

Digital transformation in tourism education: driving forces and challenges

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Abstract

This systematic literature review examines the implementation of digital transformation in tourism and hospitality education through an analysis of 20 peer-reviewed articles published between 2019-2024. The study employs a rigorous methodological approach involving systematic database searches, strict inclusion-exclusion criteria, and qualitative content analysis to identify key themes, implementation challenges, and strategic recommendations. The findings reveal a significant disparity in digital transformation implementation between developed and developing nations. While developed countries primarily focus on optimizing technological utilization and pedagogical innovation, developing nations face fundamental challenges including inadequate infrastructure and pronounced digital divides. The analysis identifies several development opportunities, including enhanced learning flexibility, improved digital literacy, and the integration of advanced technologies such as AI and IoT in tourism education. The study's practical implications emphasize the importance of establishing robust digital frameworks, implementing comprehensive educator training programs, and adapting curricula to achieve an optimal balance between technological and practical learning components. This research contributes to the theoretical understanding of digital transformation in tourism education while suggesting future research directions to evaluate the long-term effectiveness of hybrid learning models across various geographical and socio-economic contexts. The findings provide valuable insights for educational institutions, policymakers, and industry stakeholders in developing strategies for effective digital transformation in tourism education.

Keywords: Digital transformation, tourism education, e-learning, systematic literature review, hybrid learning

INTRODUCTION

Digital transformation has become a driving force reshaping various industries, including tourism. Technological advancements such as Artificial Intelligence (AI), Internet of Things (IoT), Big Data, and social media have created new opportunities and challenges for the tourism sector (Buhalis & Amaranggana, 2015). Tourist destinations are now promoted, accessed, and managed in different ways, demanding a workforce with digital competencies (Neuhofer, Buhalis, & Ladkin, 2015).

Tourism education plays a crucial role in preparing graduates who are adaptive to the evolving industry demands (Assaker, 2017). Digital transformation in tourism education encompasses the integration of digital technology into curriculum, pedagogy, and learning processes (Cantoni & Hjalager, 2015). This includes the use of learning management systems (LMS), development of interactive digital learning content, and implementation of innovative technology-supported teaching methods (Huang, Baird, & Chen, 2014).

The digital transformation in tourism education is driven by various factors. Government policies supporting technology integration in education, such as providing internet access and digital devices, represent one of the primary driving forces (European Commission, 2013). Additionally, the development of increasingly sophisticated and affordable new technologies also spurs digital transformation in tourism education (Gretzel, Sigala, Xiang, & Koo, 2015). Industry demands for workforce with digital competencies also serve as a significant driving factor (Law, Buhalis, & Cobanoglu, 2014).

However, digital transformation in tourism education also faces various challenges. Infrastructure limitations, particularly in developing countries, become a major constraint in implementing digital technology in education (Ali & Wood-Harper, 2020). The digital skills gap among educators and students also presents a challenge that needs to be addressed (Buhalis & Moldavska, 2022). Resistance to change from educators accustomed to traditional methods can also impede digital transformation (Cohen, 2017).

Understanding the driving forces and challenges of digital transformation in tourism education is crucial for formulating effective strategies to improve educational quality (Tussyadiah & Zach, 2017). This study aims to identify and analyze these driving factors and challenges through a systematic literature review (SLR). The findings are expected to provide a comprehensive understanding of the dynamics of digital transformation in tourism education and provide recommendations for stakeholders to enhance educational quality and prepare

competitive graduates in the digital era.

METHODS

This study employs a Systematic Literature Review (SLR) approach to identify and analyze the driving forces and challenges of digital transformation in tourism education. SLR was selected as it enables a systematic, objective, and comprehensive review of existing literature (Kitchenham & Charters, 2007).

Research Protocol

The research protocol was developed based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009) to ensure transparency and traceability of the research process.

Search Strategy

The literature search was conducted in November 2024 using prominent academic databases: Scopus, Web of Science, ERIC, and Google Scholar. The search keywords comprised combinations of terms relevant to digital transformation and tourism education, including: "digital transformation", "tourism education", "e-learning", "technology adoption", "drivers of digital transformation", "barriers to digital transformation", "challenges in implementing digital technologies"

Inclusion and Exclusion Criteria

The inclusion criteria for this review encompassed several key requirements for article selection. The study focused on peer-reviewed articles published in reputable academic journals and conference proceedings between 2019 and 2024, with English as the publication language. Content-wise, the selected articles needed to specifically address digital transformation within the context of tourism education, particularly examining the driving factors such as government policies, technological developments, and industry demands. Additionally, the articles were required to discuss implementation challenges, including infrastructure limitations, digital skills gaps, and resistance to change in the educational setting. Studies that did not meet these established criteria were excluded from the review to maintain the focus and quality of the analysis.

Selection Process

The article selection process was conducted in three stages:

1. Initial Screening: Preliminary screening based on titles and abstracts to identify potentially relevant articles
2. Eligibility Assessment: Articles passing the initial screening were assessed for eligibility through full-text reading to ensure compliance with inclusion and exclusion criteria
3. Final Selection: Articles meeting all inclusion criteria and not falling under exclusion criteria were selected for inclusion in the review

Data Analysis

Data extracted from selected articles were analyzed using thematic analysis to identify driving forces and challenges of digital transformation in tourism education. The coding process was conducted inductively, where themes were developed from the existing data. These themes were then grouped into two main categories: "Driving Forces" and "Challenges." The validity and reliability of the analysis were maintained through member checking and peer debriefing.

RESULTS AND DISCUSSION

Results

This study identifies and analyzes digital transformation in tourism education through a Systematic Literature Review (SLR). The findings encompass publication characteristics, major themes, and development recommendations, presented through narrative descriptions supported by relevant tables and figures.

1. Publication Characteristics

The analysis of publication characteristics reveals significant patterns in research distribution across temporal, geographical, and methodological dimensions. The majority of publications (75%) were concentrated in 2023-2024, indicating increased scholarly attention to digital transformation in tourism education. The 2021-2022 period contributed 15% of publications, while 2019-2020 accounted for 10%. This temporal distribution reflects the evolution from early adoption to more mature implementation phases of digital transformation.

Geographically, the studies demonstrated considerable diversity, with case studies spanning across Cyprus, Kazakhstan, Namibia, South Africa, and the Philippines. This

geographical spread revealed distinct patterns in digital transformation readiness and implementation. Advanced economies like Cyprus focused predominantly on pedagogical innovation and cutting-edge technology integration, aligning with Anastasiou's (2020) findings on successful e-learning adoption during the COVID-19 pandemic.

In contrast, developing nations such as Namibia and the Philippines faced more fundamental challenges. Cloete, Ndlovu, and Devi (2023) documented significant barriers in Namibia related to limited internet access and technological infrastructure, hampering e-learning effectiveness. Similarly, in the Philippines, despite efforts to integrate digital technology into curricula, accessibility and cost constraints remained primary obstacles for educational institutions (Deri, Zaazie, & Singh, 2023).

Methodologically, the research approaches showed a balanced distribution. Quantitative studies constituted 40% of the reviewed literature, emphasizing the importance of empirical measurement in evaluating digital transformation effectiveness. Qualitative approaches represented 35%, reflecting the need for in-depth understanding of implementation experiences and processes. The remaining 25% employed mixed methods, combining quantitative and qualitative approaches to provide comprehensive insights into the complexities of digital transformation in tourism education.

2. Major Themes Identified

The analysis revealed four primary themes emerging from the literature: Digital Transformation in Learning, Implementation Challenges, Development Opportunities, and Development Recommendations.

Digital transformation in learning emerged as a prominent theme, with 85% of articles discussing e-learning adoption during the pandemic, and 60% focusing on MOOC and LMS integration as distance learning solutions. Implementation challenges were consistently highlighted, with digital divide issues appearing in 70% of articles, followed by technological infrastructure limitations (65%), educator adaptation needs (60%), and practical learning difficulties (55%).

Development opportunities focused primarily on enhancing digital literacy, followed by increased learning flexibility and accessibility. The integration of emerging technologies like AI, IoT, and social media was identified as a significant opportunity for improving tourism education quality and relevance. These aspects appeared prominently across the literature,

demonstrating the positive potential of digital transformation in shaping the future of tourism education.

Development recommendations emerged as a crucial theme, with over 75% of articles emphasizing the need for robust digital frameworks, technology-based curriculum adjustments, and digital competency development for educators. The hybrid learning model was consistently recommended as an optimal approach, combining the advantages of digital learning with traditional methods.

Discussion

The analysis of driving forces and challenges in digital transformation of tourism education reveals several key insights that merit further discussion.

1. Driving Forces of Digital Transformation in Tourism Education

The findings demonstrate that digital transformation in tourism education is driven by interconnected factors. Proactive government policies in providing technological access and supporting technology integration into curricula serve as a fundamental foundation. This aligns with previous research (e.g., Ali & Wood-Harper, 2020; Chen & Liu, 2023) highlighting the crucial role of government support in accelerating technology adoption in educational institutions.

Rapid technological advancement, particularly in AI, VR/AR, and learning analytics, emerges as another significant driver of digital transformation in tourism education. These technologies enable the creation of more immersive, interactive, and personalized learning experiences. Wang & Li (2024) demonstrate that implementing VR/AR in tourism education can enhance student understanding and skill development.

Industry demand for graduates with digital competencies also serves as a significant driving force. Zaidan & Abulibdeh (2023) and Busulwa et al. (2024) emphasize that the tourism industry increasingly requires workforce capable of utilizing digital technology for various purposes, including digital marketing, data analysis, and online management. This demands educational institutions to adapt their curricula and learning methods to ensure graduates possess industry-relevant skills.

The enhancement of learning efficiency and effectiveness also emerges as a key driver of digital transformation. The utilization of LMS facilitates learning management, material delivery, and assessment, thereby improving the efficiency and effectiveness of the learning process.

2. Challenges in Digital Transformation of Tourism Education

Despite its potential, digital transformation in tourism education faces various challenges. Infrastructure limitations, particularly in developing countries, remain a primary constraint. Limited internet access, uneven distribution of digital devices, and lack of technical support can impede the implementation of digital technology in learning. Cloete et al. (2023) demonstrate how limited internet access in Namibia hinders online learning implementation.

The digital skills gap among educators presents another challenge requiring attention. Many educators lack adequate digital competencies to integrate technology into their teaching effectively. This necessitates training programs and capacity development initiatives to enable educators to utilize technology effectively in the learning process.

Resistance to change from some educators can also impede digital transformation. Keçi & Qosja (2021) found that some educators are reluctant to adopt new technologies for various reasons, including lack of understanding, time constraints for learning, or fear of change. Therefore, it is crucial to involve educators in the digital transformation process and provide necessary support to ensure their comfort with the changes.

High investment costs also pose a significant challenge in digital transformation. The procurement of hardware, software, curriculum development, and training requires substantial financial resources. This can be particularly problematic for educational institutions with limited budgets.

The findings suggest that successful digital transformation requires a balanced approach that addresses both technological and human factors. Educational institutions need to develop comprehensive strategies that consider infrastructure development, capacity building, change management, and financial sustainability. Furthermore, collaboration between government, educational institutions, and industry stakeholders is essential to ensure the effectiveness of digital transformation initiatives in tourism education.

CONCLUSIONS

This systematic literature review demonstrates that digital transformation in tourism education has become an imperative in the digital era. The findings reveal that driving forces such as government policies, technological advancement, industry demands, and learning efficiency improvements need to be optimally leveraged while addressing key challenges. These challenges vary significantly between developed and developing nations, with developed

countries focusing on optimizing technological utilization and pedagogical innovation, while developing nations grapple with fundamental issues such as infrastructure limitations, digital skills gaps, resistance to change, and investment constraints.

The study has important implications for stakeholders in tourism education, including policymakers, educational institutions, and industry players. Policymakers need to continue supporting digital transformation through adequate infrastructure development and relevant policies. Educational institutions must adapt to technological developments, integrate digital technology into learning processes, and enhance educators' digital competencies. The tourism industry should actively communicate digital skill requirements and collaborate in preparing work-ready graduates. By addressing challenges strategically and leveraging available opportunities, digital transformation can enhance tourism education quality and better prepare graduates for the digital era. Future research could focus on evaluating the long-term effectiveness of digital transformation initiatives and developing standardized assessment frameworks across various geographical and socio-economic contexts.

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