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Curriculum Design for Ecotourism with an Environmental Literacy Approach in Higher Education: A Qualitative Study

Zohra Alipour Torbati[1], Mehboobeh Soleimanpour Omran[2]*, Behrang Esmaili Shad[3]

1. PhD student, Department of Educational Management, Bojnurd Branch, Islamic Azad University, Bojnurd, Iran.
2. Assistant Professor, Department of Educational Management, Bojnurd Branch, Islamic Azad University, Bojnurd, Iran (Corresponding Author).
3. Assistant Professor, Department Educational Management, Bojnurd Branch, Islamic Azad University, Bojnurd, Iran.

*** Corresponding author email address**: m.pouromran@gmail.com

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A B S T R A C T

Purpose: This study aimed to explain and identify the design of an ecotourism curriculum with an environmental literacy approach in higher education.

Methodology: The research design was qualitative, specifically a qualitative case study. In this context, faculty members from the fields of curriculum planning, social sciences, and environmental studies at selected universities were considered as expert participants. Using a purposive sampling approach, key informants were selected, and semi-structured interviews were conducted with 17 individuals until theoretical saturation was reached. The data obtained were analyzed using thematic analysis. Reliability was ensured through retesting and intra-subject agreement methods, while validity was confirmed through expert review and content validity checks. The findings were organized into themes.

Findings: Based on the results, a matrix framework of curriculum elements (objectives, content, teaching methods, and assessment) was developed. Five organizing themes and 76 basic themes were identified, and a thematic network was extracted. The curriculum design for a "green curriculum" in the Iranian education system (as an overarching theme) and the organizing themes encompassing five dimensions: objectives, content, teaching methods, assessment, and skills and competencies, were highlighted. Each category contains various dimensions within the basic themes, which were organized as the ecotourism curriculum with an environmental literacy approach in higher education.

Conclusion: The findings of this study provide the foundation for implementing an ecotourism curriculum with an environmental literacy approach in higher education.

Keywords: *Curriculum, Ecotourism, Environmental Literacy, Higher Education, Qualitative Approach.*

1. Introduction

Ecotourism has evolved over the past few decades from a niche segment of the tourism industry into a significant component of global efforts to promote sustainable development. Defined broadly as responsible travel to natural areas that conserves the environment and improves the well-being of local people, ecotourism presents an innovative approach to balancing environmental conservation with socio-economic development (Kiper, 2013). It is increasingly recognized for its potential to foster environmental stewardship, support biodiversity conservation, and provide economic opportunities for communities that live in or near natural areas (Ardiansyah et al., 2023; Jurkus et al., 2022).

As the global demand for sustainable travel experiences grows, the educational sector, particularly higher education, is tasked with preparing future professionals who are knowledgeable and skilled in the principles and practices of ecotourism. This preparation is crucial, as the success of ecotourism initiatives largely depends on the capacity of individuals and organizations to design, implement, and manage projects that align with both conservation goals and community needs (Bouwer et al., 2021; Pasape et al., 2017). Consequently, integrating ecotourism into higher education curricula has become increasingly important for cultivating the next generation of ecotourism leaders, conservationists, and community advocates.

The importance of ecotourism in the educational context is multi-faceted. First, ecotourism provides a practical and experiential platform for environmental education, allowing students to engage directly with natural environments and gain a deeper understanding of ecological processes, conservation challenges, and sustainable practices (Song, 2024; Walter & Reimer, 2012). This experiential learning is critical for developing not only knowledge but also the values and attitudes necessary for responsible environmental stewardship (Alves, 2024; Walker & Moscardo, 2014).

Second, ecotourism education contributes to the development of critical thinking and problem-solving skills. By confronting students with real-world environmental and socio-economic issues, ecotourism curricula encourage them to think creatively about solutions that balance ecological integrity with human well-being (Min, 2017; Mondino & Beery, 2018). This problem-based learning approach is particularly relevant in the context of sustainable development, where complex and often conflicting interests must be reconciled.

Moreover, the interdisciplinary nature of ecotourism—encompassing aspects of ecology, sociology, economics, and cultural studies—makes it an ideal subject for fostering a holistic understanding of sustainability (Cini et al., 2015; Figueroa & Figueroa, 2018). Students exposed to ecotourism education are better equipped to appreciate the interconnectedness of natural and human systems, an understanding that is critical for addressing the global sustainability challenges of the 21st century (Arrobas et al., 2020; Jamal et al., 2011).

Despite its potential, however, the integration of ecotourism into higher education curricula is often inconsistent and limited. Many educational institutions have yet to fully incorporate ecotourism into their programs, resulting in a gap between the industry's needs and the competencies of graduates entering the workforce (Bouwer et al., 2021; Francis et al., 2017). This discrepancy underscores the need for a more systematic approach to ecotourism education, one that ensures students are not only knowledgeable about ecotourism principles but also skilled in applying them in diverse and complex contexts (Bouwer et al., 2021).

The current state of ecotourism education reflects a broader challenge in the field of environmental education, where practical, field-based learning experiences are often undervalued or underutilized (King et al., 2020; Uzama & Walter, 2018). Yet, as numerous studies have shown, the most effective environmental education programs are those that engage learners in hands-on, experiential activities that connect them directly with the natural world (Boes, 2013; Walker & Moscardo, 2014; Walter, 2013; Walter & Reimer, 2012). In this regard, ecotourism offers a unique and powerful vehicle for delivering impactful environmental education.

The literature also highlights the importance of aligning ecotourism curricula with the principles of education for sustainable development (ESD), which emphasizes the integration of knowledge, skills, values, and attitudes needed to contribute to sustainable development (Mondino & Beery, 2018; Nakagawa, 2016). This alignment ensures that ecotourism education not only imparts technical knowledge but also fosters the ethical and moral perspectives necessary for responsible action in the face of environmental and social challenges (Bowles & Ruhanen, 2018).

To effectively integrate ecotourism into higher education, it is essential to develop curricula that are both comprehensive and adaptable. Such curricula should be grounded in interdisciplinary content (Bezi et al., 2024;

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Faramarzi Babadi et al., 2024; Karimi et al., 2023; Khosravi & Mehrmohammadi, 2023)s that reflects the multifaceted nature of ecotourism, including its ecological, socio-cultural, and economic dimensions (Figueroa & Figueroa, 2018). Additionally, they should incorporate experiential teaching methods that provide students with opportunities to engage with real-world ecotourism practices and challenges (Alves, 2024; Song, 2024).

Assessment in ecotourism education should also go beyond traditional exams and essays to include practical evaluations, such as the design and implementation of ecotourism projects (Zheng et al., 2021). These assessments not only test students' knowledge and skills but also encourage them to think critically about the impacts of their actions and decisions on the environment and local communities (Rocha et al., 2022). Furthermore, the curriculum should aim to develop a wide range of competencies, including technical skills, critical thinking, communication, and cultural competence, all of which are essential for success in the field of ecotourism (Cardoso et al., 2014; Pasape et al., 2017).

In summary, the integration of ecotourism into higher education is a necessary and urgent endeavor, one that requires a comprehensive and systematic approach. By developing curricula that are interdisciplinary, experiential, and aligned with the principles of sustainable development, educational institutions can prepare students to become informed and responsible practitioners who are capable of addressing the complex challenges of ecotourism and sustainability. As the demand for sustainable travel and conservation continues to grow, so too does the need for skilled professionals who can lead the way in creating and managing ecotourism initiatives that benefit both people and the planet (Jamal et al., 2011; Kumar, 2023; Kumar & Sheryazdanova, 2021). This study aimed to explain and identify the design of an ecotourism curriculum with an environmental literacy approach in higher education.

2. Methods and Materials

2.1. Study Design and Participants

The research design of this study is qualitative, specifically employing a qualitative case study method, which allows for an in-depth and precise examination of the subject and the discovery of hidden dimensions.

Potential participants in the study included experts from various specialized fields related to ecotourism, such as ecology, earth sciences, environmental monitoring, environmental education, tourism, humanities and culture, community planning, as well as experts in curriculum studies. These participants were identified using a purposive sampling approach, specifically the "key informant selection method," and interviews were conducted with 17 individuals until theoretical saturation was achieved. The research data were collected through semi-structured interviews based on the qualitative interview model, adhering to its standards. The researcher, after making the necessary arrangements, conducted the interviews at the participants' workplaces, recording the conversations with their consent to extract codes. This process was repeated after each interview. The duration of each interview was 50 minutes, and the interview process was conducted in 2022. In the qualitative section of this research, semi-structured interviews were employed. During individual interviews, six preliminary interview questions were used, derived from the research topic, model, and objectives. The collected data were analyzed using thematic analysis and the construction of a thematic network, which is one of the fundamental and effective methods of qualitative analysis. The analysis involved open coding, axial coding, and selective coding. Following this stage, the researcher tested the developed model using quantitative research methods to assess its validity. The use of qualitative methods was motivated by the lack of a strong theoretical and empirical background and the absence of consensus among researchers on the research topic. In the model testing phase, the accuracy of the identified indicators was evaluated. To assess the validity of the resulting thematic network, qualitative validation criteria such as acceptability and trustworthiness were applied.

For data collection, semi-structured interviews were utilized. The researcher, after making the necessary arrangements, conducted the interviews at the participants' workplaces, recording the conversations with their consent to extract codes. This process was repeated after each interview. The duration of each interview was 50 minutes, and the interview process was conducted in 2022. In the qualitative section of this research, semi-structured interviews were employed. During individual interviews, six preliminary interview questions were used, derived from the research topic, model, and objectives. Test-retest reliability and intra-subject agreement methods were employed to calculate the reliability of the interviews. For the test-retest reliability calculation, a few interviews were selected as samples, and each of them was re-coded after a short, specified time interval. The codes identified at the two different times for each interview were then compared. The

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test-retest method is used to assess the stability of the researcher's coding. In each interview, codes that were similar at the two time points were labeled as "agreement," while dissimilar codes were labeled as "disagreement."

In this study, the reliability coefficient between the codings was found to be 82.1%, indicating acceptable reliability. To calculate the reliability of the interviews using the intra-subject agreement method, one of the university professors familiar with coding was asked to participate as a secondary coder in the research. The researcher, along with this research colleague, coded three interviews, and the percentage of intra-subject agreement, which serves as an index of analytical reliability, was calculated. The reliability obtained from the two coders was 77.8%. To assess validity, content validity was employed. For quantitative content validity, the Content Validity Ratio (CVR) and Content Validity Index (CVI) were used. Since both the CVR and CVI were greater than 0.7, it can be confirmed that the questionnaire possesses the necessary validity. Additionally, for assessing the validity of the qualitative phase of this research, the "expert auditing method" was used. In this method, the researcher explains how the themes were derived and how decisions were made throughout the research for auditing and confirmation by the expert, thereby enhancing the reliability of the research findings.

In any study, as a whole, data collection, data organization, and data analysis are interdependent. For analyzing the data obtained from interviews as well as theoretical foundations, three types of coding were used: open coding, which is an analytical process where concepts are identified and their characteristics and dimensions are discovered in the data; axial coding, which is the process of relating categories to subcategories and linking categories at the level of their properties and dimensions, and is called "axial" because it occurs around the "axis" of a category; and selective coding, which is the process of integrating and refining categories. The theory is written based on the relationships between the categories present in the axial coding model.

In the qualitative section, after conducting the interviews, open coding, axial coding, and selective coding were employed for data analysis. The researcher attempts to achieve a better understanding of the text by going back and forth within the text. In each iteration, partial findings that are inconsistent or contradictory to the more robust previous findings are discarded. This iterative process continues until an acceptable understanding of the text is reached, with minimal internal contradictions.

3. Findings and Results

In this section, the main research question is addressed based on the collected data:

What are the components of an ecotourism curriculum with an environmental literacy approach in higher education?

After reviewing the interview texts, the relevant literature, and thoroughly studying the literature on the ecotourism curriculum, the results are presented in Table 1. Table 1 shows the components of ecotourism with an environmental literacy approach. This categorization includes one main theme (overarching) titled "Green Curriculum Design," five second-level (organizing) themes, and 76 basic themes. In the objectives component, 28 themes were identified; in the content component, 8 themes; in the teaching methods component, 13 themes; in the assessment component, 14 themes; and in the competencies and skills component, 13 themes were identified.

The findings of this study are presented through the analysis of qualitative and quantitative data. In the qualitative phase, open coding was utilized to identify relevant concepts, followed by axial coding to extract core categories, and finally, selective coding was used to systematically relate the central phenomenon to other categories. This process not only validated the relationships between categories but also identified areas needing further development, resulting in the creation of a hypothetical qualitative model. The axial coding process, supported by expert feedback and revisions, led to the identification of five main categories deemed significant in the context of metaverse implementation in schools. These categories, along with their associated components, are presented in Table 1.

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Table 1

The Results of Qualitative Analysis

Organizing Themes	Basic Themes
Objectives	Familiarity with the objectives and definitions of ecotourism and ecosystems, Sustainable and responsible tourism, Tourism agencies and transportation, Attracting tourists at the international level, Understanding tourist guiding techniques, Understanding barriers to ecotourism development and their solutions, Familiarity with the science of sociology and ecotourism, Familiarity with the science of economics and ecotourism, Familiarity with rural and nomadic tourism, Familiarity with the customs and traditions of Iranian ethnic groups and other nations, Understanding different types of tourism (geotourism, hydrotourism, biotourism, climatourism), Understanding cultural and natural factors affecting tourism, Understanding ways to engage local communities, Understanding eco-lodges, Developing and enhancing naturalistic intelligence, Evaluation and monitoring of ecotourism, Developing a systemic perspective on society and nature, Understanding ecology, Familiarity with tourism ethics, Understanding protected areas, Familiarity with nature from spiritual and religious perspectives, Familiarity with nature from aesthetic and artistic perspectives, Principles and methods of environmental conservation, Promoting the culture of nature tourism and ecotourism, Familiarity with environmental science and sustainable development patterns, Respect for local community culture, Familiarity with the principles of tourism entrepreneurship, Planning and designing ecotourism infrastructure
Content	Integrated and interdisciplinary content, Integrating practical and theoretical content, Use of multimedia materials, Use of various content formats, Inductive content delivery, Unit work and individual and group projects, Content aligned with local, national, regional, and global needs, Use of flexible and supplementary content
Teaching Methods	Practical and theoretical teaching and teaching in nature, Use of social teaching model families, Group work-based methods, Conducting internships and skills-based courses, Active teaching methods based on environmental literacy, Online and virtual teaching based on environmental literacy, Cooperative and interactive teaching based on environmental literacy, Exploratory and problem-based methods based on environmental literacy, Grouping students, Peer-assisted learning based on environmental literacy, Project-based approach, Outdoor activities, Discussion, debate, and lecture
Assessment	Diagnostic, formative, and summative assessment, Performance tests, Continuous assessment, Mixed quantitative and qualitative assessment, Attention to assessment in three dimensions: knowledge, skills, and attitudes, Assessment based on participation in problem-solving, Assessment based on critical environmental literacy, Assessment based on creativity and innovation in solving environmental issues, Peer assessment and self-assessment, Assessment based on performance in real environments, Assessment tools include checklists, performance tests, and attitude scales, Evaluation of attention to the aesthetic and artistic aspects of the environment, Evaluation of the level of moral and spiritual environmental growth
Competencies and Skills	Ability to communicate with the local community, Ability to convey information to tourists, Public speaking and oratory skills, Scientific and technological literacy, Research and investigation skills, Survival skills in challenging conditions, Photography and filming skills in nature, Interpretation skills and knowledge, Proficiency in specialized language, Entrepreneurial skills, Ability to adapt and be flexible with the environment, Ecotourism planning and design skills, Ability to implement ecotourism programs

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The second research question: What ecotourism curriculum model can be proposed to enhance environmental literacy in higher education?

The ecotourism curriculum model aimed at enhancing environmental literacy in higher education is presented in three dimensions: knowledge, skills, and attitudes, across the elements of the curriculum, including objectives, content, teaching methods, assessment, and competencies and skills. The final themes are also depicted in the following diagram:

Figure 1

Final Conceptual Model

4. Discussion and Conclusion

The purpose of this study was to develop a comprehensive ecotourism curriculum with an environmental literacy approach tailored for higher education. The research identified key components of such a curriculum, including objectives, content, teaching methods, assessment strategies, and the development of competencies and skills. This section discusses the findings in the context of existing literature, demonstrating how they align with or diverge from previous studies and highlighting the implications for both theory and practice.

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The study revealed that the objectives of an ecotourism curriculum should emphasize a deep understanding of ecological principles, sustainable tourism practices, and socio-economic aspects of ecotourism. This is consistent with previous studies that underscore the need for ecotourism education to integrate environmental conservation with socio-economic development (Mondino & Beery, 2018; Pasape et al., 2017). The emphasis on familiarizing students with the definitions and objectives of ecotourism, sustainable tourism, and the role of local communities reflects the findings of Walter and Reimer (2012), who argue that such foundational knowledge is essential for developing a holistic understanding of the interconnectedness of natural and human systems (Walter & Reimer, 2012). Furthermore, the identified objective of promoting ethical responsibility in tourism practices aligns with the ethical considerations highlighted by Bowles and Ruhanen (2018), who emphasize the importance of disseminating environmental ethics and values in ecotourism education (Bowles & Ruhanen, 2018).

The content of the curriculum, as identified in this study, should be interdisciplinary, integrating knowledge from ecology, sociology, economics, and cultural studies. This interdisciplinary approach is supported by the findings of Figueroa and Figueroa (2018), who advocate for a curriculum that reflects the multifaceted nature of ecotourism (Figueroa & Figueroa, 2018). The inclusion of both theoretical content and practical knowledge in the curriculum echoes the suggestions of Pham and Khanh (2020), who stress the importance of combining theory with practice to better prepare students for real-world challenges in ecotourism management (Pham & Khanh, 2020). Additionally, the emphasis on using multimedia materials and various content formats supports the findings of Alves (2024), who highlights the role of technology in enhancing the sustainability and effectiveness of ecotourism education (Alves, 2024).

The study's findings regarding teaching methods suggest that experiential learning is crucial for effective ecotourism education. Practical and field-based teaching methods, including teaching in nature and conducting internships, were identified as key components of the curriculum. These findings are in line with previous research by Boes (2013) and Song (2024), who both emphasize the value of hands-on learning in natural settings for deepening students' understanding of ecological and conservation issues (Boes, 2013; Song, 2024). The use of project-based and problem-based learning approaches, as identified in this study, aligns with the findings of Min (2017) and Mondino and Beery (2018), who advocate for these methods as they promote critical thinking and problem-solving skills in the context of sustainability challenges (Min, 2017; Mondino & Beery, 2018).

Assessment strategies identified in this study include both formative and summative assessments, with a focus on evaluating students' knowledge, skills, and attitudes towards environmental stewardship. This multidimensional approach to assessment is supported by the findings of Zheng et al. (2021), who argue that effective assessment in ecotourism education should go beyond traditional exams to include practical evaluations such as the design and implementation of ecotourism projects (Zheng et al., 2021). The emphasis on continuous assessment and the use of peer and self-assessment methods aligns with the suggestions of Jurkus et al. (2022), who recommend these approaches for encouraging students to critically reflect on their learning and contributions to environmental sustainability (Jurkus et al., 2022).

Finally, the development of competencies and skills was highlighted as a crucial component of the curriculum. The identified skills, including critical thinking, communication, cultural competence, and technical skills related to ecotourism operations, are essential for success in the field. These findings are consistent with the literature, which underscores the importance of equipping students with a wide range of skills that are relevant to both ecotourism and broader sustainability goals (Cardoso et al., 2014; Pasape et al., 2017). The emphasis on ethical decision-making and the ability to work effectively with diverse stakeholders reflects the findings of Bowles and Ruhanen (2018), who argue that these competencies are critical for promoting responsible and sustainable ecotourism practices (Bowles & Ruhanen, 2018).

Despite the valuable insights provided by this study, there are several limitations that should be acknowledged. First, the study's qualitative approach, while providing in-depth understanding and rich data, limits the generalizability of the findings. The sample size, although sufficient for qualitative analysis, may not be representative of all higher education institutions or ecotourism educators, which may affect the broader applicability of the curriculum components identified. Additionally, the study was conducted within a specific cultural and geographical context, which may influence the relevance of the findings in different regions or educational settings.

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Another limitation is the reliance on self-reported data from interviews, which may be subject to biases such as social desirability or recall bias. Participants may have provided responses that they believed were expected or socially acceptable rather than their true perspectives. Moreover, the study did not include quantitative measures to validate the identified curriculum components, which could have strengthened the robustness of the findings.

Finally, the study did not explore the implementation challenges of the proposed curriculum in actual educational settings. Understanding the potential barriers to integrating such a curriculum into existing programs, such as institutional constraints, faculty readiness, and resource availability, would have provided a more comprehensive picture of the feasibility of the curriculum.

Future research should address the limitations of this study by expanding the scope and methodology. Quantitative research, including surveys or experimental designs, could be employed to validate the findings and assess the generalizability of the curriculum components across different educational institutions and cultural contexts. A larger and more diverse sample would allow for the examination of potential differences in perspectives among various stakeholders, including students, faculty, and industry professionals.

Moreover, longitudinal studies could be conducted to evaluate the long-term impact of the proposed curriculum on students' knowledge, skills, and attitudes towards environmental stewardship and sustainable tourism. Such studies would provide valuable insights into the effectiveness of the curriculum in achieving its educational objectives and in preparing students for careers in ecotourism.

Research should also explore the practical challenges and opportunities associated with implementing the curriculum in higher education settings. This could include case studies of institutions that have adopted the curriculum, examining the factors that facilitated or hindered its integration and the outcomes achieved. Additionally, investigating the role of technology in enhancing the delivery of ecotourism education, such as through virtual reality or online learning platforms, could provide innovative solutions for overcoming some of the logistical constraints associated with field-based learning.

For educational institutions and practitioners seeking to integrate ecotourism into their curricula, several practical recommendations emerge from this study. First, it is crucial to adopt an interdisciplinary approach that draws on knowledge from various fields, including ecology, sociology, economics, and cultural studies. This will provide students with a comprehensive understanding of the complex interactions between tourism, conservation, and community development. Institutions should also emphasize experiential learning by incorporating field trips, internships, and project-based learning into the curriculum. These hands-on experiences are essential for deepening students' understanding of ecological processes and conservation challenges, as well as for developing practical skills relevant to the field of ecotourism.

Furthermore, assessment strategies should be designed to evaluate not only students' cognitive knowledge but also their skills, attitudes, and ethical understanding. This could involve a combination of formative and summative assessments, including practical evaluations, peer assessments, and self-assessments. Such an approach will encourage students to critically reflect on their learning and their contributions to environmental sustainability.

Finally, educational institutions should prioritize the development of competencies and skills that are essential for success in ecotourism. This includes not only technical skills related to tourism operations but also broader competencies such as critical thinking, communication, cultural competence, and ethical decision-making. By equipping students with these skills, institutions can ensure that graduates are prepared to lead and manage sustainable tourism initiatives that benefit both the environment and local communities.

In conclusion, while this study provides a robust framework for developing an ecotourism curriculum with an environmental literacy approach, its findings should be considered within the context of the study's limitations. Further research and practical efforts are needed to validate and refine the proposed curriculum and to ensure its successful implementation in higher education settings.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

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Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

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