consumption and sanitation. In addition to fishing being the main activity, the community also contributes to developing tourist villages and mangrove cultivation. These activities significantly contribute to the ecosystem's sustainability while supporting the local economy. This illustrates the harmony between local traditions and sustainable environmental conservation efforts.

Through field observations, students can relate physical aspect data to the social dynamics and understand local innovations in overcoming resource challenges. The diversity of these characteristics enriches students' theoretical knowledge and understanding and improves their analytical skills in analyzing sustainable environmental policies. Therefore, all-stop sites are recommended to provide a comprehensive learning experience related to better, more effective, sustainable natural resource management.

4.2. Enjoyable Learning

Table 5 below shows the results of calculating the AEQS questionnaire data for each emotional aspect.

Table 5. Analysis of the AEQ-S Class-related Emotions Questionnaire

Academic Situation	Emotion Aspect	Mean	Academic Interpretation
Class-related Emotions	Enjoyment	89	Students enjoy being outside for field data exploration
	Hope	84,95	Moderate levels of anxiety indicate that students can handle exam pressure
	Pride	87,4	Students take great pride in their achievements
	Anger	35,1	The level of student anger or frustration when learning outside the classroom is very low
	Anxiety	43,97	Student anxiety when learning outside the classroom is at a reasonable and controlled level
	Shame	39,52	Moderate levels of shyness indicate an awareness of being judged by others but are not strong enough to interfere with learning
	Hopelessness	30,82	This tendency is low, indicating that students do not feel discouraged when learning outside of class
	Boredom	35,67	Average boredom levels indicate that students occasionally lose interest in learning in the field, but the overall learning experience remains positive
Learning-related Emotions	Enjoyment	85,52	Students enjoy the challenges of learning activities in the field
	Hope	85,82	Students have a strong confidence in their understanding of the material
	Pride	85,05	Students feel proud of their academic progress
	Anger	33,12	Anger in the learning process is very rare
	Anxiety	46,87	The level of student anxiety towards the task is still within normal limits
	Shame	46,47	Shyness is moderate, reflecting concern about other people's views, but does not significantly interfere with their concentration
	Hopelessness	36,62	Low levels of hopelessness reflect an optimistic attitude despite facing challenges
	Boredom	33,12	Low scores indicate that despite the challenges, students remained engaged in field data observation without feeling too bored
Test-related Emotions	Enjoyment	62,8	Students enjoyed the exam preparation and process
	Hope	75,5	Students have high expectations for their exam results
	Pride	66,47	Students remain proud of their exam results
	Relief	72,7	Students feel relieved after completing the exam
	Anger	35,4	Anger with the exam remains under control
	Anxiety	46,02	Moderate levels of anxiety indicate that students can handle exam pressure
	Shame	49,82	A slightly higher level of shame reflects students' concerns about being assessed in the exam
	Hopelessness	27,9	A low score indicates that students do not feel difficult when facing the exam

Analysis of the academic situation in Class-related Emotions shows the dominance of positive emotional aspects, such as enjoyment with an average value of 89, pride 87.42, and hope 85. These high values indicate that the field trip activity created an in-depth learning experience and increased students' understanding of geography material. These results are based on the literature, which confirms that learning through field trips can encourage more meaningful and enjoyable learning. In addition, the AEQ-S analysis recorded high scores for positive emotions in Learning-related Emotions, including enjoyment (85.87), hope (85.85), and pride (85.15). This data shows that students enjoy the challenges experienced in learning in the field and are proud of their achievements, using field data measuring tools and practical activities such as planting mangrove seedlings in coastal areas. The increased level of self-confidence during this direct learning is one indicator of the success of the field trip as an applicable educational approach.

Students at a controlled level also felt negative emotions. For example, anger (33.18), anxiety (47.12), and shame (46.51) indicate students' concerns about the challenges faced, such as the burden of assignments, weather conditions, fatigue due to long trips, and tests. However, these negative emotions do not interfere with student activities. Low scores on hopelessness (36.66) and boredom (33.18) indicate that although these emotions occasionally appear, students still want to be actively involved in learning. Students responded positively to a relaxed, inclusive learning atmosphere and more open Communication. These factors trigger the exploration of geosphere phenomena in the field to be carried out optimally. This confirms that field visits enrich theoretical understanding and build positive emotional experiences that support the holistic learning process.

Specifically for Test-related Emotions, the positive emotion aspect has a high category score, such as relief (72.72) after completing the post-field trip test. Although there is a sense of shame about the less-than-satisfactory results, this motivates students to increase their efforts and commitment to the seriousness of learning. The high scores on the hope aspect (75.3) and relief reflect that even though students feel burdened by the test, they still have high hopes regarding satisfactory test results and feel relieved after completing it. By understanding this dynamic, strategies are needed to support student emotional management, such as increasing academic readiness and not focusing too much on cognitive values.

One way to analyze the distribution of positive and negative emotions of students in various academic situations is shown in Figure 2, which visualizes the average scores for each emotion aspect:

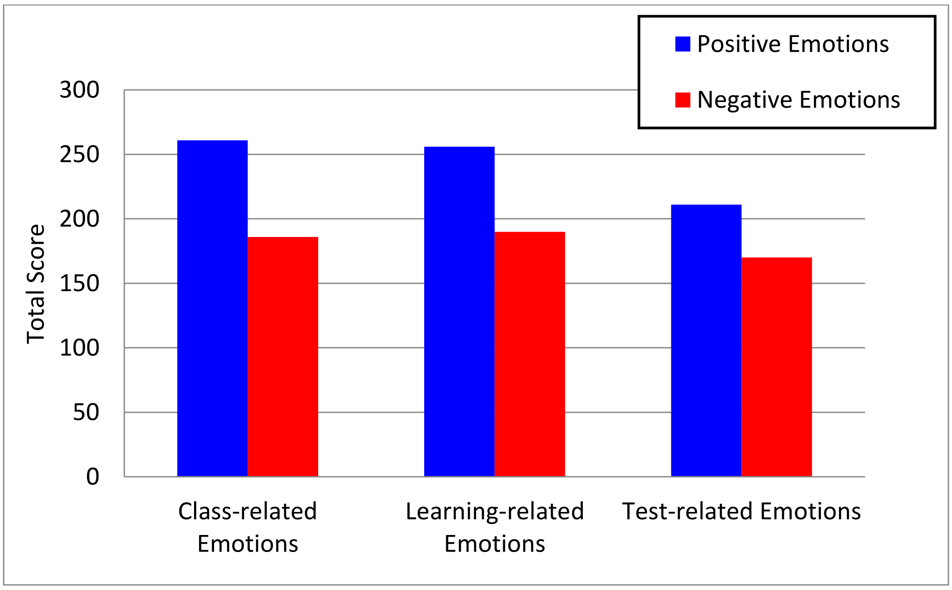

Figure 2. Distribution of Positive and Negative Emotions Across Academic Conditions

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Positive emotions dominate compared to negative emotions, indicating a pleasant learning experience. Class-related and Learning-related emotions show the highest total score of positive emotions, around 260, with negative emotions at 190. Meanwhile, related to Test-related emotions, the lowest score of positive emotions is around 210, and negative emotions around 170, reflecting more neutral emotions. These results emphasize that the learning environment and learning activities in the open air are more effective in encouraging positive emotional involvement. However, implementing the test requires an effective strategy to reduce emotional stress without reducing student motivation. One of the best strategies is implementing formative tests after the field trip to provide constructive feedback. This way, it can help students understand that tests are part of a strategy to measure conceptual and practical understanding based on field trip experiences, thereby increasing motivation without causing stress about tests.

The dominance of positive emotions in all academic conditions emphasizes the importance of creating a supportive learning environment to minimize the emergence of negative emotions in students. Designing practical experiences in geography education through field trips has created more meaningful and enjoyable learning. Direct interaction in the open field can enrich students' theoretical understanding and improve their understanding of geography material in authentic contexts. Not only in academic aspects, this activity can also strengthen students' skills, so field trips are a very effective strategy in education.

4.3. Interview Results: Student Perceptions of Field Trip Experiences

AEQ-S data showed that students who actively participated during the field trip in observation, practical activities, and interaction with the community more often reported positive emotions such as enjoyment and pride. The results of interviews conducted with 10 students obtained in-depth information about their emotional experiences during the field trip to the wetland ecosystem. Below is a summary of each respondent's statements:

4.3.1 . Dominant positive emotions

Most respondents reported experiencing positive emotions, such as joy, pride, and motivation, as a result of practical learning.

Joy from practical activities. Respondent 1 felt very happy because he could interact directly with the environment.

> *"I feel thrilled when observing and recording data on the physical appearance of wetlands. Moreover, when involved in practical activities such as planting mangrove trees, I feel proud to be able to contribute directly to environmental conservation".*

Fun social collaboration. Respondent 5 said that collaborating with friends made the experience more memorable.

> *"Collaborating with friends made this field trip more enjoyable and helped us bond".*

Motivation from direct experience. Respondent 8 felt more motivated by a direct approach in the field.

> *"Direct observation in the field excited me more than studying in class, and the lecturer also guided us in using the tool correctly".*

4.3.2. Ecological awareness and gaining new insights

Field activities also trigger a deeper awareness of environmental issues and open up new insights, especially from interactions with local communities.

Awareness of biodiversity. Respondent 4 is aware of the relationship between the environment and biodiversity.

> *"My observations on-site made me realize how much environmental characteristics impact biodiversity".*

Learning from local communities. Respondent 2 appreciated the insights gained from local communities.

> *"Interacting with the community provides new insights into how they manage natural resources sustainably".*

Stronger love for the environment. Respondent 10 felt the long-term impact through greater love for the environment.

> *"Field trip activities can develop a strong love for the environment and improve my understanding of geographical aspects, particularly regarding human interactions with nature".*

4.3.3. Technical Challenges and Emotional Transformation

Some students faced technical challenges that caused anxiety but managed to overcome them and felt confident.

Initial difficulties in using the tool. Respondent 3 felt confused when he had to use a pH meter for the first time.

> *"I feel confused about using the pH meter since I have never tried it before".*

The transformation from fear to confidence. Respondent 7 initially felt afraid but managed to overcome anxiety after trying.

> *"At first, I was afraid I would not be able to use the tool, but I gained confidence when I tried it and contributed to data collection".*

4.3.4. External Factors: Weather Obstacles and Physical Fatigue

External conditions such as hot weather and long journeys are challenges that affect the comfort of some students.

Hot weather that disrupts concentration. Respondent 6 felt uncomfortable with the high temperature during the activity.

> *"However, the hot weather made me uncomfortable, causing me to seek refuge more than I focused on observing".*

Fatigue from long journeys. Respondent 9 had difficulty staying focused due to the distance he had to travel.

> *"I feel tired when traveling long distances, which makes it hard for me to focus".*

The results of interviews with students regarding their experiences during field trips to wetland ecosystems showed that active participation in practical activities and social interactions can increase positive emotions such as enjoyment and pride and deepen understanding of biodiversity and environmental conservation. Although some students experienced confusion regarding using field data measurement tools and inconvenience related to weather and travel time, this emphasized the need for better support and preparation. This experience strengthened their love for the environment and provided deep insight into understanding aspects of geography, especially wetland ecosystems characteristic of their environment. Thus, students' activeness during field trips in observation and practical activities can strengthen positive emotions and support the creation of enjoyable learning.

5. Discussion

Based on the analysis of field trip locations, including peat swamp ecosystems and mangrove forests, both primary and secondary data reveal the use of environmental parameters to study ecological conditions. Based on the analysis of field trip location data covering peat swamp ecosystems and mangrove forests, primary and secondary data show that environmental parameters are by the conditions of the study location because they provide the data needed for this field trip. Stop sites 1 to 4 have proven to be relevant for studying geographical aspects related to wetland ecosystems in the context of higher education learning. Students gain valuable experience at each location through field data observation activities, practical activities, and interactions with local communities. By utilizing this location as part of geography learning, students understand the dynamics of wetland ecosystems and contribute to environmental conservation. By utilizing this location as part of geography learning, students understand the dynamics of wetland ecosystems and contribute to environmental conservation.

As part of the field trip location, wetlands can form in various landscape and climate variations, including humid areas with abundant surface water for a long time (high rainfall with low evapotranspiration) (Prasetya & Anisia, 2021; Tooth et al., 2015). This theory is based on the study location, which has high rainfall, humidity, and tributaries that cause abundant surface water. Wetlands usually have rich and unique ecosystems due to the presence of water and are rich in biodiversity (Deni Darmawan, 2016; Edwin-wosu & Dirisu, 2022; Jisha & Puthur, 2021). The vegetation in the location includes mangroves, Sonneratia caseolaris (Pedada), Nypa fruticans (Nipah), Sterculia foetida (Jangkang), Avicennia, Terminalia catappa (Ketapang), Cerbera manghas (Bintaro), Arenga pinnata (Aren), Ficus benjamina (Beringin), and several other florae. The fauna includes Bubalus bubalis (Kerbau rawa), Crocodylus porosus (Buaya Muara), Bronchocela jubata (Bunglon), Macaca fascicularis (monyet), Bucerotidae (Burung Enggang), Ardeidae (Burung Kuntul), Nisaetus nanus (Elang), Pythonidae (Ular Piton), and Helarctos malayanus (Beruang Madu).

Regarding human geography, coastal communities in fishing villages show strong adaptability to typical coastal geographic conditions, primarily through unique life patterns in managing water resources. Various studies have emphasized the importance of multicultural adaptation in coastal areas to face environmental challenges (Choirunnisa et al., 2022; Liata & Rizal, 2021; Rasyid & Amir, 2022). One important adaptation is the traditional method of rainwater harvesting, where people rely on rainwater collected in unique drums due to limited clean water sources due to brackish groundwater conditions. This is a common sight, especially during the dry season when rainwater is the only source of drinking water. Similar strategies are also carried out by communities in various coastal areas, such as in Bangladesh, which implements a Community-Based Rainwater Harvesting System (Mukarram et al., 2023), rooftop rainwater collection carried out by small island communities in Micronesia (Bailey et al., 2018), and also communities in Semarang, Indonesia with integrated rainwater harvesting by households (Dewi et al., 2023).

This adaptation illustrates how geographical conditions shape the local cultures inherent in coastal communities (Choirunnisa et al., 2022; Mao & Li, 2023; Nainggolan et al., 2023; Syamaun, 2019). Experiential learning through field trips offers students the chance to conduct data observations, which not only brings them closer to nature but also improves their critical thinking skills and teaches them to explore and analyze the potential for tourism development in these locations (Kisida et al., 2016; Patel, 2015; Rizal et al., 2024; Shamboul, 2022; Silviariza et al., 2021). Most students favor offline field trips because direct involvement in a real environment cannot be easily replaced by online learning, which provides less practical experience(Kurniawan et al., 2022).

Analysis of students' emotional experiences shows that learning in locations rich in geographical aspects can create a dominance of positive emotions such as enjoyment, hope, and pride, which reflects the effectiveness of field trips in increasing students' emotional engagement (Meyer & Turner, 2002; Pan et al., 2023). However, the presence of negative emotions such as anxiety and hopelessness, although small, indicates the need for attention to challenges such as technical anxiety or discomfort due to external factors such as weather. A holistic approach is needed to minimize these obstacles through better technical preparation and flexible activity arrangements (Hefferan et al., 2002; Sulaiman, 2017). With a conducive learning environment and positive feedback from lecturers, field trips can be a fun and effective educational process (Boyle et al., 2007; Dunphy & Spellman, 2009) while strengthening students' emotional connection to the material and their learning environment (Arsyad et al., 2024; Askins & Blazek, 2017).

Students tend to prefer learning environments where they can interact directly with nature as a learning resource, especially for those who study indoors daily. Thus, field trips provide a more active and in-depth geography learning experience. This finding is supported by Fuller's (2006) study, which stated that field trip in the mountains can improve students' understanding. In addition, research by Mann et al. (2022), which reviewed 147 study results from 2000 to 2022, showed that learning in the open air can improve academic aspects and develop social and collaborative skills. Research by Sejati et al. (2023) also showed that field trips to introduce karst, marine, and volcanic landscapes improved students' geographic literacy skills and critical thinking skills.

Analysis of students' emotional experiences during field trips in wetland ecosystems showed a significant relationship between active participation and positive emotions. This fact is based on the experiential learning theory (Kolb, 1984), which emphasizes that direct experience obtained through practical activities such as planting mangrove trees improves conceptual understanding and encourages feelings of pride and emotional bonds, as expressed by Respondent 1. Interaction with local communities, as experienced by Respondent 2, provides analytical thinking related to sustainable natural resource management practices so that students realize the importance of social context in enriching the learning experience.

However, some respondents reported negative experiences, such as confusion regarding using observation tools (Respondent 3) and discomfort due to the weather (Respondent 6). These challenges highlight the need for a more holistic approach, including initial training, to enhance students' confidence and enable them to actively engage and maximize the experiences and benefits gained from the field trip (Henry & Murray, 2018; Mohammed Abdullah AL-Balushi & Saazai bt Mat Saad, 2021; Plutino, 2016).

Thus, field trips are not only an alternative activity to overcome boredom in class but are an essential part of the geography curriculum in higher education that can deepen students' understanding and as a strategy to increase awareness of sustainable natural resource management. Furthermore, designing field trip activities through a more planned and inclusive approach will further strengthen the contribution of geography education to conserving wetland ecosystems.

6. Conclusion

This study shows that field trips to wetland ecosystems are meaningful learning moments with physical and human geographical aspects while creating enjoyable learning for geography education students. Active involvement of students during outdoor activities produces positive emotions, such as enjoyment and pride, which strengthen students' conceptual understanding. The results of the AEQS questionnaire showed that positive emotions dominated their experiences, while students rarely experienced negative emotions. Thus, field trips are an effective strategy for combining the complexity of geographical aspects at a location with meaningful learning, encouraging the development of analytical skills, providing insight into sustainable natural resource management, and preparing a generation more responsive to environmental issues. For the next field trip, it is recommended that technical preparation in using observation tools be improved, activities be organized more flexibly, and active student participation in every activity encouraged.

7. Conclusion

This study shows that field trips to wetland ecosystems provide a significant learning experience for Geography Education students by directly connecting physical and human geographical aspects. Through active involvement in outdoor activities, students feel positive emotions such as enjoyment and pride that deepen their understanding of the material. In order to improve this experience, there needs to be better technical preparation in the use of observation tools, as well as designing more flexible activities to engage students further. In addition, combining a multidisciplinary approach and providing challenges in the form of relevant case studies will enrich learning and help students develop analytical skills while increasing their awareness to be more concerned and responsive to current environmental problems.

Declarations

Author Contributions. Laili Rosita: Conceptualization, writing, data analysis/interpretation, securing funding. Sumarmi: Critical revision, design, supervision, final approval. I Komang Astina: Critical revision, design, supervision. Sugeng Utaya: Critical revision, design, technical support. Syamsul Bachri: Critical revision, design. All the authors have read and agreed to the published version.

Conflicts of Interest. The authors declare no conflict of interest.

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Ethical Approval. The studies involving human participants were reviewed and approved by the Ethical Committee of Universitas PGRI Palembang (reference number: 4039/R.E.36/UNIV.PGRI/2024). The participants provided their written informed consent to participate in this study.

Data Availability Statement. The data used in this study will be available upon request from the corresponding author.

Limitations. The limitation of this research is its scope, which is still limited in presenting the results of wetland field trip data carried out in the local environment. The calculation of location potential parameters is only carried out at certain sites, so the results might be different if carried out at other measurement sites.

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Appendix I.

Table 6. List of Interview Questions Regarding Participants' Emotional Experiences During Field Trip Activities to Wetland Ecosystems

Category	Questions
Emotional experiences	1. How did the field trip activities at this wetland make the participant feel? 2. What did the participant enjoy the most during this field trip? 3. Did the participant work together with their friends during the field trip activities? 4. Was this field trip activity more memorable because of the interaction and cooperation with their friends? 5. Did the lecturer's or instructor's guidance help the participant be actively involved in field trip activities?
Developing new insights	1. How did the field experience change the participant's perspective on the relationship between humans and nature, especially regarding biodiversity? 2. Did the participant interact well with the local community? 3. What did the participant learn from local people about how they manage natural resources? 4. Was there anything in the field that made the participant appreciate the importance of protecting nature and the environment more?
Use of field observation tools	1. How was the participant's experience using the field observation tool? 2. Did the new skills acquired in the field affect how the participant learns? 3. How did the participant feel about contributing to data collection using the field observation tool?
Challenges related to external factors	1. What factors made the participant uncomfortable and caused a lack of concentration during field activities? 2. Does the hot weather affect the participant's interaction with the surrounding environment or their practical activities during the field trip? 3. To what extent does the long journey affect the participant's experience or learning quality in the field?

Appendix II.

Table 7. List the Statements and Scores for the AEQ-S Class-related Emotions Questionnaire

No	Emotion Aspect	Statement	Score	Category
1	Enjoyment	I find learning enjoyable	90,8	Very high
		I look forward to attending this class	89,7	Very high
		I am very motivated by this field trip because it is fun	88	Very high
		I enjoy this learning, so I am very excited	87,4	Very high
2	Hope	I feel self-assured when I participate in class	87,4	Very high
		I am brimming with optimism	85,1	Very high
		My confidence comes from understanding the material	80,5	Very high
		Having confidence in my ability to grasp the material motivates me	86,8	Very high
3	Pride	I feel a sense of accomplishment about my self	89,7	Very high
		I feel that I have a reason to be proud of my understanding of this subject	85,7	Very high
		My sense of accomplishment in this course motivates me to to keep going	86,2	Very high
		When I perform well in class, I feel a deep sense of pride	88	Very high
4	Anger	I feel angry	34,8	Low
		Reflecting on the time I squander in class frustrates me	33,7	Average
		I wish I could avoid attending class, as it makes me feel upset	37,7	Average
		I sense it is accumulating within me	34,2	Low
5	Anxiety	I feel anxious	49,7	High
		Before class, I have concerns about my ability to comprehend the material.	49,1	High
		My anxiety makes me feel like skipping class	29,1	Low
		I feel uneasy when I'm in class	48	Low
6	Shame	I feel self-conscious	45	Average
		When I talk in class, it seems to me that I'm not doing it right	37,1	Average
		Once I speak, I wish I had disappeared	33,7	Low
		My embarrassment makes me tense and self-conscious	42,3	High
7	Hopelessness	I feel despairing	29,7	Low
		I have given up on the possibility of understanding this class	32,5	Low
		Since I have lost hope, I feel drained of energy to participate in class	29,1	Low
		My sense of despair depletes my energy	32	Low
8	Boredom	I lost interest	36,5	Average
		The lecture feels uninterestin	33,7	Low
		I consider other activities I would prefer to engage in instead of being in class	33,1	Low
		I feel restless waiting for class to finish	39,4	Average

Table 8. List the Statements and Scores for the AEQ-S Learning-related Emotions Questionnaire

No	Emotion Aspect	Statement	Score	Category
1	Enjoyment	I enjoy to tackle the challenge involved in learning the material	82,2	Very high
		I take pleasure in engaging with the course material	84,5	Very high
		My happiness with the progress I have made fuels my motivation to keep studying	88	Very high
		Success in my gives me an exhilarating feeling in my studies	87,4	Very high
2	Hope	I feel assured while studying	87,4	Very high
		I believe in my ability to understand the material.	81,1	Very high
		I stay hopeful about making good progress in my studies.	85,1	Very high
		My confidence drives my motivation	89,7	Very high
3	Pride	I take pride in myself	90	Very high
		I believe my academic achievements are something to be proud of	83	Very high
		My desire to feel pride in my accomplishments keeps me motivated	84,2	Very high
		When I do well, I am filled with pride.	83	Very high
4	Anger	Studying irritates me	32,1	Low
		I worry about whether I can handle all the work	33,9	Low
		I often feel the urge to distract myself to lessen my Anxiety while studying	27,2	Low
		Fear of not finishing the material causes me to sweat	39,3	Average
5	Anxiety	Studying makes me tense and anxious	35,1	Low
		I worry about whether I can handle all the work	46,6	Average
		I often feel the urge to distract myself to lessen my Anxiety while studying	47,8	Average
		The anxiety of not completing the material causes me to feel uneasy	58	High
6	Shame	I experience a sense of embarrassment	43,6	Average
		I am embarrassed as I recognize my lack of ability	56,3	High
		Due to my difficulties with the material, I refrain from discussing it	41,2	Average
		I look away when people realize how little I understand	44,8	Average
7	Hopelessness	I feel helpless	32,7	Low
		I've accepted that I may not be capable of mastering this material	36,3	Average
		There are times when I feel so inundated that I find it hard to concentrate on my studies	35,7	Average
		My low self-confidence leaves me feeling exhausted even before I start	41,8	Average
8	Boredom	I feel uninterested while studying for my classes	30,9	Low
		The material is so lacking in engagement that I find myself drifting off	36,9	Average
		I prefer to procrastinate on this tedious work	35,1	Low
		My mind tends to wander because the material is uninteresting	29,6	Low

Table 9. List the Statements and Scores for the AEQ-S Test-related Emotions Questionnaire

No	Emotion Aspect	Statement	Score	Category
1	Enjoyment	I take pleasure in sitting for the exam	68,4	High
		For me, the test represents a challenge that I find quite enjoyable	56,9	High
		Because I enjoy preparing for the exam, I am motivated to go beyond what is required	58,7	High
		Before the exam, I experience a feeling of enthusiasm	67,2	High
2	Hope	I'm confident that everything will turn out well	75,5	High
		I'm completely sure of myself	74,5	High
		I approach my exam with an optimistic mindset	78,7	High
		My self-assurance motivates me to study diligently	73,3	High
3	Pride	I feel proud of my achievements	80,6	High
		I take pride in my performance on the exam	61,8	High
		My pride in my knowledge drives me to put in effort during the test	67,2	High
		Once the exam was over, I felt a sense of accomplishment, standing taller with pride	56,3	High
4	Relief	After the exam, I feel a weight lifted off my shoulders	80,6	High
		After the exam, I feel a sense of freedom	64,8	High
		Once the exam was over, the tightness in my stomach began to ease	72,7	High
		After the exam, I felt a wave of relief wash over me.	72,7	High
5	Anger	I become upset	43,6	Average
		I feel embarrassed for not answering the questions correctly	40	Average
		I hope I could convey my frustration to the lecturer	29,6	Low
		My anger brings a surge of heat to my head	28,4	Low
6	Anxiety	I'm feeling quite uneasy	51,5	High
		I'm worried that the test might be too challenging	53,9	High
		I'm so anxious that I want to miss the exam	30,9	Low
		When the test begins, my heart begins to race	47,8	Average
7	Shame	I feel ashamed	40	Average
		I get flustered due to my difficulty in answering the questions correctly	63	High
		I become so humiliated that I just want to run away	50,9	Average
		Out of shame, my heart begins to race	45,4	Average
8	Hopelessness	I fell defeated	27,2	Low
		I begin to think that no matter how think that how hard I try, I won't pass the test	29	Low
		I feel like surrendering	27	Low
		I fell completely drained and out of energy	28,4	Low