



# Tourism Education Curriculum Adaptation Strategy in Facing Technological Developments and Digitalization

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## ABSTRACT

Technological developments and digitalization have brought transformative changes to the global tourism industry landscape. From digital marketing, online reservations, augmented reality (AR) and virtual reality (VR) based traveler experiences, to big data analytics for service personalization, the tourism sector is now heavily reliant on digital innovation. This phenomenon requires tourism education to adapt proactively to produce relevant and job-ready graduates. This research aims to identify and analyze the adaptation strategy of the tourism education curriculum in facing the challenges and opportunities posed by technological developments and digitalization. Using a qualitative approach with a case study method, data was collected through in-depth interviews with key stakeholders (academics, industry practitioners, and alumni) as well as analysis of curriculum documents from several leading tourism educational institutions. The results of the study indicate that effective curriculum adaptation strategies include the integration of digital-oriented courses, improving lecturers' competencies in digital literacy, developing technology learning facilities, and strengthening collaboration with industry. The main challenges faced are resistance to change, resource limitations, and the dynamic pace of technological development. The implications of this study emphasize the urgency of adapting a sustainable curriculum to ensure the relevance of graduates in the increasingly digital tourism job market.

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## INTRODUCTION

The global tourism industry is currently in the midst of an unprecedented digital revolution. Since the beginning of the 21st century, especially with the advent of the internet, social media, and mobile platforms, the way travelers plan, experience, and share their trips has fundamentally changed (Buhalis & Law, 2008). This digital transformation not only affects the way tourism businesses operate, but also the expectations of consumers who are increasingly informed and looking for personalized and efficient experiences (Werthner & Klein, 1999). From sophisticated online reservation systems, mobile applications for navigation and destination information, the use of artificial intelligence (AI) in customer service, to the use of *big data* for the personalization of offers, technology has become the operational and strategic backbone of modern tourism (Mariani et al., 2016). The COVID-19 pandemic has even accelerated the adoption of digital technology in the tourism sector, forcing a rapid adaptation to contactless and virtual solutions for business sustainability (Sigala, 2020).

These technological developments and digitalization put significant pressure on the tourism education system. A curriculum that is irrelevant to the demands of the digital job market will result in graduates who are not prepared for the realities of the industry. If tourism education remains stagnant with traditional approaches that focus on conventional

operational management, then the gap between graduate skills and industry needs will widen further (Goeldner & Ritchie, 2012). This competency gap can result in high graduate unemployment, or at the very least, the need for extensive retraining by employers, ultimately to the detriment of both individuals and industries. Therefore, curriculum adaptation is imperative, not only for relevance, but also for the competitiveness of graduates and the sustainability of the tourism industry itself (Komulainen & Ruohotie, 2002).

The tourism education curriculum, which traditionally includes subjects such as hotel management, travel agency operations, conventional tourism marketing, and tourism geography, must now be enriched with essential digital competencies. These competencies include, but are not limited to, digital marketing, social media management, tourism data analytics, digital platform development and management, understanding new technologies such as AI, blockchain, AR/VR in tourism, and cybersecurity in the context of tourism (Liu et al., 2019; Sigala, 2018). More than just technical skills, graduates also need to develop broad digital literacy, which is the ability to find, evaluate, use, and create information using digital technology effectively and responsibly (Bawden, 2008).

Various studies have underlined the importance of adapting the higher education curriculum in the face of industrial changes. For example, in a general business context, companies need graduates who have a strong understanding of automation and data (Manyika et al., 2017). In the tourism sector, research shows that digital skills are one of the most sought-after attributes by employers (WTTC, 2017). However, despite the urgency of this adaptation, implementation on the ground often faces challenges. Universities may find it difficult to update the curriculum quickly due to bureaucracy, lack of competent lecturer resources in the digital field, limited technological infrastructure, and resistance to changes from within the institution (Kwok & Tso, 2012).

The adoption of digital technology in learning itself is also an important aspect of curriculum adaptation. The use of learning management systems (LMS), open learning resources (OER), virtual simulations, and digital laboratories can improve the quality and accessibility of tourism education (Huang et al., 2016). Teaching methods should shift from a traditional lecturer-centric model to more interactive, collaborative, and project-based learning that reflects practices in the industry. For example, a real-life case study from an industry implementing digital solutions can be integrated into lecture materials, or the final project can involve the development of a digital marketing campaign for a tourism destination.

The importance of collaboration between academics and industry practitioners cannot be overstated in the curriculum adaptation process. The industry is the party that best understands the latest trends and skills needs. These partnerships can take the form of relevant internships, guest lectures from industry professionals, joint research projects, or curriculum development involving direct input from the tourism sector (Porter, 1985). Through this collaboration, the curriculum can remain responsive to market dynamics, ensuring that graduates have not only theoretical knowledge but also much-needed practical skills.

This research aims to identify and analyze the adaptation strategies of the tourism education curriculum that have been or are being implemented to deal with technological developments and digitalization. The main research question is: "How do tourism education institutions in Indonesia adapt their curricula to deal with technological developments and digitalization in the tourism industry, and what are the challenges and opportunities in this adaptation process?" By answering this question, this research is expected to provide a more comprehensive understanding of best practices in curriculum adaptation, as well as identify barriers that need to be overcome. The results of this study will have practical implications for education policymakers, administrators of tourism educational institutions, curriculum developers, and lecturers in designing and implementing a curriculum that is relevant,

innovative, and globally competitive in the digital age. Thus, tourism education can continue to contribute to producing professionals who are not only proficient in tourism operations, but also skilled in utilizing technology to create innovation and added value.

## METHOD

This study adopts a qualitative approach with a multiple case study design to analyze in depth the adaptation strategy of the tourism education curriculum in response to the rapid development of technology and digitalization. The qualitative approach was chosen because it provides flexibility for researchers to gain a holistic understanding of complex and contextual phenomena, as well as exploring diverse perspectives from stakeholders directly involved (Creswell, 2014).

The research participants were purposively selected from three leading tourism higher education institutions in Indonesia that are known to be innovative in their study programs. A total of 15 informants were involved, including six academics (lecturers/heads of study programs) who are active in curriculum development, six tourism industry practitioners engaged in technology and digital (such as digital marketing managers, platform developers, or tourism technology consultants), and three alumni of the tourism study program with at least two years of work experience in the digital industry.

Data is collected through two main methods. First, semi-structured in-depth interviews were conducted with all participants. The interview questions are designed to explore their understanding of the impact of digitalization on tourism, curriculum adaptation strategies that have been implemented, emerging challenges and opportunities, essential digital competencies for graduates, as well as suggestions for future curriculum development. Each interview is recorded and transcribed verbatim. Second, document analysis was carried out on the course syllabus, Semester Learning Plan (RPS), study program descriptions, and academic policy documents related to curriculum innovation from the three institutions. This analysis aims to identify integrated digital elements, relevant new courses, and the vision and mission of the institution in facing the digital era.

Qualitative data from interview transcripts and documents were analyzed using a thematic analysis approach (Braun & Clarke, 2006). The process involves several stages: familiarization of the data by reading and reviewing the entire material, followed by initial coding to identify relevant segments of text. Next, similar codes were grouped for a broader search of themes, and the themes were then reviewed to ensure consistency with the data and research questions. After that, each theme is clearly defined and named to capture its essence. Finally, the writing of the report is carried out by presenting findings based on identified themes, supported by direct excerpts from interviews and evidence from documents. To improve the validity of the data, this study applied source triangulation (through interviews and document analysis) and member checking by confirming the researcher's interpretation to several participants.

## RESULTS AND DISCUSSION

### Result

Data analysis from in-depth interviews and curriculum documents from three tourism education institutions shows several key themes related to curriculum adaptation strategies in the face of technological developments and digitalization, as well as the challenges and opportunities that come with them.

### *Digital-Oriented Course Integration*

Almost all institutions have embarked on efforts to integrate courses that explicitly address the digital aspect of tourism. This is manifested in the form of new courses or additional modules within existing courses.

- a. Tourism Digital Marketing: Courses such as "Digital Marketing in Tourism," "Social Media for Hospitality and Tourism," and "Search Engine Optimization (SEO) for Tourism Businesses" have been introduced.

*Lecturer A:* "We are aware that our graduates must be able to compete in the digital era. Therefore, *digital marketing courses* are mandatory, and we try to include direct practice."

- b. Tourism Data Analytics and Big Data: Some institutions are starting to introduce the basics of data analytics for tourism.

*Lecturer B:* "We now have a big data introduction module in the tourism research course, the goal is for students to understand how data can be used for service personalization."

- c. Emerging Technologies: Topics such as AR/VR in the traveler experience, *blockchain* for tourism transactions, and the role of AI in customer service are starting to be mentioned, although they have not yet become in-depth self-paced courses.

*Lecturer C:* "AR/VR is a forward trend. We are trying to insert it in the tourism product innovation course, although it is still limited to theory and case examples."

### ***Improving Lecturer Competence in Digital Literacy***

It was found that there are institutional efforts to increase the capacity of lecturers in mastering digital technology and applying it in teaching.

- a. Training and Workshops: The institution organizes regular training on the use of *Learning Management System (LMS)*, digital tools for learning, and tourism technology trends.

*Lecturer A:* "There is mandatory training every semester on the latest digital tools. This is important because lecturers also have to *update*."

- b. Further Study and Collaboration: Some lecturers are individually actively taking online courses or collaborating with industry to deepen their understanding.

*Alumnus 1:* "I see that there are some lecturers who are very *up-to-date* with technology, which is very helpful. But there are also those who are still lagging behind."

### ***Development of Technology-Based Learning Facilities***

Institutions are starting to invest in infrastructure that supports digital learning.

- a. Computer Labs with Specialized Software: Provision of reservation management software (PMS), global distribution systems (GDS), and data analysis tools.
- b. Virtual/AR/VR Simulation Studios: Some institutions are starting to explore the use of immersive technology for hotel operational simulations or destination experiences.

*Industry Practitioner X:* "We are often visited by students for internships. Those who can use *tools* such as Google Analytics or automated *booking engines* are a plus."

### ***Strengthening Collaboration with the Tourism Industry***

Closer relationships with industry practitioners are considered crucial to maintain the relevance of the curriculum.

- a. Digital-Based Internship Programs: The institution encourages students to intern in tourism companies that are actively using digital technology.
- b. Guest Lectures and Guest Lectures: Industry professionals are invited to share their experiences and the latest trends.
- c. Joint Curriculum Development: Some institutions proactively involve industry representatives in the curriculum review and development process.

*Industry Practitioner Y:* "We are happy to be invited to discuss what students need to learn. Sometimes there is a *gap* between theory on campus and needs in the field."

### **Challenges in Curriculum Adaptation**

Despite efforts, some major challenges are still faced.

- a. Speed of Technological Development: Curriculum often lags behind very fast technological innovation.

*Lecturer B:* "Technology is changing very quickly. We have just adopted one system, there is already a new one. The curriculum must therefore be constantly revised."

- b. Limited Resources: Lack of funds for technology investment, lecturer training, and advanced facilities.
- c. Resistance to Change: Some lecturers may be reluctant to adapt to new technology-based teaching methods or content.

*Lecturer C:* "There are senior lecturers who feel comfortable in the old way. This is a challenge to equalize perceptions."

- d. Lecturer Skills Gap: Not all lecturers have adequate background or competence in the field of digital technology.
- e. Too Dense Curriculum: Difficulty in adding new courses or modules without sacrificing the existing core material.

### **Opportunities from Curriculum Adaptation**

Curriculum adaptation also opens up various opportunities.

- Increased Relevance of Graduates: Graduates are more prepared to work and have high competitiveness.
- Learning Innovation: Technology allows for more interactive and engaging teaching methods.
- Improving Research Quality: Lecturers and students can utilize data and digital *tools* for more in-depth research.
- Improved Institutional Image: Institutions that are responsive to industry changes will have a better reputation.

### **Discussion**

The results of this study clearly show that tourism education institutions in Indonesia are trying to adapt their curricula to respond to the digitalization wave. This effort is consistent with the recommendations of experts that education should be proactive in preparing the workforce for the digital economy (Manyika et al., 2017; WTTC, 2017). The integration of digital-oriented courses such as digital marketing and data analysis is a crucial step, given that

these skills are at the core of modern tourism operations (Buhalis & Law, 2008). Marketing of destinations and tourism products is now dominated by online platforms, social media, and data-driven campaigns, so a deep understanding of digital tools and strategies is fundamental for graduates.

Improving lecturer competence is a determining factor for the success of curriculum adaptation. Lecturers are the main facilitators of learning; if they are not tech-savvy or reluctant to adapt, the implementation of digital curriculum will be hampered (Kwok & Tso, 2012). Therefore, investing in ongoing training and encouraging lecturers to engage in relevant industry research or practice is essential. Limited resources and resistance to change, as expressed by informants, are classic challenges in educational innovation, but they can be overcome through strong leadership, adequate budget allocation, and attractive professional development programs (Fullan, 2007).

The development of technology-based learning facilities, such as computer labs with specialized software and the potential use of AR/VR studios, supports experiential learning (Kolb, 1984). Simulation environments can provide a practical experience without the risks or high costs associated with real-life situations, allowing students to try and fail in a safe environment. This is in line with the paradigm shift in education towards a more student-centered and competency-based approach.

Collaboration with the tourism industry is a vital aspect that underscores the relevance of the curriculum. The views of industry practitioners regarding the skills most needed are invaluable in designing relevant courses (Porter, 1985). Structured internships, guest lectures, and joint projects ensure that students are exposed to the latest best practices and technologies in the field. This helps bridge the gap between academic theory and the practical demands of industry, which is often a criticism of higher education. Alumni, as a bridge between the academic and professional worlds, provide valuable perspectives on the suitability of the curriculum with their work experience.

Despite progress, the challenges of rapid technological development and resource limitations remain significant obstacles. The tourism industry continues to innovate with generative AI, *metaverse*, and hyper-local data-driven personalization, which demands a curriculum to be always responsive. Educational institutions should develop more agile mechanisms for updating the curriculum, perhaps through the modularization of learning or the introduction of microcertification programs that can be updated faster than a full degree. Overall, an effective curriculum adaptation strategy in tourism education in the digital age is a holistic approach that involves:

1. Content revision: Includes relevant and up-to-date digital subjects.
2. Teacher capacity building: Ensure lecturers have strong digital literacy and a willingness to innovate.
3. Adequate infrastructure: Provide technological facilities and *tools* for learning.
4. Strong industry partnerships: Building bridges between the campus and the real world of work.

By comprehensively implementing this strategy, tourism education institutions can ensure that they produce graduates who are not only able to compete, but also lead innovation in the increasingly digital tourism industry. It is a long-term investment for the sustainability and growth of the national tourism sector.

**c**

This research underlines the urgency and complexity of adapting the tourism education curriculum in the face of rapid technological developments and digitalization. The findings show that tourism education institutions in Indonesia have been proactive in implementing various adaptation strategies, including the integration of digital-oriented courses such as digital marketing and data analysis, improving lecturers' digital competencies through training, developing technology-based learning facilities, and strengthening collaboration with industry. These strategies are a fundamental step to ensure that graduates have relevant skills and are ready to compete in the technology-dominated tourism job market.

Nevertheless, this adaptation process is not free from challenges. The exponential pace of technological development often exceeds the ability of the curriculum to adapt quickly. Limited resources, both financial and competent human resources, as well as resistance to change from several internal parties, are also significant obstacles. However, the opportunities that open up through this adaptation are much greater, including increasing the competitiveness of graduates, innovations in learning methods, and strengthening the institution's position in the midst of the digital era.

The main implication of this study is the recommendation for education policymakers, institutional administrators, and curriculum developers to continue to strengthen these adaptation strategies in a sustainable and comprehensive manner. This requires greater investment in lecturer training, the provision of cutting-edge technological infrastructure, and the establishment of a more flexible and responsive curriculum mechanism. Close and ongoing collaboration with industry practitioners is key to maintaining the relevance of the curriculum to the needs of the dynamic market. Thus, tourism education can continue to play a vital role in producing superior talents who not only understand tourism traditionally, but are also able to master and utilize technology to encourage innovation and sustainability of Indonesia's tourism industry in the future.

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