

Research Paper

## Digital Future of the Global Hospitality Industry and Hospitality Education: Review of Related Literature

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**Abstract:** The hospitality and tourism industries are changing dramatically as a consequence of the application of information technology (IT) to managerial, and strategic and operational tasks. This is stimulated by the competition within the industry as well as the development of new, creative technological advancements. Digital revolution constitutes one of the most significant developments in the volatile business market. Hence, utilising digital technology is essential to maintain competitiveness and keep up with the changing world. Advancements of modern technology, has the potential to replace human labour with artificial intelligence and robotics. Thus, hospitality graduates need to be equipped with the right skills and abilities to meet the needs of the evolving hospitality industry. Further, they need to always upgrade themselves with the right competencies to thrive in the job market. With the goal of evaluating recent developments and technology advancements in the hospitality education and industry, this study analyses past research works in the field as well as theories of skill development, particularly for hospitality graduates. Using the content analysis method, the study examined previous research on how hospitality graduates can enhance their skills. Based on the findings, a conceptual framework for fourth-generation technological abilities was developed for the hospitality sector. The proposed conceptual framework can serve as a basis and guideline for future research efforts as well.

**Keywords:** Hospitality, education, industry, digital, future, global

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## Introduction

A new approach to human capital management has emerged in the wake of market forces such as globalisation, technological advancements, and other factors (Cheng et al., 2023). As these changes take place quickly and frequently, companies would need to ensure that their employees can adapt as quickly and frequently as well. There are a number of considerations that employers must look at. The first is to ensure employees are equipped with the right competencies that will be valuable to the business (Commeey et al., 2021). According to Lin and Wang, (2017), while new technologies have made it possible to communicate with people all over the world, they also have the potential to be disruptive because the constraints of distance is removed and the amount of work required is reduced.

In this regard, the hospitality industry and education is also changing drastically due to technological advancements. Essentially, hospitality graduates may not be equipped for the industry with the existing set of skills they have learned. As such, current and future hospitality students need to be exposed to and trained for the abilities of the fourth-generation technology as early as possible. Whenever there is a requirement for new skills, advancement of skills takes precedence (Kruss, 2021). The current hospitality education and cohort of graduates will all be affected in different ways by the rapid globalisation of the industry. For one, new sectors and businesses continue to spring up, traditional employment routes have been upended, and the delivery of goods and services has changed (Pappas, 2017). Stiff competition prompted by advancements in innovation, communication and inventiveness has necessitated new ways of learning and training requirements (Fiorini, 2011). Further, service delivery has become more complex and demand has risen for unique products tailored to various niche tourism markets that operate in a digitally-connected borderless setting.

Students in higher education institutions are expected to take advantage of a variety of learning resources found online to supplement classroom instruction and extracurricular activities. Additionally, employers must provide in-house training that emphasises the development of relevant knowledge, skills, and abilities so that businesses can compete in a global marketplace where rapid technological advancements are the norm (Buhalis & Amaranggana, 2015). Thus, it is even more imperative now than ever before to understand the industry's current abilities and to plan for the future.

Studies have shown that while smart technologies can reshape certain hospitality and tourism jobs, they can also make others redundant. Hence, colleges and universities must continuously fine-tune their hospitality courses to keep up with the everchanging industry requirements. According to Gretzel et al. (2015), digitalisation is now a primary focus in the higher education sector. New opportunities for both

social and economic advancements have been made possible by the digital revolution, notably in the field of hospitality training (Anwar et al., 2014; Mohamad Razak et al., 2022; Vandeyar, 2015). However, the utilisation of new digital tools in teaching and learning is yet to be fully realised. For now, teaching and learning still predominantly consists of passive communication with students, a high-level overview and visualisation of educational materials and ideas. Undoubtedly, a much more vivid and interactive teaching such as online learning can increase student satisfaction (Ajanovic, 2014). In this respect, this review will explore the digital future of the hospitality industry and hospitality education globally, based on relevant literature.

### **Literature Review**

The digital age has revolutionised various industries, including the hospitality industry. The hospitality industry has undergone significant changes in recent years due to advances in digital technologies. From online booking systems to mobile check-in and keyless room entry, digital technologies have transformed the way guest services are provided in hotels and resorts (Kim & Mattila, 2019).

According to Lin & Wang (2017), with this rapid development of digital technologies, the hospitality industry is undergoing a significant transformation, affecting various aspects such as marketing, operations, and customer experience. These changes have had a significant impact on the hospitality industry and the way that it operates (Kim et al., 2018; Lee, & Lee, 2018; Sigala, 2017). In response to these changes, it is essential for hospitality education to keep pace with industry developments and equip students with the necessary competencies and skills to thrive in the digital future of the industry. Hospitality education programs around the world have to reform to ensure that their graduates are equipped to meet the demands of a rapidly evolving industry (Sigala, 2020b).

This review of related literature examines the technological changes and trends taking place in the industry and its education sector, specifically on the competencies and skills hospitality graduates require in order to be successful in this new landscape. Various theories underpinning hospitality education and competency development are also explored to provide a theoretical foundation for understanding the development of competencies in hospitality graduates. Finally, a suggested conceptual framework for competency development in hospitality education will be presented to guide educators in evaluating and revising programs to effectively prepare graduates for the challenges of the industry's digital transformation. It is hoped that the review can provide insights and recommendations to hospitality educators and industry professionals on how to prepare for the digital future of the industry.

## **Evolution of Information and Communication Technology (ICT) in the Hospitality and Tourism Industry**

Information and communication technology (ICT) has had a significant impact on the hospitality and tourism industry. ICT has revolutionised various aspects of the industry, including customer service, marketing, operations, and overall business management (Kim et al., 2015). Some key ways in which ICT has influenced and transformed the hospitality and tourism sector are discussed next.

First and foremost, online reservations and booking. The growth of ICT has led to the rise of online reservation and booking systems (Buhalis & Law, 2008). Customers can now easily book hotel rooms, flights, rental cars, and other travel services through websites and mobile applications. This convenience has increased efficiency and accessibility for both customers and businesses.

Secondly, Global Distribution Systems (GDS). GDS are computerised networks that enable travel agents and other intermediaries to access and book travel-related services. According to Xiang et al. (2017), GDS platforms provide real-time information on availability, pricing, and itineraries, allowing travel agents to make bookings for their clients. This technology has streamlined the distribution process and expanded the reach of hospitality and tourism businesses (Buhalis & Law, 2008).

In addition, ICT has introduced the advanced Property Management Systems (PMS) that automates various tasks such as front desk operations, guest check-ins and check-outs, room assignments, billing, and inventory management. These systems streamline processes, enhance efficiency, and provide better control over hotel operations (Xiang et al., 2017).

Furthermore, ICT has facilitated the development of mobile applications that provide travellers with access to information at the touch of a finger, including hotel details, online check-in, concierge services, local attractions, and real-time updates (Gretzel et al., 2015). Mobile applications/technologies have become an integral part of the travel experience which enhanced communication between hotels and guests, making it easier to deliver personalised services. Hotels, airlines, and travel agencies develop mobile apps that offer features such as mobile check-in, digital room keys, flight updates, destination guides, and personalised recommendations (Kim et al., 2015). Smart devices, such as smartphones and tablets, have enhanced the overall guest experience by providing instant access to information and services.

In regard to big data and analytics, ICT has enabled the collection and analysis of vast amounts of customer data, which helps businesses personalise their services and marketing efforts. Ukpabi and Karjaluoto (2017) highlighted that, by analysing customer preferences and behaviour patterns, hospitality and tourism businesses can offer tailored experiences, targeted promotions, and loyalty programs to enhance customer satisfaction and loyalty. Big data analytics also helps hotels and tourism

companies make informed decisions, optimise pricing, identify market opportunities, and improve operational efficiency (Kim et al., 2015).

According to Sigala (2016) as well as Goh and Law (2012), ICT has transformed marketing strategies in the hospitality and tourism industry. Digital marketing techniques, including search engine optimisation (SEO), pay-per-click (PPC) advertising, and social media marketing, enable businesses to reach a wider audience and engage with potential customers in a more targeted manner.

In recent times, the Internet of Things (IoT) has revealed the potential to revolutionise the hospitality industry by connecting devices and systems to enhance guest experiences. It facilitates the integration of various devices and systems within the hospitality industry. Smart rooms equipped with IoT technology can offer automated controls for lighting, temperature, entertainment systems, and room service (Hua & Xu, 2019). IoT also enables effective energy management and operational efficiency, leading to cost savings for businesses and ensuring a seamless and comfortable stay for guests.

Additionally, with the rise of online platforms and social media, customer reviews and ratings now play a crucial role in the hospitality and tourism industry. ICT has made it easier for customers to share their experiences and opinions, influencing the reputation and decision-making process of potential travellers (Xiang et al., 2017). Businesses actively engage in reputation management strategies to monitor and respond to customer feedback. CRM systems powered by ICT enable hotels and tourism businesses to manage customer data effectively, track preferences, and offer personalised experiences. This technology also allows for targeted marketing campaigns, loyalty programs and guest recognition, as well as fostering of customer satisfaction and loyalty.

Lastly, virtual reality (VR) and augmented reality (AR) technologies have introduced immersive experiences in the hospitality and tourism sector. Travellers can virtually explore destinations, hotels, and attractions, aiding in their decision-making process. Hotels and travel agencies also leverage VR and AR to showcase their offerings, providing customers with a preview of their experiences (Egger, Gula & Walch, 2016). The rapid advancements of ICT have and continue to transform the hospitality and tourism industry, enhancing customer experiences, improving operational efficiency, and expanding business opportunities. Certainly, embracing and leveraging these technologies is crucial for businesses to stay competitive in the rapidly evolving digital landscape.

## **Digital Future of the Hospitality Industry**

Digitalisation has been the subject of much discussion in recent years. One of the main drivers of this transformation has been the ever-evolving customer

expectations. Consumers today expect a seamless digital experience throughout their entire customer journey, from booking to check-in and beyond. This has led to the development of a range of technologies designed to enhance the guest experience, such as mobile apps, self-service kiosks, cashless payment, chatbots and many more. Another factor is the development of new technologies such as artificial intelligence (AI) and the Internet of Things (IoT). These innovations are enabling hotels and other hospitality businesses to collect and analyse vast amounts of data, which can be used to improve the guest experience, increase operational efficiency, and drive revenue growth.

In addition, the recent COVID-19 pandemic has also accelerated the digital transformation of the hospitality industry. In response to the pandemic, many businesses have had to adopt new technologies and processes to ensure the safety of their guests and staff. This has included the widespread adoption of contactless payment systems, digital menus, and online check-in processes.

### **Hospitality Education in the Digital Age**

The digital transformation of the hospitality industry has also had a significant impact on hospitality education. There is an increasing demand for graduates with digital skills who can effectively navigate the changing landscape of the industry (Debnath & Chakraborty, 2019). Today's hospitality students must be prepared to work in a world where technology plays an increasingly important role. This has led to a shift in the focus of hospitality education towards digital skills and competencies. One area where this shift is particularly evident is in the use of technology in the classroom. Many education institutions now use digital platforms to deliver lectures and course materials in their hospitality courses, while others are using AR and VR technologies to provide immersive learning experiences.

Another area where hospitality education is evolving is in the development of new courses and programs focused specifically on digital skills. These courses cover topics such as digital marketing, revenue management, and data analysis, and are designed to provide students with the skills they need to succeed in a digital world. The COVID-19 pandemic has also had a significant impact on hospitality education. Many institutions have had to move their courses online, which has required them to develop new teaching methodologies and technologies. This included the use of online learning platforms, virtual classrooms, and digital assessment tools.

Technological advancements in the hospitality industry and hospitality education globally are rapidly evolving. Changing customer expectations, new technologies, and the COVID-19 pandemic are all driving this transformation. Hospitality businesses must be prepared to embrace these changes if they are to remain competitive, while hospitality education institutions must adapt their curricula to ensure that their graduates are well-equipped to succeed in a digital hospitality industry. The digital

future of the hospitality industry presents both challenges and opportunities, and those who are able to adapt and innovate will be the ones who succeed in the years to come.

### **Digital Technologies in the Hospitality Industry**

As stated earlier, the hospitality and tourism industry has been transformed by digital technologies in recent years. These technologies have been developed to enhance guest experience, improve operational efficiency, and increase revenue growth. The following are some of the major digital innovations employed in the hospitality and tourism sectors. Mobile apps are increasingly being used by hotels, airlines, and other hospitality businesses to provide a seamless guest experience. These apps can be used to book rooms, check-in, access hotel services, and provide guests with personalised recommendations. Also, self-service kiosks are becoming more common in hotels and airports, allowing guests to check-in, select their rooms, and make reservations without the need for staff assistance.

Furthermore, chatbots are being used by hospitality businesses to provide guests with 24/7 support and assistance. These bots can answer common questions, provide recommendations, and even make bookings. Similarly, contactless payment systems are becoming increasingly popular in the hospitality industry, allowing guests to pay for services and purchases without the need for cash or physical cards.

To add to this, AR and VR technologies are used by hospitality businesses to provide immersive experiences for guests. These technologies can be used to provide virtual tours of hotels, attractions, and destinations, and can even be used to simulate experiences such as scuba diving or skiing.

IoT is also another key digital technology. IoT is used in the hospitality industry to collect and analyse data, enabling businesses to optimise their operations and provide guests with personalised experiences. IoT devices can be used to track guest behaviour, monitor room conditions, and even adjust lighting and temperature settings as preferred by guests.

Lastly, artificial intelligence (AI) is used to improve operational efficiency and enhance guest experience. AI-powered chatbots can provide personalised recommendations and support, while AI algorithms can be used to optimise pricing and revenue management. These are some of the digital technologies being used in the hospitality and tourism industry today. As technology continues to evolve, we can expect to see even more innovative solutions designed to enhance the guest experience and drive growth in the industry.

### **Impact of Digital Transformation on Hospitality Education Globally**

The hospitality industry has been significantly impacted by the rapid advancements in digital technology in recent years. To prepare for the digital future, the industry

needs to adopt effective digital strategies, and hospitality education must keep pace with this changing landscape.

First and foremost, the digital transformation of the hospitality industry has become a significant topic of interest for scholars in recent years. According to Buhalis (2020), digital transformation involves the use of digital technologies to enhance customer experience, operational efficiency, and innovation. In his study, he found that technology adoption in the hospitality industry leads to an increase in operational efficiency, enhanced customer experience, and improved revenue generation. Some ways in which digital transformation has impacted the hospitality industry include online booking and reservation systems, digital concierge services, mobile check-in and check-out, and revenue management, among others (Buhalis, 2020; Xiang et al., 2017). Digital transformation has had a significant impact on the hospitality industry, and hotels that embrace digital transformation are likely to have a competitive advantage. By leveraging technology, hotels can improve their guest experience, increase revenue, and streamline their operations.

Secondly, the use of technology such as mobile apps, social media, and artificial intelligence (Cheng et al., 2023; Cai & Cardenas, 2016) has changed the way hotels and other hospitality businesses interact with their customers. For example, social media platforms like Facebook, Instagram, and Twitter have become important marketing tools for hotels and other hospitality businesses (Xiang et al., 2017; Chung & Koo, 2015; Wang et al., 2018). These platforms enable businesses to reach new customers, engage with existing customers, and promote their services. According to Gretzel and Yoo (2017), digital technology has changed the way customers make reservations, check-in, and pay for their stay. In their study, they found that customers who use mobile apps for hotel reservations have a higher level of satisfaction compared to those who do not. The impact of digital technology on the hospitality industry has been far-reaching, transforming the way businesses operate, engage with customers, and market their services. As technology continues to evolve, the hospitality industry will need to adapt to stay competitive and meet the evolving needs of customers.

Furthermore, digital marketing has become an essential part of the hospitality industry, with businesses leveraging social media, search engine optimisation, and other online platforms to reach customers (Kandampully et al., 2015). According to Sigala (2018), digital marketing is essential for hospitality businesses because it enables them to target their audience more effectively, improve their brand image, and enhance customer engagement. Digital marketing, such as social media marketing, has become an essential tool for the hospitality industry to attract and retain customers. According to a recent study by TrustYou, 95% of travellers read online reviews before booking a hotel, thus social media can be used to highlight positive

reviews and promote a hotel's amenities and services (Debnath & Chakraborty, 2019). By leveraging social media, search engine optimisation, content marketing, influencer marketing, email marketing, and digital advertising, hotels can improve their visibility, attract new customers, and increase revenue.

Given that the hospitality industry is facing a digital revolution, hospitality education must keep pace with the changing landscape. According to Liu et al. (2021), digital technologies have also impacted the way hospitality education is delivered. They found that digital technology has enabled educators to use innovative teaching methods, enhance student engagement, and provide a more immersive learning experience. Since digitalisation has become an integral part of the hospitality industry, hospitality students must be taught strong technology skills to succeed in the work market (Park & Kim, 2018).

Sigala (2018) also highlighted that hospitality education programs are now including courses on topics such as digital marketing, revenue management, and data analytics to prepare students for the industry's changing demands. Further, AR and VR technologies have revolutionised the way students learn by providing immersive and interactive experiences (Cheng et al., 2023). For example, students can use VR to virtually visit a hotel or restaurant, allowing them to experience the environment and practice their skills in a safe and controlled setting. The use of online learning, simulation and gaming, mobile learning, AR and VR, and data analytics has provided students with new and innovative ways to learn and practise their skills, preparing them for successful careers in the hospitality industry.

Finally, online learning has become an integral part of hospitality education, with many institutions offering online courses and programs. According to Wang et al. (2018), online learning is an effective method for hospitality education because it allows students to learn at their own pace, provides flexibility, and enhances access to education. This, however, requires the adoption of effective digital strategies and the use of innovative teaching methods (Loo & Chua, 2016; Rahman & Lee, 2022; Yang & Du, 2019). Further, online learning offers flexibility, access to a wide range of programs, interactive learning, cost-effectiveness, ongoing professional development opportunities, technology skills, industry-relevant curriculum as well as interactive learning (Lee et al., 2017; Su et al., 2018; Xie & Yang, 2018).

### **Competencies and Skills Required by the Hospitality Industry**

According to Martin (2019), the hospitality industry is a highly competitive and dynamic field that requires a wide range of competencies and skills from its workforce. These competencies and skills can be divided into three main categories: technical skills, interpersonal skills, and business skills (Baum, 2007). Some of the key competencies and skills required by the hospitality industry are discussed next.

Technical skills are the specific knowledge and abilities required to perform a particular job or task within the hospitality industry. Examples of technical skills required in the hospitality industry include: food and beverage preparation and service, room management and housekeeping, event planning and management, revenue management and financial analysis, digital marketing and social media management, and data analysis and reporting (Walton, 2018). This requires a strong understanding of digital technologies and the ability to use them effectively.

Next is interpersonal skills. Interpersonal skills are the abilities needed to effectively interact with guests, co-workers, and managers. These skills include: communication and active listening, customer service and problem-solving, teamwork and collaboration, conflict resolution and negotiation, and cultural sensitivity and diversity awareness (Balakrishnan & Pullman, 2016). One of the most important competencies required by the hospitality industry is the ability to provide excellent customer service. This includes traits such as empathy, active listening, and problem-solving, as well as the ability to communicate effectively with guests. Effective communication skills are essential in the hospitality industry, as employees must be able to communicate with guests, colleagues, and superiors. This includes skills such as listening, speaking, and writing, as well as the ability to use digital communication tools such as email and social media.

Lastly, business skills are the competencies required to understand and manage the financial, marketing, and strategic aspects of the hospitality industry. These skills include: business development and strategic planning, budgeting and financial analysis, sales and marketing management, project management and leadership, and innovation and creativity (Okumus, 2016). In addition to the technical, interpersonal, and business skills mentioned above, there are also some specific competencies that are highly valued in the hospitality industry. These include adaptability and flexibility, emotional intelligence and empathy, attention to detail and time management, problem-solving and critical thinking as well as multitasking and stress management (Martin, 2019).

In line with the competencies discussed above, it can be inferred that the hospitality industry requires a broad range of competencies and skills from its employees. By cultivating a diverse set of technical, interpersonal, and business skills, hospitality professionals can effectively navigate the complexities of the industry and deliver exceptional experiences for guests. To succeed in this sector, employees must be able to balance soft skills such as customer service and communication with technical skills and a strong understanding of business principles.

### **Competencies and Skills Required by the Hospitality Industry after COVID-19**

The COVID-19 pandemic has had a significant impact on the hospitality industry, and as a result, there has been a shift in the competencies and skills required by

employees in the sector. Some of the key competencies and skills required by the hospitality industry in the 21st century, especially after COVID-19, include the following.

Firstly, digital literacy. With the increasing adoption of digital technologies in the hospitality industry, employees must have strong digital literacy skills. The pandemic accelerated the adoption of digital technologies in the hospitality industry, which necessitated employees to acquire quickly digital literacy skills. This includes the ability to use digital communication tools, manage online reservations and payments, and provide virtual experiences for guests.

Furthermore, the COVID-19 pandemic spotlighted the importance of health and safety in the hospitality industry. This led to employees being trained for proper hygiene and sanitation practices to prevent the spread of infectious diseases, as well as new protocols for social distancing and contactless service. Employees must be able to follow strict protocols to ensure the safety of guests and colleagues, including wearing personal protective equipment (PPE), cleaning and disinfecting surfaces, and enforcing social distancing measures.

With increased stress and anxiety during the pandemic, hospitality employees have had to demonstrate strong emotional intelligence skills to support guests and colleagues. This includes empathy, active listening, and the ability to manage their own emotions and stress levels. As the hospitality industry is focused on providing personalised and empathetic services, employees must have strong emotional intelligence skills including the ability to read and respond accordingly to guests' emotions, as well as the ability to manage their own emotions in high-pressure situations.

As the hospitality industry is fast-paced and highly susceptible to external factors, such as the recent pandemic, hospitality employees must be able to adapt to new challenges and bounce back from setbacks. The worldwide COVID-19 outbreak compelled the hospitality sector to adjust to highly volatile circumstances and confront unprecedented hurdles. Thus, employees must be resilient and adaptable, able to pivot quickly to changing circumstances and find innovative solutions to novel problems. This requires resilience, grit, and a growth mindset.

Moreover, with increasing concerns about the environment, the hospitality industry is also propelled to place a greater emphasis on sustainability. Hospitality businesses are increasingly embracing sustainability principles and finding ways to reduce their environmental impact. In this regard, employees must be knowledgeable about sustainable practices and be able to communicate them effectively to guests as well as being able to implement them in their work, such as reducing waste and energy consumption.

In addition, in a highly competitive market, hospitality employees must be able to think creatively to provide unique and memorable experiences for guests. The pandemic has created new challenges for the hospitality industry, requiring

employees to be creative and innovative in their approach to problem-solving. This includes the ability to develop new products and services, the ability to innovate and improve existing ones as well as finding new revenue streams. Moreover, with the growing number of travellers from diverse backgrounds, employees must be able to work effectively with people from different cultures and backgrounds. This requires cultural competence and the ability to communicate effectively in different languages.

Lastly, cross-functional skills. During the pandemic, when many hospitality businesses had to operate with reduced staff as a result of revenue loss, employees were expected to work across different functions and departments. This required a broad range of skills, including customer service, operations, marketing, and finance. The pandemic necessitated the need for employees to be adaptable, resilient, and able to navigate new challenges and opportunities. As the industry continues to evolve, employees must be able to acquire and master new skills to stay competitive and provide exceptional service to guests. Table 1 provides a summary of the key differences in hospitality competencies before and after COVID-19.

**Table 1.** Key competencies of the hospitality industry before and after COVID-19

<b>Competencies</b>	<b>Before COVID-19</b>	<b>After COVID-19</b>
Health and safety	Important, but not a top priority	Top priority, with a focus on hygiene, sanitation, social distancing, and contactless service (Ho & Xie, 2020; Sigala, 2020a).
Digital literacy	Increasingly important, but still evolving	Essential for communication, marketing, and revenue management (Gretzel et al., 2015; Huang & Liu, 2019).
Emotional intelligence	Important for personalised service	Even more important for empathetic service in times of anxiety and stress (Zhu et al., 2022; Khanna & Parwani, 2016).
Resilience	Important for fast-paced industry	Even more important for adapting to change and bouncing back from setbacks (Yang & Wang, 2022).
Sustainability	Growing concern	Increased emphasis on sustainable practices (Heesup, 2021).
Creativity	Important for differentiation	Even more important for developing unique and innovative offerings (Buhalis, 2020).
Multiculturalism	Important for diverse guests	Still important, but with a focus on domestic travellers (Wang & Fesenmaier, 2004).

## **The New Normal and Expectations of Hospitality Graduates Post-pandemic**

Conventional education was significantly affected by the pandemic, and learners today, expect academic institutions to support them in adapting to the constantly changing education landscape around them (Bhargava et al., 2022; Krishnamurthy, 2020). Due to high standards and requirements for new hires, higher education institutes (HEIs) must do their part to helping their students meet these standards. The workforce is set to receive a new cohort of workers, generation Z, people who were born between 1995 and 2009. Studies show that they are more productive if they work in an environment where they feel more appreciated (Sigala, 2021b). Existing students and recent graduates should have realistic expectations for any re-alignments; however, the sector anticipates them to be knowledgeable about strategic planning and to provide the most upbeat and constructive response (Tesone & Ricci, 2012).

In the wake of the pandemic, there will be less emphasis on job specialisation and more importance on multitasking as a means of maximising productivity (Kaushal & Srivastava, 2020). Standards and criteria for safety and hygiene must also be understood by future employees (Hu et al., 2021) and individuals need to be more prepared to be innovative (Bucak & Yigit., 2021). While mastery of interpersonal, communication, and teamwork skills is an ongoing process, prospective workers will be required to possess, at the very least, the basics as part of their own self-directed professional growth (Gössling et al., 2020).

## **COVID-19 Impacts and Implications for Advancing and Resetting the Hospitality Industry and Education**

COVID-19 not only affected hospitality and tourism education through the sudden shift to virtual classrooms and online learning; it also expedited the long overdue transition of educators into online teaching and the widespread adoption of existing digital trends and developments in education (Krishnamurthy, 2020; Sigala, 2020b). Additionally, COVID-19 brought on a massive, hasty worldwide life experience of expedited (technology) transformation that enabled us all to clearly comprehend the real importance of e-learning with no or little change, review earlier evaluations of digitalisation (Goh & Okumus, 2020); and re-evaluate one's own aspirations, capabilities, and means of transformation. COVID-19 was a formidable transformative catalyst that necessitated a unique perspective to existing issues. In keeping with this, hospitality education must not only adapt to the multifaceted and multidimensional hospitality industry norms post-pandemic but also offer fresh ideas for improving businesses.

Academic institutions (universities) are operating in uncharted waters at a time where the tourism and hospitality industries are experiencing tremendous

transformations. As Nesamalar et al. (2022) highlighted, it is crucial to focus on the changes that have taken place and are currently emerging in order to reassess how hospitality and tourism education should reform to deal with the long-awaited changes. The main stakeholders in the academic scene may want to redesign hospitality training and rethink their “business model” to suit the futuristic vision. The hospitality sector is evolving faster than ever before. Considering the effects of COVID-19 on the hospitality sector, it is therefore necessary for hospitality education to help their students to acquire the right competencies so that they can confidently take on the industry. To prevent the shortage of skilled workers, hospitality students should undergo apprenticeships, trainings, or industry experiences in the real world such as hotels, so that they can grasp the competitiveness and challenges of the hospitality profession.

To meet the ever-evolving industry competencies and requirements, the curricula and the mode of delivering must be modified, enhanced, and revised accordingly. For instance, competencies such as “health/safety protocols, hospitality in the era of social distance, resilience, creativity-innovation, soft and communication skills, technology literacy, remote working, and skills for managing, leading, and collaborating with virtual teams and staff” (Yang & Du, 2019, p. 6). To thrive in the digital capitalist system and create value in society, hospitality businesses need to show accountable and sustainable leadership (García-Morales et al., 2021). Therefore, graduates must be capable of identifying and addressing (business) issues using rational thinking with a purpose. Graduates who aim to be leaders in their field must be able to ask the appropriate questions, in addition to giving the right answers in order to rebuild effectively. In this regard, graduates should be able to create, interpret, and evaluate AI algorithm decisions based on both corporate effectiveness and ethical principles (Berezina et al., 2019). Relevant competencies and skills must be re-embedded and strengthened in hospitality courses.

The standard today is to have a workforce with a variety of socioeconomic backgrounds, geographic locations, and occupational backgrounds. According to Adeyinka-Ojo et al. (2020), hospitality professionals can emerge from a diverse range of industries, academic fields, and stages in their professional/educational careers as work mobility increases and information becomes quickly outdated, necessitating periodic improvements and updates. To accommodate the many requirements, experiences, ambitions, and limits of this diverse population of students, hospitality educators need to continuously upgrade their business models.

### **Hospitality Education for Today**

All facets of hospitality and tourism education have long been virtualised. Several parties have also started exploring with “uberising” their professional expertise (Collins et al., 2020) by means of skipping publishers and educational institutions

to publish books, conduct studies through huge open online classes or start scientific journals (Sigala, 2020b). The epidemic hastened the adoption of technology and allowed every educator to witness first-hand the advantages of virtualising their expertise and experiences (for example, apprenticeships, seminars, workshops, and digital learning), as well as its limitations and restrictions (Ahmad & Scott, 2019). With this rising trend of virtualisation, we are not too far away from academics giving lessons on “a pay-as-you-go” basis connecting and linking to different institutions of higher education and academic networking (Sigala, 2021a). At the same time, academic ranks, analytics, and algorithms will continue to advance and expand in applications in order to regulate the prestige, interest, demand, and “prices” of these “celebrity” freelancing academics.

Hospitality and tourism institutions must give heed and keep abreast with the evolving knowledge economy, while simultaneously, addressing a slew of unprecedented challenges that the digital age will engender. For instance, future student enrolment may be reduced and unpredictable, competitors are just a click away, virtual accessibility of education programs, an independent student market and immigration restrictions. To stay relevant and survive, institutions need do more than just digitise their operations and services (Govindarajan & Srivastava, 2020). A personalised, open, continual, and flexible instructional approach appears to be required in this new educational landscape. The new normal necessitates that institutions review and update their whole strategic plan. In order to accomplish this, an assessment of the following would be beneficial in helping them redesign and reset their organisational strategies.

**Value proposition.** The ability for “students to learn what they need, when they need it, from whom they need it from, and how they need it” (Sigala, 2021a) can be made possible via education-as-a-service (pay-as-you-go) models which do not require regular and defined academic semesters. Given that learning can occur anywhere (e.g., by way of networks, profession, or forums), perhaps a special competency which institutions need to capitalise on to stay competitive is accreditation of learning.

**Revenue model.** By accelerating the achievement of learning objectives, the reduction of expenses associated with meeting learners’ demands, the development of quicker revenue streams, as well as cutting superfluous expenditures and overhead can be attained, as highlighted by Collins et al. (2020). This can be carried out by modifying educational programs, redefining the function of the education industry, and hiring academics who enhance the value and appeal of educational activities, and merging technological partnerships for funding, innovation, and learning (for instance, virtual interactive laboratories and instructors).

**Delivery model.** Digitalisation has affected all aspects of education, including instruction, evaluation, and corporate participation through virtually and hybrid methods that support in-person involvement. Technology advancements (mixed

reality, AR) will not only change instruction but also all other aspects of education (García-Morales et al., 2021; Sigala, 2021a). Thus, it would be imperative to redesign and reform all forms of student services and experiences using new technologies; for example, career management and planning powered by AI can give students individualised learning advice.

### **Related Theories and Models**

The review of related literature on the digital future of the global hospitality industry and hospitality education is underpinned by several theories. Several theories could help explain hospitality graduate competency development. Some key theories that help explicate the digital transformation of the hospitality industry are discussed next.

The Innovation Diffusion Theory is sociological in nature, meaning it relates current ideas, products, or practices through a social media over time (Greenhalgh et al., 2004; Rogers, 2003; Valente, 2010). The theory suggests that the adoption and diffusion of innovations are influenced by various factors, including perceived relative advantage, compatibility, complexity, trialability, and observability (Buhalis & Law, 2008; Van de Ven et al., 1999). In the context of the hospitality industry, this theory can help explain the adoption and diffusion of digital technologies, such as online booking platforms, mobile apps, and self-check-in kiosks.

The Technology Acceptance Model (TAM), a well-known paradigm, emphasises the presumed benefits and simplicity of a technology as factors influencing its acceptance (Davis, 1989; Taylor & Todd, 1995). TAM is a renowned philosophical framework that clarifies how people embrace and use new technology (Legris et al., 2003; Venkatesh & Davis, 2000). According to Venkatesh et al. (2003), the perception of utility alongside perceived usability are factors that affect an individual's intent to use modern technology (Agarwal & Prasad, 1999). In the hospitality industry, this model can help explain the factors that influence the adoption and use of digital technologies by both employees and customers.

Competency-based education (CBE) is a learning approach that focuses on the demonstration of specific skills and knowledge, known as competencies, rather than traditional classroom-based instruction (Education Commission of the States, 2019). It emphasises practical applications and real-world problem-solving. Oroszi (2020) stated that this theory posits that competencies are observable and measurable behaviours that are linked to successful job performance. The theory explores the relationship between competency-based education and problem-based learning, discussing how the two approaches can be integrated to highlight the benefits of competency-based education (Redding, 2016). In the context of developing hospitality graduate competencies, this theory can help explain how the development of specific competencies, such as communication, teamwork,

leadership, and technical skills, can lead to improved job performance and career success (Commission on the Future of Graduate Education, 2020).

The Curriculum Theory is another suitable theory to explain hospitality graduates' competencies. This theory considers the design, development, implementation, and evaluation of educational programs (Marsh, 2014; Tyler, 2013). In the context of hospitality education, the Curriculum Theory can be used to understand how hospitality programs are designed to develop specific competencies in graduates. It can explain how hospitality programs are designed to provide students with the knowledge, skills, and attitudes required to be successful in the industry. For example, hospitality programs may include components such as food and beverage service, front desk operations, revenue management, and marketing. These courses are designed to provide students with the technical skills required to perform their job duties effectively (Apple, 2013; Pinar, 2012). The Curriculum Theory can also explain how hospitality programs are designed to develop graduates' soft skills, such as communication, teamwork, leadership, and problem-solving" (Smith, 2004) as well as how hospitality programs can be evaluated to ensure that they are effective in developing graduates' competencies (Tyler, 2013). This may include assessing the learning outcomes of specific courses or the overall program, as well as soliciting feedback from industry partners and graduates to identify areas for improvement.

The Dynamic Capability Theory (DCT) emphasises a firm's ability to adapt and innovate in response to changing environments (Helfat & Peteraf, 2009; Winter, 2003; Zollo & Winter, 2002). DCT is a theoretical framework that focuses on an organisation's ability to adapt and respond to dynamic environments through the development and deployment of dynamic capabilities (Teece et al., 1997). In the digital future, this theory suggests that hospitality businesses and educational institutions must cultivate dynamic capabilities that enable them to embrace technological advancements, adopt innovative practices, and remain agile in the face of evolving digital trends (Wang, & Ahmed, 2007). Learning and knowledge creation are the fundamental aspects of DCT. Additionally, Eisenhardt & Martin (2000) contended that organisations must foster a culture of continuous learning, knowledge sharing, and exploration. Learning processes can help organisations acquire new knowledge, develop new competencies, and enhance their ability to adapt to changing circumstances. This theory has been influential in strategic management and has been applied in various contexts to understand how organisations can achieve and sustain their competitive advantage in dynamic environments.

Next, the Human Capital Theory is an economic framework that focuses on the role of education, training, skills, and knowledge in enhancing individual productivity and economic outcomes. It views individuals as human capital assets and emphasises the importance of investing in human capital for personal and societal development (Hanushek & Woessmann, 2012). Human capital refers to the knowledge, skills,

abilities, and attributes that individuals possess and can contribute to economic production (Becker, 1993). It encompasses both formal education (such as degrees and certifications) and informal learning through work experience and on-the-job training. This theory suggests that investing in education and training can lead to the development of human capital, which can lead to improved job performance and career success (Heckman, 2000; Schultz, 1961). In the context of hospitality graduate competency development, this theory can help explain how investing in hospitality education can lead to the development of specific competencies that are valued by employers and can lead to improved job performance and career success.

The Resource-Based View (RBV) theory suggests that a firm's competitive advantage is based on its unique resources and capabilities (Barney, 1991; Grant, 1991; Wernerfelt, 1984). The RBV theory is a strategic management framework that focuses on the internal resources and capabilities of a firm as the primary sources of sustainable competitive advantage (Barney, 1995; Peteraf, 1993). Helfat and Peteraf (2003) suggested that in the digital future, this theory suggests that hospitality businesses and educational institutions need to develop digital resources and capabilities that enable them to leverage technology effectively, analyse data, and adapt to changing market dynamics. In the context of the hospitality industry, this theory can help explain how digital technologies can enable firms to develop and leverage their unique resources and capabilities, such as customer data analytics, mobile apps, and social media engagement.

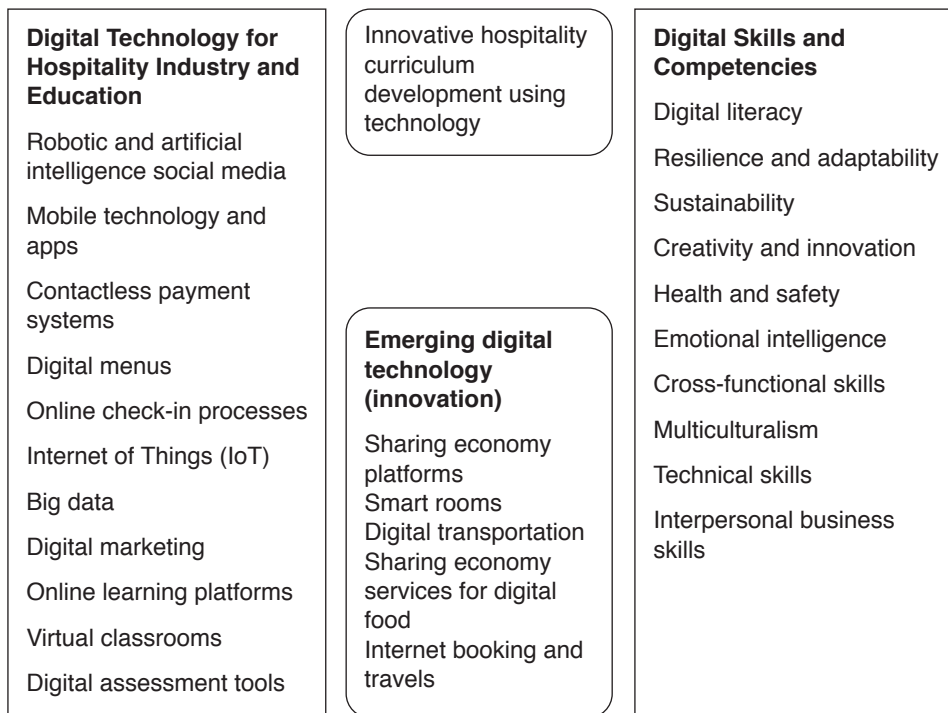
According to Molm (2019), the Social Exchange Theory posits that social interactions involve a process of exchange, where individuals seek to maximise their rewards and minimise their costs (Cropanzano & Mitchell, 2005). Emerson (1976) suggested that learning occurs through observation, imitation, and modelling of others (Homans, 1958; Thibaut & Kelley, 1959). In the context of the hospitality industry, this theory can help explain how digital technologies can enable firms to build and maintain relationships with customers through personalised and interactive services that provide rewards and benefits. In relation to hospitality graduate competency development, this theory can help explain how graduates can develop competencies by observing and modelling the behaviours of successful hospitality professionals, as well as by participating in experiential learning opportunities, such as internships, simulations, and case studies.

These aforementioned theories provide a theoretical foundation and valuable insights into the theoretical underpinnings of the digital future of the hospitality industry and hospitality education. By considering these theories, researchers and practitioners can gain a deeper understanding of the implications and strategies for leveraging technology, enhancing customer experiences, and developing competencies to thrive in the digital era. These theories can also provide a theoretical foundation for understanding how hospitality graduates develop competencies that are valued

by employers and that contribute to their career success. By using these theories, educators and researchers can develop and test strategies for enhancing hospitality graduate competency development, such as experiential learning opportunities, personalised learning plans, and competency-based assessments.

### Conceptual Framework

The current paper offers a discussion of concerns affecting the hospitality and tourism industry and education today and highlights a paradigm shift in thinking and the design of technology-driven hospitality and tourism curricula. Notably, this review has pinpointed the essential competencies and technological abilities needed by the hospitality and tourism industry. The findings are conceptualised in a contemporary technological framework for the design of hospitality and tourism curricula (Figure 1).



**Figure 1.** Conceptual framework for competency development in hospitality education for the digital era

This conceptual framework is expected to be useful to both hospitality and tourism instructors and managers in this highly dynamic industry. Although the

present generation is sometimes called “digital natives”, and the next generation may be exposed to advances in technology, it does not guarantee they will have the essential competencies to handle the technical and operational components of a fully computerised hospitality establishment. Thus, this framework can serve as a guide for hospitality education programs in developing and accessing competencies in their students. By providing a well-rounded education that develops these competencies, students will be better prepared for success in the hospitality industry.

### **Research Approach**

The literature review was carried out using content analysis. Content analysis is used to analyse and interpret the content of various forms of communication, such as text documents, images, videos, social media posts, and more. It involves systematically examining the characteristics, themes, and patterns within the content to derive meaningful insights and draw conclusions (Law et al., 2018). According to Adeyinka-Ojo et al. (2020), content analysis is quite helpful when analysing a variety of literary works and a big number of articles. This method was used to analyse literature related to “the digital future of the hospitality industry and hospitality education globally”, to identify key themes and trends. In reference to hospitality and tourism research, content analysis is commonly employed (Fathiyah et al., 2019).

Scholarly works published in journals with a focus on hospitality, tourism, and contemporary technology were used as references for the literature review. A single search engine, Google Scholar, was used to search large databases like Web of Science, Scopus, Taylor and Francis. According to Law et al. (2018), these are the biggest search engines and online databases. This process is in line with earlier studies (Adeyinka-Ojo et al., 2020; Law et al., 2018) that used several databases to examine data for analysis.

In addition, keywords searched included digital change, artificial intelligence, technology for robotics, the sharing economy, augmented and virtual reality (AR), and digital competencies. These approaches were based on earlier research that combined related phrases (Adeyinka-Ojo et al., 2020; Fathiyah et al., 2019). The current review supports the findings of previous studies on digital platforms in the hospitality and tourism industry and education innovations (Leung et al., 2013). For this analysis, the internet database search yielded 125 journals with 355 articles, which were supplemented by industry publications. Due to the study’s emphasis on adapting current ideas of abilities in utilising technology, technological advancements, and competencies for employment in increasingly digitised economies and evolving HTE environment. a deductive approach was adopted.

## Conclusion

The focus of this literature review is on how hospitality graduates can strengthen their technological competencies in meeting the ever-evolving needs of the hospitality industry in recent times and in the future. Emphasis needs to be placed on developing competencies that have not been previously prioritised to ensure new graduates are prepared to enter a digital labour market. Global digitalisation transformations are on the rise and rapidly evolving, and this has significant implications for both the hospitality industry and education. Literature suggests that digital technologies are transforming the way tourists experience and consume hospitality services, and are also changing the way hospitality businesses operate and compete. Digital technologies offer new and innovative ways to educate future hospitality professionals, equipping them with the necessary competencies to thrive in the industry. Moreover, digital technologies are revolutionising hospitality education, with the emergence of online learning, virtual reality, and gamification.

Employment prospects is a persistent problem that higher education institutions will continuously face. Every student, regardless of circumstance, course, or manner of study, are engaged in this lifelong process. The advent of new technologies, economic downturns, industry demand and various external factors all contribute to the ongoing changes in the labour market. In the past, education and capacity training provided by HEI and industry used to be adaptable and unlimited. In order for HEIs to remain competitive and to enhance graduate employability, emerging and future competencies have to be incorporated into the curriculum design and/or implementation. This means educators, institutions, and organisations have to rethink of their educational content.

Additionally, the academia and industry (stakeholders) must collaborate to work on the requirements of the digital workforce and also deliberate on relevant changes for the curriculum of hospitality management education. Partnerships between HEIs and industry players could provide a better understanding of the labour market's demand-side and supply-side dynamics and marginalisation. Together with the support of all parties involved, revision of the HEI curricula will bear fruit in the long run as it boosts graduate employability and enhances responsiveness to the industry's demands and needs.

The theoretical implications of these changes are significant, as they prompt a shift in the way educators think about teaching and learning, as well as highlight competencies that hospitality graduates need to succeed in a rapidly changing industry. The Curriculum Theory can provide a useful framework for designing and delivering hospitality education that prepares graduates for the digital future of the industry. Practical implications for the hospitality industry include investing in digital technologies and providing training to employees, while hospitality

educators need to incorporate digital technologies and experiential learning into their curriculum. Overall, the literature highlights the need for a collaborative effort between the industry and academia to prepare for the digital future of the hospitality industry and the need for ongoing research to better understand the challenges and opportunities in this field.

### **Practical Implications**

Practically, hospitality businesses and HEIs need to invest in digital technologies to remain competitive and relevant. This investment should be made in areas such as data analytics, artificial intelligence, mobile technology, and social media. Personalisation continues to be a key driver of customer satisfaction and loyalty. Thus, hospitality businesses and HEIs need data analytics to understand their customers and students better and offer personalised experiences that meet their individual needs and preferences.

Moreover, the digital transformation of the hospitality industry and education requires a skilled workforce. Therefore, there is a need to invest in skill development programs that equip employees and students with the necessary digital skills and knowledge. Collaboration is key to the success of digital transformation in the hospitality industry and education. Given this, collaborative ecosystems that bring together hospitality businesses, educational institutions, technology companies, and other stakeholders to share knowledge, resources, and expertise are the way forward.

Finally, hospitality businesses and HEIs need to integrate online and offline experiences to provide a seamless and holistic experience for customers and students. This requires the use of technologies such as mobile apps, virtual reality, and augmented reality to enhance the physical experience. These practical implications highlight the need for hospitality businesses and HEIs to embrace digital transformation and leverage technology to improve their competitiveness, customer satisfaction, and operational efficiency.

### **Theoretical Implications**

Theoretically, this study contributes to the existing literature on Competency-based Education (CBE), a theoretical framework that emphasises the development of specific competencies and skills required for success in a particular industry or occupation. In this context, hospitality education needs to adopt a competency-based approach that focuses on the development of specific competencies that are relevant to the hospitality industry. These theoretical implications highlight the importance of developing a set of competencies that are relevant to the current and future needs of the hospitality industry and are aligned with the resource and capability requirements of hospitality businesses. In short, competency-based education that

emphasises the development of specific skills and knowledge is critical to the success of hospitality graduates in the dynamic and rapidly changing hospitality industry.

The study also contributes to the Curriculum Theory. It relates to the developmental, implementation, and evaluation of educational programs, and it provides a framework for understanding how competencies are developed and assessed within a given educational context. The Curriculum Theory provides a theoretical foundation for the development of competencies for hospitality graduates that are relevant, meaningful, and aligned with the needs of the industry. This requires a systematic and intentional approach to curriculum design, implementation, and evaluation that takes into account the context, content, process, and outcomes of the educational program as well as provides a framework for developing competencies that are grounded in theory, research, and practice which can enhance the employability and lifelong learning potential of hospitality graduates.

Similarly, the Technology Acceptance Model (TAM) provides a theoretical framework for understanding users' acceptance and adoption of new technologies. Hospitality businesses and education institutions need to consider the factors that influence users' acceptance of digital technology, such as perceived usefulness, ease of use, and social influence. TAM can be used to understand the factors that influence the adoption and use of digital technology in the hospitality industry and education. This model highlights the importance of usefulness and how easy it is to use these technologies adopted.

These theoretical implications highlight the importance of developing a set of competencies that are relevant to the current and future needs of the hospitality industry and are aligned with the resource and capability requirements of hospitality businesses. In short, competency-based education that emphasises the development of specific skills and knowledge is critical to the success of hospitality graduates in the dynamic and rapidly changing hospitality industry.

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