Adapting towards Digital Revolution: Strategies for Tourism Educators in Malaysia

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Abstract
The swift incorporation of digital technologies in the tourist industry has brought about a new paradigm in all facets of higher education offering tourism programs. The COVID-19 pandemic, a global crisis of unprecedented scale, has profoundly impacted tourist education, including learning spaces, teaching methodologies, graduates' job prospects, and curriculum development. These concerns impact tourism educators, who play a crucial role in transmitting information and skills during the teaching and learning process to prepare high-quality and competent graduates. This paper aims to identify the strategies for tourism educators in Malaysia to adapt to the impacts of the digital revolution in tourism education. The analyses have been driven into four adaptation strategies: enhancing the educators' understanding of the changing nature of tourism work, transforming the tourism educators' profile, managing tourism educators' technological knowledge and competencies, and upgrading digital infrastructure and faculty facilities. These recommendations are crucial as they provide a foundation for the respected parties to develop decisive strategies that align with the tourism educators' needs, abilities, and interests, thereby ensuring a successful adaptation to the digital revolution.
Keywords: Adaptation, Digital Revolution, Digital Competencies, Educators, Tourism Education.

Introduction
Industrial Revolution 4.0, or IR 4.0, is a global phenomenon that massively affects tourism. The dynamic nature of the tourism industry makes it no exception in responding to the evolving technological landscape, where digitalization has become a cornerstone of innovation and efficiency in its business activities. According to the Organisation for Economic Cooperation and Development (OECD), the tourism industry is already anticipating an extended role in digitalization, using various digital tools and platforms such as mobile access, virtual and augmented reality (VR and AR), the Internet of Things (IoT), service robotics and artificial intelligence (AI) (Organisation for Economic Co-operation and Development, 2021).

In fact, the aftermath of the COVID-19 pandemic has resulted in unpredictable manifestations of employment and economic growth in the tourism sector, compelling the industry to rapidly adopt digitization, which substantially changed the way tourism operates, is organized, produced, and created. The digital transformation, however, presents several challenges, including a shortage of workers with many new skills in this sector (World Travel and Tourism Council, 2022). Despite these challenges, the utilization of machine learning, task automation, and robotics has the capacity to result in substantial growth and development in the tourism sector, inspiring optimism and motivation for the future.

According to TalentCorp (2021), the number of unemployed graduates had risen by 22.5% to reach 202,400 at the end of 2020 compared to 165,200 in 2019, attributed mainly to the protracted uncertainty and difficult labor market conditions resulting from the COVID-19 pandemic. Education and training providers should not ignore this significant alarm and should play their roles as the supply side in the labor market to take necessary actions. The concentration should focus on the future supply of digitally skilled workers to the tourism sector and contribute to skill development in the present workforce. Several studies conducted by scholars have mentioned the need for future skills of tourism students and curriculum development, fostering digital aspects. Universities are required to adapt to digital technologies, new shifts in pedagogical methods, and implement innovative teaching and learning processes in response to the transformation (Kallou & Kikilia, 2021; O'Connor et al., 2023; Timoshenko, 2021; Torres, 2022).

As the students' skills development is essential, the above issues will significantly affect how tourism teachers adapt digital technology and develop appropriate mechanisms for quality digital-based teaching. Chen and Hsu (2022), discovered that the sudden transition in instruction had been implemented due to the COVID-19 pandemic without sufficient time for planning and preparation of teaching tourism in five (5) Asia-Pacific countries (Indonesia, Philippines, Taiwan, Thailand, and Vietnam). The study focuses on the effectiveness of online education by tourism teachers, requiring more time and strategies for the adaptability process to be achieved. Organisation for Economic Co-operation and Development (2021), further emphasized that the quality of responsiveness to the tourism industry's marketing, booking, and other platforms and automated systems is likely to be a key feature of education and training provision. Hence, this condition implies a need to promptly prioritize the curriculum enhancement for the tourism program and ensure that educators are adequately prepared and trained.

Recognizing the significance of education in the process of digitalizing the tourism industry, Malaysia has been actively implementing policies and strategies to support this goal. The Ministry of Higher Education (MOHE), through the Malaysian Qualifications Agency (MQA), is responsible for monitoring the national higher education quality assurance practices and accreditation. The agency took several initiatives to upgrade the standard of programs offered at the tertiary level to respond to the needs of IR 4.0 urgently. For instance, Malaysia Education Blueprint 2015-2025 (Higher Education) outlined ten theme shifts considering and representing Malaysia's higher education landscape. 'Globalised online learning' and 'transformed higher education delivery' are among the key thematic enablers to ensure digital literacy for graduates. In 2017, the Malaysia Qualifications Framework 2nd Edition (MQF2.0) was approved by the MQA Council Meeting to strengthen learning outcomes and

integrate skills of the 'Academic' sector and 'Technical and Vocational Education and Training (TVET)' sector. The five clusters of learning outcomes in MQF2.0 are (i) knowledge and understanding, (ii) cognitive, (iii) functional work skills, (iv) personal and entrepreneurial skills, and (v) ethics and professionalism. Most importantly, the revised qualifications framework specifically highlights the digital skills associated with "the ability to use information or digital technologies to support work and studies including sourcing and storing information, processing data, using applications for problem solving and communication, as well as ethics in applying digital skills" (Malaysian Qualification Agency, 2017).

Despite these initiatives, the pressure of requiring more effective adaptation strategies by both hospitality and tourism education (HTE) and the hospitality and tourism industry (HTI) appears in preparing the future workforce for the digital world (Adeyinka-Ojo et al., 2020). The commitment of educators is indeed important in supporting and fulfilling the aspirations of the nations in tourism. TVET tourism educators, in particular, need more understanding of the industry settings as they differ slightly from educators in other education systems. They focus on technical and professional training, emphasizing hands-on practice (Malaysian Qualification Agency, 2021). In fact, Malaysian TVET educators must have a one-month biannual staff industrial attachment, which ensures they stay up to date with industrial standards and work capabilities (Malaysian Qualification Agency, 2021). Besides, Azmi et al. (2018), confirmed that the exposure to IR 4.0 among hospitality and tourism educators teaching in Malaysian higher education institutions is minimal and requires improvement in digital pedagogy. In today's digital-infused tourism business and environment, the need to prepare tourism educators to adapt the digital pedagogy to conduct the current and upcoming curriculum design efficiently is certainly critical. Hence, the important gap in the research literature is a somewhat limited understanding of how the digital revolution impacts tourism pedagogy. Although several digital impact studies have been conducted, most of these are predominantly industrial in nature (Rahman et al., 2020; Carlisle et al., 2023; Kim et al., 2017; Thong et al., 2022; Zehrer & Mössenlechner, 2009). This posits a flaw in digital impact studies, especially those related to tourism pedagogy, which results in planned ideas not aligning with target groups' needs, powers, and interests. This study offers a conceptual explanation for one of the key areas of concentration in the digitalization of tourism: the potential adaptation methods among tourism educators in Malaysia in response to the digital revolution in the tourist sector.

Methodology
The development of adaptation strategies began with the analysis of related papers, followed by connecting the identified relationships between the impacts of the digital revolution and tourism education. During the analysis process, relevant articles were obtained from search engines, including Taylor & Francis, Science Direct, Sage Publications, and Emerald Publishing. Several keywords were used, such as 'digital revolution impacts on tourism education,' 'adaptation strategies toward online learning,' and 'educators' use of digital pedagogies.' A total of 122 articles were reviewed, but only 39 remained after the screening stage and were complemented with the relevant government and industry reports. A total of 64% of the selected articles were related to the context of hospitality and tourism education, while the remainder were linked to digital impacts in general. Table 1 presents the identified studies used to formulate the adaptation strategies on the digital revolution's impacts on tourism education.

Table 1
The selected studies used to formulate the basis of adaptation strategies.

Authors	Adaptation strategies highlighted
Adeyinka-Ojo et al. (2020)	Identifying the key digital literacy and employability skills required for industry and education, shifting the digital and pedagogical competencies.
Organisation for Economic Co-operation and Development (2021)	Understanding skills needs in the digital tourism economy; better information delivery on the skills shortages to education providers; policy considerations.
O'Connor et al. (2023)	Fostering the educators' technology, pedagogy, and context knowledge, improving ICT infrastructures and facilities.
Chen and Hsu (2022)	Fostering the educators' technology, pedagogy, and context knowledge.
Çınar (2020)	Transforming tourism educators' roles and profiles; insisting digital and pedagogy competencies; improving ICT infrastructures and facilities.
Luong and Kim (2020)	Fostering educators' psychological ability to innovate, improving ICT infrastructures and facilities, and providing governmental guidance and support.

Following this step, the paper highlights the impacts of the digital revolution on tourism education, and the study context is tourism educators' pedagogy, competencies, and educational infrastructures. Four adaptation strategies are then recommended: (1) enhancing the educators' understanding of the changing nature of tourism work, (2) transforming the tourism educators' profile, (3) managing tourism educators' technological knowledge and competencies, and (4) upgrading digital infrastructure and faculty facilities. These suggestions are believed to be appropriate for tourism educators' needs, interests, and abilities.

Impacts of the Digital Revolution on the Pedagogy of Tourism Educators
Tourism Educators in Malaysia

The growing number of higher education institutions offering tourism programs demonstrates the potential of the tourism industry as a significant economic contributor, necessitating the hiring of more tourism educators. There has yet to be an official record of the number of tourism educators in Malaysia. However, various hospitality and tourism education programs have been offered in many public and private higher education, whether academic or TVET sectors. Generally, based on the Guidelines to Good Practices (GGP) for academic workloads, the ratio of academic staff to students for social science is 1:30 for certificate, diploma, and advanced diploma; 1:25 for bachelor's degree; 1:20 for postgraduate diploma and masters; and 1:12 for doctoral degree. Nonetheless, it depends on the program standards and professional bodies related to the field. Currently, the program standards for hospitality and tourism are set to follow the GGP ratio of academic staff. Only for skill-based classes, the following ratio is 1:20 (Malaysian Qualification Agency, 2019). To ensure the quality of academic staff, tourism educators in Malaysia are expected to be competent in knowledge and skills of discipline and pedagogy. The quality of academic staff is an essential

component in assuring the quality of higher education (Malaysian Qualification Agency, 2018).

Impacts of the Digital Revolution on Tourism Pedagogy
Globally, the shift to online education has become a critical consideration of universities' overall strategic planning. The digital classes offer flexibility to the students and educators in facilitating the teaching and learning activities. Massive Open Online Courses (MOOC) and blended learning have become popular tools tourism educators adopt as delivery methods. Zoom, Google Meet, and Cisco's WebEx provide numerous advantages, but they vary depending on the features' effectiveness in meeting users' needs. O'Connor et al (2023), reported that the COVID-19 pandemic has pushed educators to use more tools and software for online teaching rather than learning management systems (LMS) only. Synchronous video conferencing is a popular digital technology due to the high degree of interactivity among participants. At the same time, the asynchronous method allows students to watch lecture videos whenever they like (Torres, 2022).

However, the features of online learning, especially during the COVID-19 pandemic, raise several concerns. For example, the nature of tourism and hospitality education demands that students engage in a certain level of practical learning. Online learning may be perceived as a negative overall experience for students in this field (Choi et al., 2021). The social relationships between student-student and student-instructor have decreased due to the intervention of technology during course delivery in tourism education (Lee et al., 2016). Integrating technology in course instruction and curriculum design is not limited to how it is used. It also suggests several creative learning approaches, such as active, project-based, and inquiry-based. A higher degree of readiness is a main concern in educational institutions when designing long-term strategies to switch from the traditional pedagogical approach (Oskam, 2018). Thus, educators and students must understand their roles and how technology can bring connections and emphasize good engagement, particularly in higher education settings.

Impacts of the Digital Revolution on Tourism Educators' Competencies
The educators must be able to conduct and teach the specific operational aspects used in the hospitality and tourism industry. Moreover, Adeyinka-Ojo et al (2020), declared that recent disruptive technologies such as artificial intelligence, virtual and augmented reality, robotics, and sharing applications have added complexity to the industry's digital landscape. Such technologies will need to be incorporated into future hospitality education curricula. Nonetheless, Govindarajan et al (2011), underscored that these technologies and digital applications can innovate rapidly, making existing skills obsolete instantly. Chen and Hsu (2022), in their study revealed that tourism educators are lacking in terms the knowledge to understand their learners, particularly the Tech-savvy Generation; they believed their knowledge of the unprecedented virtual learning environment was far from them, and adequate support and education training is needed for them to reduce the adaptation period about current technologies practices in education. Lugosi and Jameson (2017), also pointed out that some teachers perceived digital technology as "a distraction, and they felt less confident that students were paying attention to the teaching." These flaws will result in the making of incompetent graduates who were trained by teachers who lack proper knowledge of technology and digital pedagogy (Chen & Hsu, 2022).

Due to the digital revolution, Adeyinka-Ojo et al (2020), in their paper, have identified the blend of different digital literary and employability skills required by the hospitality and tourism industry in Malaysia. The employability skills (hard and soft skills); operational skills (e.g., Opera cloud services, booking reservation or systems); strategic skills (data analytics, social media analytics, user experience design, statistical package for social sciences); basic work skills (computer application packages)' and soft skills (problem-solving, team player, critical thinking, and interpersonal relationships) are listed (Adeyinka-Ojo et al., 2020). Hospitality and tourism technologies and digital applications, therefore, can be clustered into four key categories: end-user applications (e.g., Web 2.0, email communication, publishing, and design applications), industry-specific applications (e.g., computer reservation system and global distribution system), strategy-focused applications (e.g., project management software, big data, analytical software), and disruptive technologies (e.g., VR, AR, robotics) (Adeyinka-Ojo et al., 2020). These findings show an urgency for a paradigm shift in tourism education, especially educators' digital and pedagogical competencies.

Impacts of the Digital Revolution on Tourism Teaching Infrastructures
Accessing the digital platform for teaching and learning becomes a priority to enable the growth and expansion of digital development in education. Teaching and learning activities, such as quizzes, teaching videos, and online forums, are usually conducted using the learning management system (LMS)-based or other digital platforms or tools. Huda (2023), in her study, found that an extensive enhancement of online digital accessibility in Malaysia's higher education is necessary as internet stability was a major difficulty for learners. In a roundtable chaired by Times Higher Education titled "Creating International Hubs for Teaching and Research: Digital Transformation in Malaysian Universities," all panels, which are the leaders of Malaysian universities, agreed that digital transformation is not easy, with several aspects to consider including digital inequality, operational budgets, and transitioning traditional form lecture into digital teaching (Times Higher Education, 2020). O'Connor et al (2023), discovered in their study that limitations in IT infrastructure and network coverage led to frustration and technical difficulties in delivering their online teaching. The inability to synchronize infrastructures and technology in teaching and dependence on free tools are among the major problems educators and students face (O'Connor et al., 2023). Zhou et al (2020), pointed out that technical glitches, unavailability of required gadgets and equipment, surroundings, and lack of resources are causing turmoil due to the sudden shift of online pedagogy. In Finland, for instance, the Organisation for Economic Co-operation and Development (2021) reported concerns by travel companies about the technologies, access to key platforms, and digital ecosystems that are outdated and offered in higher education modules. Meanwhile, tourism TVET teachers face great stress, pressure, and anxiety as they are not adequately equipped with the necessary technology and internet access and can reshuffle their training strategies quickly. The quality of teaching will be severely affected if these challenges are not addressed.

Discussion
Effective adaptation strategies have become a crucial need due to the profound impacts of the digital revolution on tourism education. Although several researchers have discussed the issue, there is still a scarcity of studies focusing on tourism educators' sphere. This paper highlights several adaptation strategies aimed at tourism educators in Malaysia to narrow this gap.

Enhancing the Educators' Understanding of the Changing Nature of Tourism Work

The tourism industry is highly fragmented and heterogeneous, encompassing many sectors. Even though tourism was an early adopter of new technologies and platforms like offering tourism products and services through online bookings, today's sector has become more personalized through rapidly increasing digital platforms, systems, and tools (Organisation for Economic Co-operation and Development, 2021). The established and emerging digital technologies most likely to impact tourism work include online travel agencies (OTAs), AI and big data, service robots, and VR. Yedla and Ajoon (2022) stated that the COVID-19 pandemic changed the tourism industry regarding customer expectation, acceptance, and satisfaction, thus requiring a specific skilled workforce for a more sustainable business model. In the National Tourism Policy (NTP) launched on December 23, 2020, the Malaysian government outlined the "Smart Tourism 4.0", encouraging more travel companies and travel startups to utilize ICT, such as tourism apps and social media, to enrich travel experiences (Baharun, 2022). Megawaty Khie, the Google Cloud regional director, said that the travel industry in Malaysia must embrace personalized and secure digital services to foster the increasing number of consumers using digital travel services (Ismail, 2023).

The hospitality and tourism education providers should not ignore the industry's digital transformation. Adeyinka-Ojo et al (2020), claimed that the new sets of digital skills require awareness and attention from tourism educators to align what is taught in the classroom with the industry's needs. Besides, the Organisation for Economic Co-operation and Development (2021) suggests that better information on labor demand and skills shortages (present and future) should be delivered to the labor supply or education providers. To create more dynamic learning environments, Debetaz (2023) pointed out that educators should stay up to date with the latest advancements and emerging trends arising from IR 4.0. Since understanding and implementing technology are difficult, collaborative learning, industry-academia forums, sharing sessions, and industrial visits should be organized to strengthen networks and understanding of the digital revolution and its impacts on the tourism industry. It will further enhance the relationship between industry-academia as both are the critical stakeholders in tourism education looking benefits from each other.

Transforming the Tourism Educators' Profile

The digital transformation in tourism will produce new sets of skills for students. This phenomenon also leads to an inevitable change in the educators' profile (Çınar, 2020). Generally, Chernova et al (2023), explained that the analysis of modern educators' perceptions, expectations, and desires considering digitalization and the challenges of globalization demonstrate that their way of thinking extends far beyond purely as an instructor, teaching a curriculum and transferring knowledge. They put a lot of effort and initiative into upskilling and reskilling their skills to adopt new forms of pedagogy and exhibit multitasking as an employee for the success of higher education. Realizing the need to redesign the student-instructor relationship in digital educational settings, tourism educators need to turn their roles from instructor to facilitators (Çınar, 2020), which leads to the expansion of experiential and participatory learning as well as student-centered learning (Thiele et al., 2014). They are expected to design and conduct practical and interactive learning activities, which demand that teachers change their roles from traditional experts

into monitors and coaches (Qiu et al., 2021). In turn, the professional development of tourism educators will be more likely to have a new roadmap that serves as a structured plan for enhancing their digital competency and technology integration skills.

Managing Tourism Educators' Technological Knowledge and Competencies
Tourism educators are the focal point or enabler in teaching and learning, while technology is integral to the process. Most importantly, ensuring the readiness and preparedness of teachers to integrate digital technology into the tourism curriculum must be prioritized (Balula et al., 2019). Ali (2020) claimed that a sufficient understanding of knowledge in ICT and pedagogy, together with the provision of training and support, will ensure the teachers' readiness. The sudden shift from face-to-face education to online learning during the COVID-19 pandemic forced tourism educators to switch and change their roles, teaching methods and approaches drastically without proper guidance and training, thus causing vulnerability to the quality of education. Moreover, the transformation of tourism educators' pedagogical capacity cannot simply occur by connecting them with technology; it insists on digital competence, specifically using ICT for business and education (Çınar, 2020). The need of tourism teachers to foster their development of technology, pedagogy, and context knowledge (TPACK) was discovered by several researchers (Chen & Hsu, 2022; O'Connor et al., 2023; Wang, 2019) as that knowledge was significantly different before and amid Covid-19.

Reskilling and upskilling the knowledge and competencies of hospitality and tourism educators can be an excellent strategy to help them conduct online learning more effectively. More specific digital workshops, assistance from the tourism private sector to share their expertise, and preparation time given to the educators are essential to address the issue owing to the additional tasks, including new lesson plans and designing online teaching materials (Choi et al., 2021). Consequently, they can adopt the relevant, interactive teaching pedagogy, support work-integrated learning, and alternative teaching methods in producing the industry's expected graduates.

Upgrading Digital Infrastructure and Faculty Facilities
Higher education institutions must be digitally equipped, and students, faculty, and academics must be prepared to study, work, and teach using digital devices and techniques, thereby driving innovation and disruption (Khalid et al., 2018). Investments in the right and relevant information (IT) infrastructure and capabilities should be allocated by HEIs to improve their operations (Chen & Siau, 2012). The need to upgrade IT infrastructure, access relevant networks or systems, and purchase and provide important software in higher education institutions is necessary with a sound monitoring system and evaluation by the education ministry (O'Connor et al., 2023). Luong and Kim (2020), revealed that as part of the organizational conditions, school facilities are important to support the innovation of new tools, practices, technologies, or systems to improve educational quality in tourism. Their study also highlights the ability of macro-environmental factors like governmental guidance and support to create pedagogical innovations in today's demanding digital learning environment (Luong & Kim, 2020). Even though Malaysia, through MyDIGITAL, has provided various national initiatives, including boosting the usage of e-commerce, enabling connectivity, and improving digital learning facilities to achieve the Malaysia Digital Economy

Blueprint's vision, the most critical requirement is the Whole-of Nation approach to realize the benefits and overcome the challenges (MyDIGITAL Corporation, 2021).

Conclusion

The complexity of vital skills due to digitalization and changing trends impacting today's world becomes a big wheel to tourism education. Although integrating digital technologies in tourism brings many benefits to the growth of new business models, many things need to be done to resolve in an educational context, particularly the educators who are meant to be the most important agents of transferring knowledge and skills to students. It is suggested that deliberate adaptation should be intensified by focusing on the four main concerns: (1) enhancing the educators' understanding of the changing nature of tourism work, (2) transforming the tourism educators' profile, (3) managing tourism educators' technological knowledge and competencies and (4) upgrading digital infrastructure and faculty facilities. Policymakers, local leaders, and organization managers can use these strategies to produce more aligned adaptation strategies that meet the targeted community's needs, interests, and abilities.

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