

Fostering Sustainable Tourism Innovation through Agro-Eco-Edu-Tourism: A Teaching Factory (TeFa) Collaboration Between Vocational Schools and Destination Managers in Batu City

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ABSTRACT

This study examines the implementation of the Agro-Eco-Edu-Tourism Program in the Teaching Factory (TeFa) model, a collaborative effort between vocational high schools and tourism destination managers in Batu City, aimed at integrating sustainability into tourism education and practice. A qualitative multi-site case study design was employed, collecting data through interviews, observations, and documentation from a public and a private vocational high school, both offering hospitality and tourism programs. Informants included school principals, teachers, students, and tourism managers. Findings indicate that the program successfully integrates eco-friendly practices into tourism operations through organic farming, eco-guided tours, the use of local products in hospitality services, and renewable energy adoption. These initiatives have enhanced tourism destinations by attracting eco-conscious visitors and promoting regional sustainability. For students, the program provided practical skills, real-world industry exposure, increased employability, and expanded professional networks. The results highlight the potential of school-industry collaboration to foster innovation in sustainable tourism education. Key challenges identified include the need for better coordination among stakeholders, deeper community involvement, and the integration of advanced eco-tourism technologies. The Agro-Eco-Edu-Tourism Program demonstrates an effective model for merging educational outcomes with sustainable tourism development. Strengthening stakeholder collaboration and securing long-term funding are recommended to enhance program sustainability.

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1. INTRODUCTION

The growing demand for sustainable tourism has emerged as a global trend, driven by heightened environmental awareness and a collective shift toward more responsible travel practices. In response to the adverse effects of climate change, travellers increasingly seek destinations aligned with sustainability principles, emphasizing ecological conservation, cultural heritage preservation, and the well-being of local communities. Sustainable tourism balances economic growth with environmental preservation,

ensuring that tourism development conserves natural resources and protects ecosystems while enhancing local livelihoods (Zagarkhorloo et al., 2021; Ogweno, 2021). Key aspects of this approach include responsible waste management, energy-efficient infrastructure, support for local businesses, and biodiversity protection (Kotlyarova et al., 2020; Kostić et al., 2018). Destinations embracing these practices are more attractive to eco-conscious travelers, creating opportunities for regions to contribute meaningfully to a sustainable future.

Batu City, with its abundant natural landscapes and rich agricultural heritage, presents a unique opportunity for agro-eco-tourism development—a sector that integrates sustainable agricultural practices with eco-tourism (Utomo et al., 2015; Razti et al., 2022). The city's lush mountains, farms, and wildlife provide an ideal setting for initiatives such as organic farming tours, eco-friendly accommodations, and educational workshops that engage both visitors and locals in sustainability practices (Baral, 2023). Agro-eco-tourism diversifies revenue streams for the agricultural sector by attracting tourists interested in farming techniques, agro-tourism activities, and locally produced goods. These initiatives drive economic growth while promoting ecological conservation and community engagement, establishing a sustainable tourism model for the region (Anup, 2018; Sajib et al., 2022).

Vocational High Schools (VHS) have increasingly adopted practical, industry-oriented learning models like the Teaching Factory (TeFa) to bridge the gap between academic knowledge and real-world applications (Sudarsono, 2023). These models emphasize hands-on experiences, enabling students to apply theoretical knowledge in controlled, practical environments. Collaborations between VHS and local tourism destinations, particularly in eco-tourism, hospitality, and sustainable agriculture, offer significant educational opportunities by exposing students to real-world industry practices (Sudarsono, 2023). This collaboration enriches students' learning experiences and equips them with critical skills in customer service, sustainable tourism management, and eco-friendly practices, enhancing employability and preparing them for modern workforce demands. By participating in live projects and partnerships, students gain practical insights into the challenges and demands of the tourism industry, improving career prospects while contributing to sustainable tourism initiatives (Prastawa et al., 2020).

The Agro-Eco-Edu-Tourism program represents a significant innovation in vocational training, integrating agriculture, education, and tourism to provide multifaceted experiential learning. Embedding this program within the Teaching Factory (TeFa) framework allows VHS to deliver hands-on experience in sustainable tourism practices while supporting the development of local eco-tourism destinations. This approach engages students in agricultural practices, eco-friendly tourism operations, and environmental conservation efforts, fostering a deeper understanding of sustainability and its practical applications (Iftayani & Nursidiq, 2020). Students gain valuable skills in managing eco-friendly tourism initiatives, operating sustainable agricultural ventures, and educating visitors about preserving natural resources. This immersive learning model positions students as advocates for responsible tourism and enhances the appeal of local destinations through sustainable practices. The program also strengthens collaboration between education and industry, ensuring students are well-prepared for the demands of the tourism sector while supporting the growth of community-based tourism initiatives (Mustikawanto, 2019).

As global travellers and tourism industries strive to minimize environmental impacts while maximizing community benefits, the urgency for sustainable tourism innovation continues to grow. Collaborations between VHS and destination managers through programs like Agro-Eco-Edu-Tourism are essential for fostering innovative, sustainable tourism solutions (Perdinan, 2024; Sugiyanto et al., 2023). By integrating eco-friendly practices into curricula and hands-on learning experiences, students develop strategies for sustainable tourism, such as creating eco-friendly accommodations, designing low-impact tourism experiences, and promoting sustainable agricultural tourism practices (Djuwendah et al., 2023; Kaikara, 2024). These innovations enhance students' skills and directly contribute to local sustainable tourism initiatives (Kaikara, 2024; Ma, 2024). Promoting responsible tourism practices—including reducing carbon footprints, preserving local culture, and supporting local businesses—attracts eco-

conscious travelers and ensures long-term success by preserving resources for future generations. Collaborative efforts between the tourism sector and educational institutions play a critical role in shaping a sustainable tourism future aligned with global sustainability goals (Alipour et al., 2020; Dewi, 2023).

Despite the recognized benefits of Agro-Eco-Edu-Tourism programs in enhancing students' practical skills, strengthening school-industry partnerships, and promoting sustainable tourism practices (Warouw et al., 2021; Silalahi, 2021; Syarifah et al., 2019; Akinci et al., 2017; Simanullang et al., 2022; Mak & Ng, 2014), there remains a significant gap in understanding how such programs can be systematically integrated into vocational high school (VHS) curricula to maximize long-term impacts on both local communities and the tourism industry. Previous studies have largely focused on isolated case studies or short-term outcomes, with limited attention to the program's comprehensive role in fostering sustainable development across educational, economic, and environmental dimensions (Armiati et al., 2018; Rawlinson & Dewhurst, 2013). Addressing this gap, the present study aims to explore the strategic implementation of Agro-Eco-Edu-Tourism programs as a sustainable model for vocational education, tourism innovation, and community empowerment. By investigating the multi-stakeholder benefits and the program's potential to transform educational practices and tourism destinations, this research offers a novel contribution to the fields of educational tourism and sustainable development. Ultimately, the study seeks to propose a framework that enhances the synergy between education, industry, and tourism for mutual growth and sustainability.

2. METHODS

This study employed a qualitative approach with a multi-site case study design, focusing on two vocational high schools (one public and one private) in Batu City that offer hotel and tourism programs and implement the Agro-Eco-Edu-Tourism program. The multi-site case study design allowed for comparative analysis across different settings, providing insights into both the similarities and the unique aspects of program implementation in diverse school environments. This approach was suited to exploring the in-depth, contextual details of the program's execution and its impact on sustainable tourism practices.

Data collection techniques included interviews, observations, and documentation review. In-depth interviews were conducted with a range of informants: key informants such as school principals and tourism managers overseeing the program; primary informants, including teachers directly involved in the program's operations; and secondary informants, consisting of students participating in the program. Observations were carried out during the program's daily activities within the schools and at associated tourism sites to capture real-time interactions and implementation dynamics. Supporting documents such as program reports, teaching materials, and promotional content were analyzed to provide additional context and to triangulate the findings. Informants were selected through purposive sampling, based on their roles and experiences with the program, to ensure the collection of relevant and diverse information.

For data analysis, the study employed the interactive model developed by Miles, Huberman, and Saldaña, involving three main stages: data condensation, data display, and drawing and verifying conclusions. During data condensation, the collected information was systematically coded and organized, with key patterns and themes identified and categorized. Data display involved structuring and visualizing these patterns to facilitate interpretation and comparison across the two schools. Finally, conclusions were drawn and verified through an iterative analysis process, ensuring that interpretations were both accurate and reflective of the underlying data. This analytical approach provided a comprehensive understanding of the implementation, innovation outcomes, and educational benefits of the Agro-Eco-Edu-Tourism program within vocational schools in Batu City.

3. FINDINGS AND DISCUSSION

3.1 Implementation of the Agro-Eco-Edu-Tourism Program in the Teaching Factory (TeFa) through Collaboration between Vocational High Schools and Tourism Managers

The Agro-Eco-Edu-Tourism Program integrated into the Teaching Factory (TeFa) framework represents a strategic collaboration between vocational high schools and tourism destination managers. The program aims to provide vocational students with hands-on learning experiences within real-world tourism environments, focusing on sustainability and practical skills relevant to eco-friendly tourism. Through this partnership, students in hospitality and tourism majors gain exposure to agro-tourism activities, ecological practices, and educational roles within tourism, aligning their training with both industry needs and sustainable development goals.

Table 1. Implementation of the Agro-Eco-Edu-Tourism Program in the Teaching Factory (TeFa)

Implementation Aspect	Description	Outcomes	Informant Source
Program Objectives	To provide students with practical tourism and hospitality skills through hands-on experiences in real tourism environments.	Improved student engagement and understanding of sustainable tourism practices.	School Principal, Teachers
Collaboration Model	Partnership established between vocational schools and local tourism destination managers to co-manage student learning activities.	Stronger industry connections; students have opportunities for real-world exposure.	School Principal, Tourism Manager
Curriculum Integration	Agro-Eco-Edu-Tourism elements are integrated into the hotel and tourism courses, focusing on agriculture, ecology, education, and tourism components.	Enhanced curriculum relevance; prepares students for careers in eco-friendly tourism.	Teachers, Curriculum Documents
Hands-On Activities	Activities include agro-tourism tours, eco-friendly practices, and educational workshops at tourism sites, led by industry professionals and teachers.	Students gain practical skills in tourism management, environmental stewardship, and customer service.	Teachers, Students
Skill Development Focus	Emphasis on vocational skills such as hospitality, tourism management, eco-tourism principles, and sustainable practices.	Increased student skills in hospitality and eco-tourism, aligning with industry needs.	Teachers, Students
Stakeholder Roles	School faculty oversee academic integration; tourism managers	Clear division of roles improves program effectiveness and	School Principal, Tourism Manager

	provide industry insights and facilitate hands-on experiences.	collaborative relationship sustainability.	
Challenges	Scheduling conflicts, balancing academic curriculum with practical training, and logistical challenges in transportation to tourism sites.	Better planning and resource allocation are needed to ensure smooth program operation.	School Principal, Teachers, Students
Student Perceptions	Positive feedback on practical experiences; students feel better prepared for tourism industry careers through real-world practice.	Increased motivation and career interest among students.	Students
Impact on Sustainable Tourism Awareness	The program raises awareness of sustainable practices by educating students on environmental and cultural preservation in tourism.	Improved student knowledge and commitment to sustainable tourism practices.	Teachers, Tourism Manager, Students

The implementation of this program has shown significant benefits in several areas. First, the curriculum integration of agro-Eco-Edu-tourism elements has effectively bridged theoretical learning with practical experience, allowing students to participate in agro-tourism tours, eco-friendly practices, and workshops facilitated by industry professionals. These activities have enriched the students' understanding of eco-tourism and hospitality management, making them better prepared for sustainable tourism roles after graduation. Moreover, the collaboration model, which leverages both school faculty and tourism managers, ensures students receive comprehensive guidance from both academic and industry perspectives, enhancing the overall quality of the educational experience.

However, challenges in scheduling and balancing the academic curriculum with practical training were noted. Students and teachers indicated logistical difficulties in organizing trips to tourism sites and managing academic workloads. These challenges highlight the need for better coordination between schools and destination managers to optimize resource allocation and planning. Despite these logistical issues, the positive feedback from students on their increased motivation and preparedness for future tourism careers underscores the program's value. Enhanced sustainable tourism awareness among students, reflected in their commitment to eco-friendly practices, further illustrates the program's impact on fostering a new generation of environmentally conscious tourism professionals.

3.2 Sustainable Tourism Innovation Produced By The Agro-Eco-Edu-Tourism Program

The Agro-Eco-Edu-Tourism Program has introduced several sustainable tourism innovations that positively impact the tourism destinations involved. By integrating eco-friendly practices and emphasizing educational experiences, the program contributes to environmental conservation while also supporting local economies. These innovations align with global sustainable tourism trends, catering to the growing demand for eco-conscious travel and creating unique experiences for visitors in Batu City.

Table 2. Sustainable Tourism Innovation Produced By The Agro-Eco-Edu-Tourism Program

Innovation Aspect	Description	Impact on Tourism Destinations	Informant Source
Eco-Friendly Farming Practices	Integration of organic farming techniques and waste reduction methods in agro-tourism activities.	Attracts eco-conscious visitors and promotes sustainable agriculture in tourism.	Tourism Manager, Teachers
Sustainable Visitor Experiences	Development of guided eco-tours emphasizing environmental preservation and local culture.	Enhances visitor awareness of sustainability, leading to responsible tourism practices.	Teachers, Students, Tourism Manager
Educational Workshops	Workshops on sustainable agriculture and tourism are offered to visitors, led by students and supported by destination staff.	Creates added value for visitors; positions the destination as a leader in eco-education.	Teachers, School Principal
Local Product Integration	Use of locally sourced products in hospitality services, such as food and souvenirs, supporting local artisans and farmers.	Boosts the local economy, promotes cultural heritage, and appeals to sustainability-minded tourists.	School Principal, Tourism Manager
Renewable Energy and Resource Use	Adoption of renewable energy sources and water-saving techniques within tourism facilities where feasible.	Reduces operational costs and environmental footprint, appealing to eco-tourists.	Tourism Manager, Teachers

One of the program's notable innovations is the use of eco-friendly farming practices, such as organic agriculture and waste reduction methods, within agro-tourism activities. This approach not only attracts visitors interested in sustainable agriculture but also sets a model for environmentally friendly operations within the tourism sector. Additionally, the development of guided eco-tours focused on environmental preservation and local culture has enhanced the appeal of these destinations, encouraging visitors to engage responsibly and appreciate sustainable practices. This initiative has been especially effective in promoting sustainable tourism values to both locals and tourists, fostering a culture of environmental stewardship within the community.

Another impactful innovation is the integration of locally sourced products in hospitality services, which supports local artisans and farmers, boosting the area's economy and preserving cultural heritage. Educational workshops on sustainable agriculture, often led by students and tourism managers, have also added educational value, making these destinations stand out as eco-education leaders. Furthermore, the adoption of renewable energy and resource-saving techniques in tourism facilities aligns the program with broader environmental goals, reducing costs and attracting eco-conscious travelers. Collectively, these innovations have positioned the Agro-Eco-Edu-Tourism Program as a model for sustainable tourism that benefits both the environment and local communities.

3.3 Benefits of the Agro-Eco-Edu-Tourism Program in the Teaching Factory (TeFa) for Schools and Students

The Agro-Eco-Edu-Tourism Program integrated into the Teaching Factory (TeFa) framework offers numerous benefits for both schools and students, particularly in terms of skill development and industry exposure. By involving students in hands-on, real-world activities in eco-tourism, hospitality, and sustainable agriculture, the program equips them with essential skills for the growing sustainable tourism sector. The collaboration with local destination managers also ensures that students gain direct industry insights, improving their readiness for professional careers after graduation.

Table 3. Benefits of the Agro-Eco-Edu-Tourism Program in the Teaching Factory (TeFa)

Benefit Aspect	Description	Impact on Schools and Students	Informant Source
Skill Development in Eco-Tourism	Students acquire hands-on skills in eco-tourism management, hospitality, and environmental sustainability practices.	Increased employability and better preparedness for careers in sustainable tourism and hospitality.	Teachers, Students
Practical Industry Exposure	Real-world exposure to tourism and hospitality industry operations through collaboration with local destination managers.	Provides valuable insights into the industry's operations, fostering students' industry-specific knowledge and confidence.	School Principal, Tourism Manager
Enhanced Problem-Solving Skills	Engaging in on-site problem-solving activities related to sustainable tourism and agro-tourism practices.	Students develop critical thinking and decision-making skills, especially in real-time, on-site scenarios.	Teachers, Students
Networking Opportunities	Students have the chance to build connections with tourism professionals and local business owners.	Strengthens career prospects by offering networking opportunities with industry leaders.	Students, Tourism Manager
Improved Understanding of Sustainable Practices	Exposure to sustainable farming, eco-tourism, and environmental education programs.	Deepened understanding of sustainable tourism and its benefits, helping students advocate for eco-conscious practices.	Teachers, Students

One of the key benefits of the program is the development of specialized skills in eco-tourism and sustainable practices. Students are given the opportunity to work on-site in real tourism environments, learning how to manage eco-friendly tourism projects, handle hospitality operations, and apply environmental sustainability practices. This hands-on experience significantly enhances their employability, making them more competitive in the eco-tourism and hospitality industries. Moreover, the practical exposure to the tourism industry allows students to gain valuable insights into its operations, preparing them with industry-specific knowledge that will be useful in their future careers.

In addition to skill development, the program fosters essential soft skills, such as problem-solving and networking. Students engage in real-time problem-solving activities on tourism sites, allowing them to sharpen their decision-making and critical thinking abilities in practical settings. Networking

opportunities with industry professionals, including tourism managers and local business owners, further enhance students' career prospects by expanding their professional connections. The program also deepens students' understanding of sustainable tourism practices, fostering a commitment to environmental conservation and social responsibility, which are essential values in the modern tourism industry.

Discussion

Implementation of the Agro-Eco-Edu-Tourism Program in the Teaching Factory (TeFa) as a Collaborative Effort Between Vocational High Schools and Tourism Destination Managers

The Agro-Eco-Edu-Tourism Program integrated into the Teaching Factory (TeFa) framework represents a strategic collaboration between vocational high schools and tourism destination managers. This program provides vocational students with hands-on learning experiences in real-world tourism environments, emphasizing sustainability and practical skills relevant to eco-friendly tourism. The partnership enables students majoring in hospitality and tourism to gain exposure to agro-tourism activities, ecological practices, and educational roles within tourism, aligning their training with both industry needs and sustainable development goals.

The integration of Agro-Eco-Edu-Tourism elements into the curriculum has proven beneficial by connecting theoretical knowledge with practical experiences, such as agro-tourism tours and eco-friendly workshops led by industry professionals. This approach enhances students' understanding of sustainable tourism, preparing them for future roles in the field (Fuchs, 2023; García & Hernández, 2021). The collaboration between academic faculty and tourism managers further enriches the educational experience, providing diverse perspectives that bolster students' readiness for the workforce (Boluk et al., 2019). However, logistical challenges in scheduling and balancing academic workloads with practical training have been identified. Students and educators have reported difficulties in organizing site visits, indicating a need for improved coordination between educational institutions and tourism managers to optimize planning and resource allocation (Yeong et al., 2021). Despite these challenges, student feedback highlights increased motivation and a commitment to eco-friendly practices, underscoring the program's effectiveness in cultivating environmentally conscious tourism professionals (Farsari, 2021; Moreno-Luna et al., 2021).

The Agro-Eco-Edu-Tourism Program exemplifies innovative practices that integrate eco-friendly farming and renewable energy into tourism, enhancing both environmental sustainability and local economies. By adopting organic agriculture and waste reduction methods, the program not only attracts eco-conscious visitors but also sets a benchmark for sustainable operations in the tourism sector, aligning with findings that emphasize the positive relationship between renewable energy and tourism growth (Dávid et al., 2019; Khan et al., 2021). Moreover, the initiative's focus on locally sourced products supports regional artisans and farmers, thereby preserving cultural heritage while boosting the economy (Riojas-Díaz et al., 2022). Educational workshops led by students and tourism managers further enrich the visitor experience, establishing these destinations as leaders in eco-education (Bundzíkóvá & Jánošová, 2021). The implementation of renewable energy solutions in hospitality services not only reduces operational costs but also appeals to environmentally aware travelers, reinforcing the program's commitment to sustainable tourism (Bano et al., 2021). Collectively, these strategies foster a culture of environmental stewardship among both tourists and locals, positioning the program as a model for sustainable tourism practices (Işık et al., 2017).

The program's emphasis on eco-tourism and sustainable practices equips students with specialized skills essential for managing eco-friendly tourism projects. Practical experiences in real tourism environments enhance their employability by providing industry-specific knowledge and insights into hospitality operations (Ogweno, 2021; Lee & Jan, 2017). Furthermore, the hands-on approach fosters critical soft skills, including problem-solving and networking, as students engage in real-time decision-making and connect with industry professionals (Nguyen & Thanh, 2023; Kurniawati, 2015). This exposure not only prepares students for competitive roles in the eco-tourism sector but also instills a commitment to environmental conservation and social responsibility, which are increasingly vital in today's tourism landscape (Callixte & Tushabe, 2021; Stronza et al., 2019). By integrating sustainable practices into their training, students emerge as informed advocates for responsible tourism, ready to contribute positively to both the industry and the environment (Sajib et al., 2022; Gu, 2023).

Addressing Logistical and Curriculum Challenges

Despite the significant benefits of the program, logistical and curriculum-related challenges emerged as major barriers to its long-term sustainability. Scheduling conflicts and the difficulty of balancing academic coursework with practical training created obstacles for both students and teachers. For instance, organizing visits to tourism sites often clashed with regular class schedules, and the added demands of field activities placed additional pressure on students' academic workloads.

Addressing these challenges requires stronger coordination between schools and tourism destination managers. One solution is to develop a structured timetable that integrates field visits directly into the academic calendar, minimizing conflicts. Schools could also allocate specific days for on-site training, allowing students to engage fully in practical activities without disrupting their academic commitments. In addition, the use of digital tools—such as online simulations and virtual field trips—could supplement hands-on learning and help ease logistical burdens.

Another important strategy is to revise the curriculum to better integrate agro-eco-edu-tourism modules, ensuring that practical elements are treated as core components rather than optional extras. Collaborating with tourism managers to co-design these modules would help align educational content with industry needs while preserving academic standards. By institutionalizing these improvements, the program's sustainability can be strengthened, enabling a smoother integration of practical and theoretical learning experiences.

Sustainable Tourism Innovation Produced by the Program

The Agro-Eco-Edu-Tourism Program has introduced several innovations that support the development of sustainable tourism. By integrating eco-friendly practices and emphasizing educational experiences, the program contributes meaningfully to environmental conservation and local economic growth. One of the key innovations is the adoption of eco-friendly farming practices, including the use of organic agriculture methods and waste reduction strategies within agro-tourism activities. These initiatives not only attract eco-conscious visitors but also serve as a model for sustainable tourism operations.

Another significant innovation is the development of guided eco-tours that focus on environmental preservation and the promotion of local culture. These tours enhance visitor engagement while fostering a deeper appreciation for responsible tourism practices. In addition, the program has integrated the use of locally sourced artisan and agricultural products within its hospitality services, supporting the local economy and helping to preserve cultural heritage.

Educational workshops have also been established as part of the program, featuring collaborations between students and tourism destination managers. These workshops focus on sustainable agriculture practices and help to position the destinations as leaders in eco-education. Furthermore, tourism facilities participating in the program have adopted resource-saving techniques, including the use of renewable energy sources and other environmentally conscious practices, aligning with broader sustainability goals and appealing to environmentally aware travelers.

Through these innovations, the Agro-Eco-Edu-Tourism Program not only enhances the attractiveness of participating destinations but also serves as a replicable model for other regions seeking to integrate sustainability principles into their tourism strategies.

Reflections, Implications, and Future Directions

This study's findings are primarily based on the implementation of the Agro-Eco-Edu-Tourism Program in two vocational high schools, which limits the generalizability of the results to other educational contexts and regions. Expanding future research to include a broader sample of schools and tourism destinations would provide a more comprehensive understanding of the program's strengths and challenges. Additionally, longitudinal studies that track the long-term impacts on students' career trajectories and the sustainability outcomes of tourism destinations would offer deeper insights into the program's effectiveness over time.

The findings also highlight important implications for vocational education and sustainable tourism policy. The Agro-Eco-Edu-Tourism Program demonstrates significant potential to bridge the gap between vocational education and industry needs. For policymakers, the program emphasizes the importance of fostering strong partnerships between educational institutions and tourism stakeholders to cultivate a workforce skilled in sustainable tourism practices. Strengthening these collaborations can support broader sustainable development goals while ensuring that vocational education remains aligned with evolving industry demands.

For educational institutions, the program's success underlines the value of integrating practical experiences into the curriculum. Schools should prioritize the development of interdisciplinary modules that combine hospitality, agriculture, and environmental science, equipping students with comprehensive skills suited for the eco-tourism sector. Furthermore, the collaborative model established between schools and tourism managers offers a blueprint for similar partnerships in other industries, helping to bridge the gap between academic learning and real-world applications.

To further enhance understanding and communication of the program's implementation, the use of visual aids such as flowcharts or collaboration diagrams is recommended. For instance, a diagram illustrating the roles of schools, tourism managers, and students could clarify the collaborative framework, while a timeline or infographic summarizing key innovations could make the program's outcomes more accessible and engaging for stakeholders.

By addressing these areas, the Agro-Eco-Edu-Tourism Program can continue to evolve as a leading example of how sustainability can be effectively integrated into vocational education, contributing meaningfully to the advancement of sustainable tourism development.

4. CONCLUSION

Based on the research objectives, this study concludes that the implementation of the Agro-Eco-Edu-Tourism Program within the Teaching Factory (TeFa) model has been an effective collaboration between vocational high schools and tourism destination managers, significantly contributing to sustainable tourism innovation. The program successfully integrated eco-friendly practices and educational components into tourism operations, equipping students with practical skills in eco-tourism management, sustainable agriculture, and hospitality. Innovations such as sustainable farming

techniques, guided eco-tours, and the incorporation of local products have enhanced tourism destinations by attracting eco-conscious visitors and promoting environmentally responsible practices. Moreover, the program has provided valuable industry exposure, skill development, and networking opportunities for students, while simultaneously supporting the growth of eco-friendly tourism destinations in Batu City. However, the study's scope was limited to two vocational high schools, which constrains the generalizability of the findings to other educational settings and regions. Future research should include a wider range of schools and tourism destinations to capture more diverse perspectives and assess long-term outcomes on student careers and destination sustainability. To further enhance the program's impact, it is recommended that schools and tourism managers strengthen coordination to better align academic and practical schedules, actively involve local communities to deepen cultural connections, integrate advanced technological tools to modernize learning experiences, and seek additional funding and partnerships to sustain and expand program initiatives. Through these efforts, the Agro-Eco-Edu-Tourism Program can continue to serve as a model for integrating vocational education with sustainable tourism development.

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