



Research article

Lack of IT and digital marketing professionals in hospitality: is it education's fault?

Jianwei Qian^{a,*}, Pearl M.C. Lin^b, Rob Law^c, Xue Li^a^a Alibaba Business School, Hangzhou Normal University, China^b School of Hotel and Tourism Management, The Hong Kong Polytechnic University, China^c Faculty of Business Administration, University of Macau, China

ARTICLE INFO

Keywords:

IT professionals
Digital marketing professionals
Hospitality education
Curriculum updating
Career orientation

ABSTRACT

Information technology (IT) and digital marketing are perceived as the driving forces for promoting the development of the hospitality industry in a competitive market. However, there is a global shortage of workers to fill related positions, which hinders the sustainable growth of this industry. Thus, a qualitative thematic approach was adopted in this study to analyze textual data from experts to explore the reasons behind this shortage. Through careful design and analysis, three parties were identified as key generators, including education, industry, and staff/students. Meanwhile, the specific causes made by each party were presented to provide a detailed analysis of the issue. The findings are aimed to help solve the education and human resource issues in the hospitality industry. Nevertheless, the findings could have been more detailed if a follow-up interview was conducted after the thematic analysis.

1. Introduction

Contemporarily, the wide spread use of technology has been a key development that will continue to advance toward more sophisticated forms in the years to come (Ferrari et al., 2009). This trend of technological development is bound to dramatically change industries such as the hospitality industry. Thus, equipping hospitality students of all levels with the technological competencies required in the industry is a necessity. Meanwhile, interaction with extensive technology applications has enabled the hospitality industry to become knowledge-intensive in recent years (Hallin and Marnburg, 2008). To keep up with the latest development, hospitality education, as the main media to cultivate future staff for the industry, must be evaluated to check whether its curricula and course offerings can satisfy this demand, followed by an update on the design of the curriculum and the course.

In today's market, the hospitality industry faces fierce competition and must prioritize customers in order to make progress. The hotel staff is pivotal in facilitating the fulfillment of positive outcomes in light of customers' satisfaction and hotels' overall profitability. However, as one of the rapidly developing industries throughout the world, hospitality encounters serious issues related to recruiting and retaining adequate and qualified employees (Im, 2011; Ashgar et al., 2021), especially high-performing ones (Khan et al., 2021). Large numbers of part-time

staff, low educational competence among staff, and a high turnover rate constitute the status quo in the industry (Underthun and Jordhus-Lier, 2018), and this situation demonstrates the employee problem from another perspective. Thus, hospitality education, the primary channel to train future hoteliers, always falls into the critique target by the industry and customers, as they believe that hospitality programs fail to offer what the industry truly requires of its prospective staff (Griffin, 2021). Educators argue that doing so is not their responsibility, but is that of the industry, which should be the major reason why this phenomenon arises (Wen, Li, & Kwon, 2019).

This kind of debate on what causes the lack of sufficient IT and digital marketing staff now extends to the topic of the present study. For one thing, hospitality institutions have realized the importance of technological competencies for their students and the industry; the IT staff is known to play a crucial role in hotel operations (Nyheim et al., 2005). Therefore, institutions have commenced to offer technology-related courses since then. The industry is still concerned about the severe deficit of qualified technological staff (Lugosi and Jameson, 2017). The industry does not think that institutions have neither offered enough courses to improve students' abilities nor have adequate technology labs to enable students to practice what they have learned in class, thereby hindering the overall development of the industry.

* Corresponding author.

E-mail address: 821223168@163.com (J. Qian).<https://doi.org/10.1016/j.heliyon.2022.e12002>

Received 25 April 2022; Received in revised form 3 October 2022; Accepted 23 November 2022

2405-8440/© 2022 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

On July 18, 2019, Adjunct Professor Max Starkov from New York University posted on an online panel that hospitality human resource experts estimate that in North America alone, approximately 100,000 vacancies are available in the IT and digital marketing departments of hotels. This leads to the slow application of the latest technology in the industry and simultaneously stifles the technological innovation (Starkov, 2019). The question of whether the lack of proper technology education in hospitality schools should be responsible for this labor shortage was also raised. The debate is ongoing, which merits further scholarly attention to address the issue. Thus, the present study attempts to answer the major research question: why does the hospitality industry lack technology or digital marketing staff? Specifically, the first sub-question is 'what practitioners think of the lack of related staff in hospitality,' and the second one is whether it is solely the hospitality education that leads to the issue. After the implementation of the study, three objectives can be realized: (1) outline the actual reasons leading to the examined phenomenon; (2) shed light on what should be done next to improve the situation; and (3) contribute to solving the education and human resource issues in the hospitality industry.

2. Literature review

2.1. Competencies and education for hospitality students

For the past 30 years, academics and practitioners have been growingly interested in identifying the competencies that hospitality graduates should possess (Suh et al., 2012). According to the findings of previous studies, skills in hospitality are usually categorized into entry-level and middle-level skills for management; such categorization affects the hotel staff's career progression at various stages (Kay and Russette, 2000). In other studies, these skills are classified as generic and specific (Nelson and Dopson, 2001; Dopson, 2005). Entry-level skills or generic competencies are abilities that hospitality professionals of all levels should acquire, whereas middle-level skills or specific competencies refer to the abilities required in performing operational functions of hotels. From the industry's standpoint, hospitality education should concentrate on preparing students to become employable by educating them to master the aforementioned skills required by the hospitality industry (Hodges & Burchell, 2003). However, when graduates become hoteliers, their actual ability frequently fails to meet the expectation (Christou, 2002; Fraser, 2020).

Industry expectations play a critical role in shaping curricula for hospitality education, but considerable differences exist in terms of key variables. For example, leadership and interpersonal skills are emphasized in certain studies (Kay and Russette, 2000; Nelson and Dopson, 2001; Christou, 2002). By contrast, an in-depth understanding of human resource management, analytical skills, and financial assessment abilities are verified in other studies to be the key factors for professional success in hospitality (Kay and Moncarz, 2004; Mayo and Thomas-Haysbert, 2005). Meanwhile, coupled with corporate social responsibility, especially environmental responsibility, studies validate that the curricula should focus on sustainability and green practice-related abilities (Johanson et al., 2011; Mayburry and Swanger, 2011).

Certain studies suggest that serving the industry should not be the ultimate objective of hospitality education, as these scholars believe that the glove-fitting education program that aims to foster industry ready graduates is vocational, rather than educational, which is not beneficial for the long-term development of students (Lugosi and Jameson, 2017; Chytiri et al., 2018). This standpoint is echoed in another study, which raises caution against the excessive training of hospitality students for practical skills just because hotels prefer to employ graduates with abundant skills in hotel operations and management (Jiang and Alexakis, 2017). In this way, hotels can save cost and time by offering training to their employees. Apparently, it is not what a well-rounded education should aim at. Therefore, recent studies recommend that hospitality education should educate students to become capable citizens with

general knowledge, in addition to industry specific knowledge (Son-nenschein et al., 2017; Sigala, 2021).

2.2. Information technology (IT) and hospitality education

The application of IT in hospitality can be dated back to the early 1970s. After that, various ITs were implemented in the industry to help improve hotel performance (Melian-Alzola et al., 2020). No unequivocal opinion concerning the function of IT in the success of the hospitality industry exists. The larger the number of services or products hotels offer, the greater their reliance on IT (Piccoli and Torchio, 2006). IT is multi-functional in the hospitality context, which goes far beyond daily room management. For example, IT enables human resource managers to efficiently handle training and develop reward programs (Okumus, 2013); it also helps revenue managers to acquire accurate recommendations about prices to improve hotel profitability (Squires, 2008; Ezzaouia and Bulchand-Gidumal, 2022); and most importantly, IT facilitates hotels to do well in online marketing and consequently attract and retain customers (Bilgihan et al., 2014).

Most hospitality programs consider technological knowledge a separate discipline and offer a course specifically teaching students a broad overview of technologies adopted in hotel operations. That is because technology is perceived to be beyond the scope of hoteliers and that a general understanding is sufficient for the daily operation (Dopson, 2005). Therefore, in the initial stage of technology education in the field of hospitality, only a few institutions were found to offer IT-related content, and the scope of teaching was quite limited and frequently lagged behind industry practice (Khatri, 2019). Accompanying the wide application of technology in hotel management, studies have begun to uncover the detailed competencies required by such a development; website design and management, e-business knowledge, information-sharing skills, and so forth are found to be pivotal for future hoteliers (Dopson, 2005). Therefore, many programs have now integrated these technology-related elements into every course of hospitality education (Szende, Catafamo, & Upenja, 2019). However, whether educators can successfully foster the development of students' technological skills is still questionable for multiple reasons.

2.3. Summary of the review

Evidently, a dilemma exists in the current hospitality education. That is, most studies affirm that identifying and meeting industry competencies is what hospitality education should do, but some studies differ by indicating that it is not beneficial for the long-term and holistic development of hoteliers. The industry and the academia have realized the importance of IT for hospitality, and certain measures have been incorporated in education to improve students' knowledge in this area. However, such an education is not effective. Thus, the number of qualified IT and digital marketing talents remains lacking throughout the world. In one study, Andrew (1984) anticipated that three main reasons could lead to the failure of hospitality education in imparting adequate technological knowledge to students, including insufficient resources, teachers' limited knowledge in IT, and a lack of industry experience. However, no other studies attempt to examine the reason why hospitality education does not exert sufficient efforts in improving students' competencies in IT. Thus, the industry still lacks huge numbers of qualified employees in related areas.

Many recent studies have been conducted in the area of hospitality education pertaining to IT, but most of them focus on the use of IT to enhance students' learning outcomes (Patier, Kensbock, Ma, Cox, 2017; Goh and Wen, 2020; Adeyinka-Ojo, Lee, Abdullah, & Teo, 2020). It indicates developing qualified IT application ability in the industry is being overlooked to a certain extent. Thus, it is of importance to investigate whether it is education's responsibility to cause such an issue from practitioners' perspective. Based on the aforementioned discussion, conducting such a study is necessary to bridge the current research gap to

a certain extent. Moreover, resolving education and human resource issues has implications for academia and industry.

3. Method

3.1. Research design

To answer the research question, a qualitative approach was adopted in the study. The qualitative design allows researchers to collect useful and robust data for determining the reason why a particular phenomenon exists in the social world (White, 2007). The research framework is shown in Figure 1, which starts from research gap identification in the previous two sections, to theme generation via thematic analysis and the final presentation of findings and discussions. Through this process, the research question can be addressed.

3.2. Data source

A recent discussion from the website Hospitality Net was evaluated to be the appropriate data source for this qualitative study. This website has a section titled 'Hospitality Net's World Panel,' which aims to offer a thought-leadership platform where opinion leaders from the academia and the industry can share their perceptions on crucial issues impacting hospitality operation. Whenever a discussion topic is raised by the panel-champ, a group of selected experts is invited to share their comments on this particular topic.

Until now no clear evidence demonstrates that opinions or attitudes which are the major elements of a qualitative study are distributed normally (Marshall, 1996). Hence, this study selected the judgment sampling technique to find the appropriate participants for the study. It means that the most productive samples were involved in this process to help address the research question. After Professor Max Starkov raised the question mentioned in the introduction section in *Hospitality Net*, 17 experts from Europe and North America participated in the panel and commented on the issue from their own perspectives. Europe and North America are two regions where the hotel industry developed early. Thus, experts from these two regions are appropriate choices for the study. Among the participants, four are university educators, and the rest are mainly from various consultancy companies offering technology and digital marketing advice to hotels. Many of them used to be managers of various hotels throughout the world and are now dedicated to improving hotel performance through the use of technology and the resultant improvement of revenue. Such a group of experts can guarantee the

Table 1. Profiles of experts the panel.

No.	Sex	Position	Base
1	Female	Marketing professional in digital tourism	Italy
2	Male	Chaired Professor	France
3	Male	Adjunct Professor	United States
4	Male	Associate Professor	United States
5	Male	CEO of a travel consultancy company	Italy
6	Male	Entrepreneur & business developer	Italy
7	Male	Chief Evangelist of a hotel consultancy company	United States
8	Male	Executive Vice President of a hotel technology company	United States
9	Male	Professor	Switzerland
10	Male	Partner of a hotel technology company	France
11	Male	Director of a hotel consultancy company	United States
12	Male	Managing director of a hotel consulting company	Canada
13	Male	Consultant of travel & hotel digital marketing	Canada
14	Male	Founder of a digital consultancy company for tourism	Canada
15	Male	Co-founder of a travel technology company	United States
16	Male	CCO of a hotel IT company	United Kingdom
17	Male	Director of client services in hotel technology company	United States

representation of opinions that reflect the authentic situation of the hospitality industry. Hence, the development level of the hotel industry in Europe and North America, together with the diversified background of the experts, significantly enhances the credibility of the study. Table 1 presents the profiles of the experts in the panel.

3.3. Analytical method

All texts from the post were downloaded from the webpage <http://www.hospitalitynet.org/panel/125000014.html> to form the dataset of this study in October, 2019. The dataset comprises 17 posts and 3,603 words from the source. Thematic analysis is a research tool within the scope of descriptive qualitative methodologies and is mainly adopted to identify, analyze, and report patterns in meaning within the examined data set concerning the investigated research phenomenon (Nowell et al., 2017). Thus, thematic analysis was performed on the collected dataset to capture their obvious and hidden meanings regarding the reason why

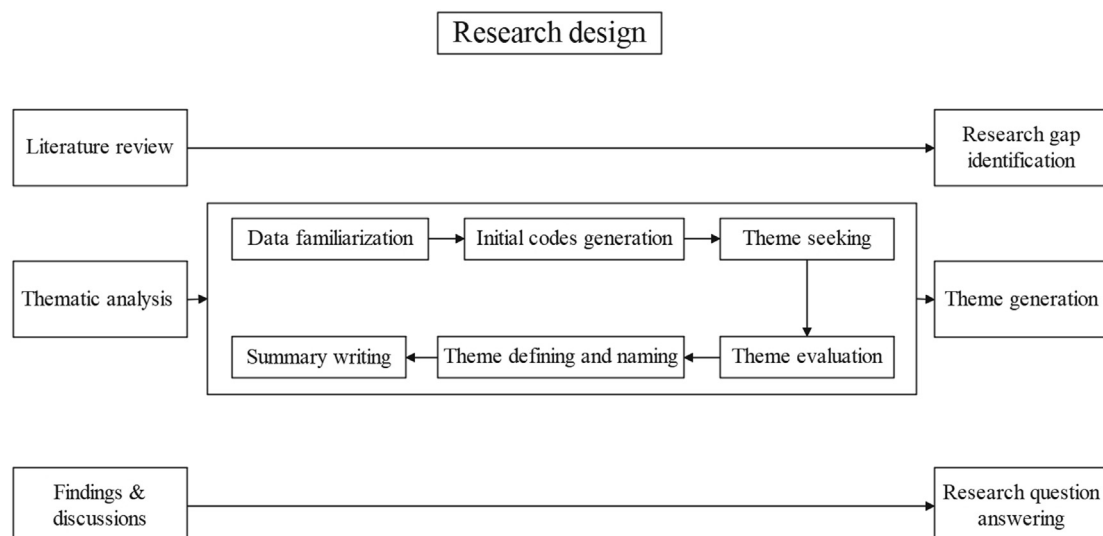


Figure 1. Research design.

hospitality lacks technology and digital marketing staff. The thematic analysis in the study followed the procedure of Braun and Clarke's work (2006). Their proposed procedures include the researcher's familiarization with the textual data, generation of the opening codes, look for themes, evaluation of identified themes, defining and naming of confirmed themes, and summary preparation. As the overall number of words and texts was relatively small, manually conducting the texts was more appropriate than using computerized techniques, which are frequently utilized to explore large quantities of textual data. In the beginning 'familiarization' step, the researchers repeatedly read the textual data to gain a holistic understanding of the data. In line with this, the researchers identified the statements that can be used to illuminate the research phenomenon. The identified statements were then examined to extract the essence of the hospitality context, which laid the foundation for the final grouping of themes. This process was also conducted iteratively by researchers to ensure a good classification of emerging patterns in data. Finally, a composite summary was derived to answer the research question. To ensure the correctness of the analysis, two researchers manually conducted the analysis separately first and compared their results later. If any discrepancy emerged, the third researcher would be invited to make the final decision.

4. Findings and discussions

After the aforementioned analytical procedure, three parties were identified to be responsible for the phenomenon: education, industry, and students/staff. Meanwhile, multiple factors affected these three parties' attitudes and behavior toward technology. The result is displayed in Figure 2, and each factor was investigated in the subsequent part of this section.

4.1. Education

4.1.1. Outdated course material

Hospitality education aims to adequately prepare candidates who are willing to enter the hospitality industry. Similar to other professions in the business industry, hospitality education offers a specific skill set utilized in the hospitality context in addition to general business knowledge (Li and Li, 2013). However, the course taught at hospitality institutions is outdated. Regarding the adoption of IT-related content, an expert mentioned that most of what hospitality students knew about the

industry came from textbooks published in the early 2000s, leading him to raise the question:

How can we expect to obtain new ideas out of them if we keep lecturing on Search Engine Optimization, GDS (Global Distribution System), and Tour Operators?

Knowledge, such as search engine optimization and GDS, is basic in hospitality, but may be too generic for current students because they were raised and born in the Internet era. They are believed to be immersed in an Internet world and are equipped with basic IT competencies; thus, what educators teach is not only out of date but also cannot arouse students' interest. The consequence is that what they learn at school cannot keep up with the radical development and expansion in IT tools available for hoteliers.

4.1.2. Difficulties in effecting the change of the curriculum

Institutions are aware of the aforementioned situation and sometimes are willing to make certain changes to better educate their students. Contrary to educators' attitudes toward modifying the curriculum, dilemmas exist regarding making such modifications. Therefore, the curriculum adopted by hotel management schools is not always current or relevant to digital marketing. The expert from NextGuest Digital presented:

Changing a university-level curriculum requires governing approvals with the likes of an academic review committee, a board of agents, accreditation board, and even state filings, plus faculty cooperation and coordination.

Owing to such hurdles, educators may refrain from taking any action until the curriculum becomes mainstream. Therefore, the cumbersome checks and balances in education sometimes creates a problem for itself and hinders the process of knowledge upgradation. Moreover, many educators who are unwilling to embrace and reform their curriculum, effecting the change in the curriculum is rather difficult.

4.1.3. Lack of sufficient preparation

The first indication of such inefficiency is educators' ignorance of various digital elements in their courses. Some of them still follow the conventional way to teach and even do not update their knowledge from the industry. An entrepreneur cited his example of asking an internationally renowned university educator if she had altered the teaching content to differentiate between hotel revenue managers and digital marketing managers:

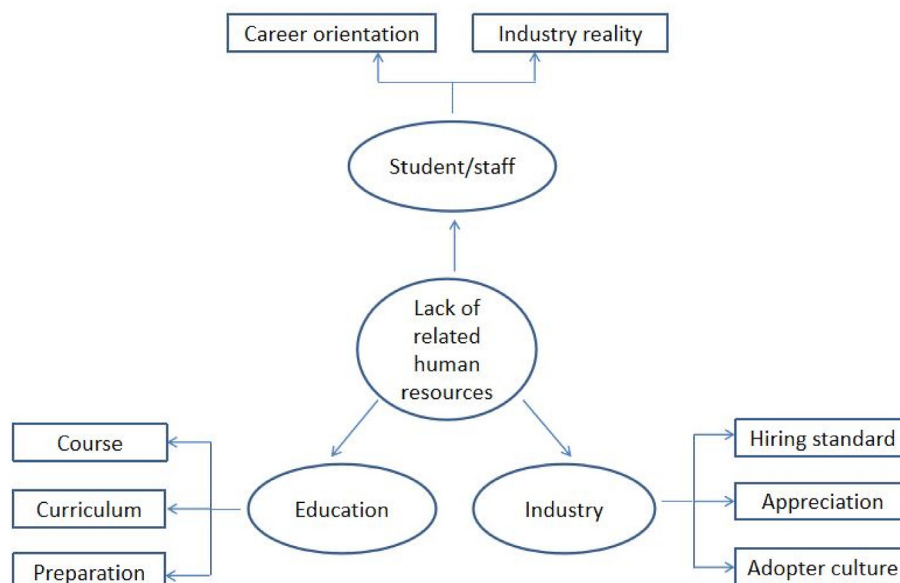


Figure 2. Factors leading to the examined phenomenon.

The lady replied, asking me if I knew what a revenue manager is.

The response from the educator simply indicated that she did not clearly know what the role of someone responsible for digital marketing, distribution, and evaluation of online performance was. Thus, students taught by such educators may not acquire the knowledge they need to apply in their hospitality roles.

Lack of sufficient preparation can also mean the shortage of time and resources for educators to address the issue. Educators are faced with heavy pressure from work and life, and most of them cannot allocate adequate time and money to learn new technologies (Adukaite et al., 2016). Such a difficulty is bound to lower the education quality in technology education for hotel students. As commented by a director of a hotel management consultancy about the reality:

It is challenging for hotels to keep up with these innovations, even with a robust IT department. How can educators be expected to do so when they neither have the time nor budget to attend shows, such as HITEC (Hospitality Industry Technology Exposition & Conference) or HTNG (Hotel Technology Next Generation)?

Moreover, technology in hospitality undergoes a significant change even within a one-year period, creating further trouble for hospitality educators to keep their course content updated.

4.2. Industry

4.2.1. Improper standard of hiring

Some experts question the standards that hotels use to recruit IT personnel. IT is, by nature, technical and complicated, which may not be easy for hospitality educators to teach and for hospitality students to master (Chan et al., 2020). Thus, most hospitality students are unable to become experts in IT after graduation. Hence, as suggested by the expert:

Hotels do not employ people to be their engineers who have been educated at a hotel school ... What we need is to recruit people with IT skills first. Then, the role of a hotel school is to offer a crash course on what hospitality is. How it works and what are the processes? Similar to a Hospitality 101 for IT professionals.

The hiring standard for IT and digital marketing professionals in hotels merits in-depth consideration. That is, whether an IT major with extra training in hospitality knowledge or a hospitality student equipped with basic IT knowledge better accommodates the working requirement for hotel IT staff.

This idea is also confirmed by another expert from the field of revenue management. As current hotels are multi-functional, human resource managers in hotels should widen their range to select staff, and hospitality-focused schools must not become the sole source of their talent pool. The expert made an analogy, as shown below:

Do BMW or General Motors hire their commercial/IT experts from an engineering educational institution?

Therefore, it demonstrates what hotels should do, which is to employ the right staff from the right school for the right position. Merely focusing on hotel schools as the source of human resources may be a critical factor in causing the deficit in technology professionals.

Although certain hotels have realized that they should open technical positions to students from that major, another problem has emerged. An industry expert pointed out:

Are salaries for those positions on par with what other industries offer?

4.2.2. Inadequate appreciation for IT professionals

Compared with other businesses, hotels do not highly value staff development and retention because they are worried that the money they invest in training new staff may become valueless owing to the high turnover rate, and the thought “what if we train them and they leave” has

become a common concern among hotel managers. Following this ideology, they treat IT professionals in the same way. Accordingly, low pay and inadequate investment in technology have become common practices in hospitality.

... inadequate investment in technology and bad pay, no wonder good technical staff runs kicking and screaming into the arms of complementary industries, such as retail, where their skill sets and work ethics are highly appreciated.

Another common phenomenon is that hoteliers do not intend to explore modern technology in addition to the basic ones that appeared in the industry a long time ago. This attitude exists among many hotel managers, as illustrated by a marketing professional in tourism:

It still very often happens to hear hotel managers blaming the online world as the source of their own ills.

This statement reflects that this group of hoteliers does not regard hospitality as an e-commerce business, although hospitality is now fully embraced by various types of technology. Given that hotel managers do not highly stress the importance of technology, they will not invest much in recruiting IT professionals. As a result, qualified IT or digital talents do not devote themselves to hospitality. Hence, as summarized by one participant:

The hospitality industry is, by definition, a “brick and mortar” business, and it is still strongly identified as such... I think the problem is more due to a long-lasting situation of unawareness of this industry than the lack of proper education.

If current hoteliers maintain such an attitude toward their own business, then the issue may persist.

4.2.3. Absence of early adopter culture

The early adopter culture refers to accepting something new at an early stage (Janssen et al., 2020). Many hotels operate in accordance with the instruction from their mother brand or long-established practice, allowing hoteliers to take a conservative approach to hotel management (Lam and Law, 2019). This fact cannot help hotels successfully compete with other hotels to survive in the market because the real world is filled with new innovations used in daily life, including hotel accommodation, and failure to embrace this trend makes the industry fall behind in IT innovation and recruitment of IT professionals. Therefore, one stated that:

Why would a creative and innovative spirit join a culture that does not embrace both – or even stifles it? It is more important to adopt more of an entrepreneurial/start up mentality, including appropriately rewarding risk taking and innovation.

In accordance with the Chinese philosophy, only a daredevil can make a fortune. Hence, if a hotel always keeps the same routine, then it can become less attractive to young hoteliers with creative and innovative minds.

4.3. Students/staff

4.3.1. Incorrect career orientation

In the early stage of their careers, students, the future workforce in hospitality, frequently experience two types of misorientations. The first one is to consider hospitality as a simple service industry and mistakenly believe that as long as they can learn to provide excellent services to customers, they are qualified to work in the industry.

The false belief is that ours is a simple industry, but infinite nuances, subtleties, and complex challenges must be overcome almost daily.

This attitude limits students' intention to extend their scope of study and their development of industry skills and overall abilities as social

beings. The negative consequences of this attitude go far beyond the lack of IT or digital professionals in hospitality.

Another point that merits attention is that this attitude is reinforced by industry practitioners. Certain hoteliers believe that technology helps generate quick revenue, but if hotels intend to guarantee a long-term development, then service is still the core.

Technology is not exactly on the top of the list when it comes to making a great hotel and guest experience.

Although technology is not everything for hotels, it can help hotels improve their service and the overall customer perception. Hence, the ignorance of technology is not an option.

The second misorientation is another extreme. Many students majoring in hospitality management aim to become managers at various levels of hotels and for them, management knowledge, such as revenue and operation management, is crucial for their future success. Therefore, IT knowledge is not what they highly value. They ignore the strategic role that technology can play in business, including hospitality. One opinion is quoted as follows:

Many students move into management over time and technology, but fundamental success in a modern hospitality industry is largely overlooked as an important management discipline for a well-rounded hotelier.

Evidently, if a student cannot have the right attitude toward IT, then he or she will neither receive enough preparation in this area nor be qualified to take up such a position.

4.3.2. *Insufficient understanding of the industry's reality*

As fresh graduates are innovative, they are keen on jobs in the industry that require innovation. However, what they face in reality is far from what they expect.

After spending six months installing on-premise PMSs, these kids become brain-dead.

In this situation, the initial problem is created by the industry, which requires those new hoteliers to explore things that are difficult for them. These tasks occupy most of their time at work, so these hoteliers end up having a negative attitude. Cognitive structure learning theory implies that when what people are learning goes far beyond their previous abilities, they will gradually stop learning (Bruner, 1960). Accordingly, they may not only stop taking technological jobs in hotels, but also spread negative word of mouth to prospective hoteliers. Such a lack of mental preparation is worth the attention of all three parties.

4.4. *Further discussion*

Hospitality educators' devotion to preparing students for future careers has been confirmed to directly affect students' readiness and competitiveness in the job market (Faitar and Faitar, 2013). The existence of such a positive correlation between educators and students uncovers the important role educators play in students' professional and academic growth (Cox & Oregovec, 2007). However, due to educators' insufficient preparation of students in facing the technological world and difficulties in effecting change the outdated curricula, there is a lack of IT talents. Educational institutes should frequently evaluate their curricula and teaching content to stay in touch with the changing nature of modern hospitality (Szende, Catafamo, & Upneja, 2019). Based on observation, the real situation is not always the case, which leads to the wide use of outdated textbooks to teach hospitality students many new ideas to thrive in the IT era. Education cannot be replaced by any substitute, and it directly affects the adoption and retaining of the technology in practice. Hence, hospitality educators should seriously reflect on the current problem and frequently remind themselves that modern hospitality

is dynamic and a mechanism should also be established to ensure that the curriculum adopted in hospitality education is industry relevant; moreover, IT must be an integral part of this education (Harkison et al., 2011).

Hotel staff is the key resource that hotels can rely on to generate productivity, quality, and innovation (Vladimirov and Williams, 2018). Thus, hotels must come up with proper ways to attract and retain qualified staff to sustain their continuous expansion. Nevertheless, hoteliers are not concerned about fostering their employees to acquire improved competencies, including IT skills, but rather are concerned about retaining them with minimal cost. In such a way, how can the industry expect to recruit adequate technology staff? Technology is the major force in driving the world to develop at an amazing rate, and almost all industries, including the hospitality industry, resultantly stress the importance of IT staff. Initially, the industry may face challenges in implementing the technological innovation strategy. However, technology has shown to benefit the industry in the long run (Sarmah et al., 2017; Huang et al., 2019). Meanwhile, Torres and Kline (2006) revealed that a high turnover rate among employees in the hospitality industry leaves hospitality operators with no time to provide sufficient training for their employees. Thus, the industry allocates this training duty to hospitality schools. Another important factor is the lack of emphasis on hotels' responsibility in cultivating talented staff.

Hotels do not change their conventional ways of recruiting staff, which also exacerbates the issue. In this changing world, needs can be satisfied in various ways (Allen and Anderson, 2018). Thus, hoteliers must alter their traditional views and accommodate this changing trend. The study demonstrates that the reversed condition exists in the industry, and altering the situation is urgent for the industry.

Finally, students and staff also contribute to this job deficit, although their contribution to this issue is less significant than that of the other two parties. The industry is changing along with the world. On the contrary, students and staff involved in hospitality still adhere to the convention of treating the industry with respect. A sharp contrast is thus formed between their innovative nature and the ever-changing world. If employees lose the passion to embrace challenges and innovations in an industry, then the sustainability of the industry cannot be maintained in the current competitive world (Karnouskos, 2017). This contradictory phenomenon calls for further scholarly attention.

5. *Conclusions*

5.1. *Summary of the study*

The current study adopted the approach of thematic analysis to explore textual data collected from the Internet for determining who should be responsible for the lack of qualified IT or digital marketing staff in the hospitality industry. Through a rigid research design, the research objective was successfully realized. The problem was not caused by education alone, but three parties, namely, education, industry, students/staff, are jointly responsible for the current issue in the job market. For each party, multiple factors that make them take certain behavioral intentions were confirmed to exist.

Regarding the contribution of the study, theoretical and managerial implications can be generated. From the theoretical perspective, only few pre-existing studies have examined the phenomenon. Therefore, the present study is an extension to the current hospitality education literature. Meanwhile, the research confirms for the first time that all three parties involved in the job are responsible for this issue, and the detailed study of the factors paves the way for future theoretical exploration in this area. From the practical perspective, this study offers insight into the causes for the lack of IT staff in the industry, and identifies solutions. The research also bursts the myth that either the education or the industry is fully responsible for this issue by establishing that all parties are responsible in their own ways. This correction is beneficial for seeking the final solution to the issue.

5.2. Recommendations for problem solving

Based on the findings of the study, practitioners can address the lack of IT and digital marketing professionals in hospitality from three perspectives. Firstly, hospitality institutions should help educators become more familiar with the latest technology and its applications in the industry, so educators can be more confident in teaching IT related courses. In this way, educators are able to better design the course curriculum and consequently improve the teaching quality of the course. Secondly, hoteliers should change their traditional way of recruiting IT staff merely from engineering programs, and give more support to hospitality institutions to foster qualified IT professionals for the industry. Meanwhile, the IT staff's contribution to the hotel should be better appreciated in order to stimulate their working motivation and retain them. Finally, hospitality students' career orientation should be led to the correct path and students should fully understand the complex nature of hotel operation rather than perceive it to be a simple industry full of mechanical routines. Moreover, hotels should also believe in young students' capability to learn and operate smart facilities. In the end, a win-win situation can be envisioned. That is, students' inspiration can be stimulated and hotels' performance can be improved.

5.3. Limitations

For the qualitative research, only a small amount of textual data was used because the number of participants involved in the discussion was limited. Meanwhile, the under representation of women in the panel and the absence of students as the source of data should also be acknowledged, as they may influence the interpretation of the examined phenomenon. In addition, the mere use of secondary data without the first-hand interview from the educational area may limit the depth of the research to an extent. Finally, the experts were all from North America and Europe with no representation from other regions. Therefore, all these limitations may restrict the transferability of findings to a wide context. Future studies may further evaluate these limitations and address some of them to enhance the applicability of the research findings.

Declarations

Author contribution statement

Jianwei Qian: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Pearl Lin: Analyzed and interpreted the data; Wrote the paper.

Rob Law: Contributed reagents, materials, analysis tools or data; Wrote the paper.

Xue Li: Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data will be made available on request.

Declaration of interest's statement

The authors declare no conflict of interest.

Additional information

Supplementary content related to this article has been published online at <https://doi.org/10.1016/j.heliyon.2022.e12002>.

References

- Adeyinka-Ojo, S., Lee, S., Abdullah, S., Teo, J., 2020. Hospitality and tourism education in an emerging digital economy. *Worldwide Hospitality and Tourism Themes* 12 (2), 113–125.
- Adukaite, A., Zyl, I., Cantoni, L., 2016. The role of digital technology in tourism education: a case study of South African secondary schools. *J. Hospit. Leisure Sports Tourism Educ.* 19, 54–65.
- Allen, J., Anderson, C., 2018. Satisfaction and frustration of basic psychological needs in the real world and in video games predict internet gaming disorder scores and well-being. *Comput. Hum. Behav.* 84, 220–229.
- Andrew, W.P., 1984. Hospitality education and the technological revolution. *Hospitality Education and Research Journal* 8 (2), 15–21.
- Ashgar, M., Tayyab, M., Gull, N., Zhijie, S., Shi, R., Tao, X., 2021. Polychronicity, work engagement, and turnover intention: the mediating role of perceived organizational support in the hotel industry. *J. Hospit. Tourism Manag.* 49, 129–139.
- Bilgihan, A., Berezina, K., Cobanoglu, C., Okumus, F., 2014. The information technology (IT) skills of hospitality school graduates as perceived by hospitality professionals. *J. Teach. Trav. Tourism* 14 (4), 321–342.
- Bruner, J.S., 1960. *The Process of Education*. Vintage Books, New York.
- Chan, E., Okumus, F., Chan, W., 2020. What hinders hotels' adoption of environmental technologies: a quantitative study. *Int. J. Hospit. Manag.* 84, 102324.
- Christou, E., 2002. Revisiting competencies for hospitality management: contemporary views of the stakeholders. *J. Hospit. Tourism Manag.* 14, 25–32.
- Chytiri, A., Filippaios, F., Chytiris, L., 2018. Hotel recruitment and selection practices: the case of the Greek Hotel Industry. *International Journal of Organizational Leadership* 7, 324–339.
- Cox, B.E., Orehovec, E., 2007. Faculty-student interaction outside the classroom: a typology from a residential college. *Rev. High. Educ.* 30 (4), 343–362.
- Dopson, L., 2005. Determinants of important underlying dimensions of e-commerce competencies in hospitality curricula from the hotel managers' perspective. *J. Teach. Trav. Tourism* 4 (3), 69–85.
- Ezzaoui, I., Bulchand-Gidumal, J., 2022. The impact of information technology adoption on hotel performance: evidence from a developing country. *J. Qual. Assur. Hospit. Tourism* 1–23.
- Faitar, T.R., Faitar, S.L., 2013. Teachers' influence on students' science career choices. *Am. Int. J. Soc. Sci.* 2 (5), 10–16.
- Ferrari, A., Cachia, R., Punie, Y., 2009. Innovation and Creativity in Education and Training in the EU Member States: Fostering Creative Learning and Supporting Innovative Teaching. Retrieved from. http://ftp.jrc.es/EURdoc/JRC52374_TN.pdf.
- Fraser, B., 2020. From hospitality classrooms to successful careers: a current appraisal of Australian international hotel requirements. *J. Hospit. Tourism Educ.* 32 (4), 234–254.
- Goh, E., Wen, J., 2020. Applying the technology acceptance model to understand hospitality management students' intentions to use electronic discussion boards as a learning tool. *J. Teach. Trav. Tourism* 21 (2), 142–154.
- Griffin, W., 2021. The future of hospitality education: a reflection. *J. Hospit. Tourism Res.* 45 (5), 939–941.
- Hallin, C.A., Marnburg, E., 2008. Knowledge management in hospitality industry: a review of empirical research. *Tourism Manag.* 29 (2), 366–381.
- Harkison, T., Poulston, J., Kim, J., 2011. Hospitality graduates and managers: the big divide. *Int. J. Contemp. Hospit. Manag.* 23 (3), 377–392.
- Huang, Y.C., Chang, L.L., Yu, C.P., Chen, J., 2019. Examining an extended technology acceptance model with experience construct on hotel consumers' adoption of mobile applications. *J. Hospit. Market. Manag.* 28 (8), 957–980.
- Im, U.L., 2011. Literature Review on Turnover – to Better Understand the Situation in Macau. University of Nevada, Las Vegas, NV. Retrieved from. <http://digitalscholarship.unlv.edu/thesesdissertations/1149>.
- Janssen, M., Weerakkody, V., Ismagilova, E., Sivarajah, U., Irani, Z., 2020. A framework for analyzing blockchain technology adoption: integrating institutional, market and technical factors. *Int. J. Inf. Manag.* 50, 302–309.
- Jiang, L., Alexakis, G., 2017. Comparing students' and managers' perceptions of essential entry-level management competencies in the hospitality industry: an empirical study. *J. Hospit. Leisure Sports Tourism Educ.* 20, 32–46.
- Johanson, M., Ghiselli, R., Shea, L.J., Roberts, C., 2011. Changing competencies of hospitality leaders: a 25-year review. *J. Hospit. Tourism Educ.* 23 (3), 43–47.
- Karnouskos, S., 2017. Massive open online courses (MOOCs) as an enabler for competent employees and innovation in industry. *Comput. Ind.* 91, 1–10.
- Kay, C., Moncarz, E., 2004. Knowledge, skills, and abilities for lodging management success. *Cornell Hotel and Restaurant Quarterly* 45 (3), 285–298.
- Kay, C., Russette, J., 2000. Hospitality-management competencies. *Cornell Hotel Restaur. Adm. Q.* 41 (2), 52–63.
- Khan, A., Khan, N., Bodla, A., 2021. The after-shock effects of high-performers turnover in hotel industry: a multi-level study. *Int. J. Contemp. Hospit. Manag.* 33 (10), 3277–3295.
- Khatri, I., 2019. Information technology in tourism & hospitality industry: a review of ten years' publications. *Journal of Tourism and Hospitality Education* 9, 74–87.
- Lam, C., Law, R., 2019. Readiness of upscale and luxury-branded hotels for digital transformation. *Int. J. Hospit. Manag.* 79, 60–69.

- Li, L., Li, J., 2013. Hospitality education in China: a student career-oriented perspective. *J. Hospit. Leisure Sports Tourism Educ.* 12 (1), 109–117.
- Lugosi, P., Jameson, S., 2017. Challenges in hospitality management education: perspectives from the United Kingdom. *J. Hospit. Tourism Manag.* 31, 163–172.
- Marshall, M., 1996. Sampling for qualitative research. *Fam. Pract.* 13 (6), 522–526.
- Maybury, T., Swanger, N., 2011. Identification of industry needs for baccalaureate hospitality graduates: a Delphi study. *J. Hospit. Tourism Educ.* 23 (4), 33–45.
- Mayo, C.R., Thomas-Haysbert, C., 2005. Essential competencies needed by hospitality and tourism management graduates as determined by industry professionals and hospitality educators. *Consortium J. Hosp. Tour. Manag.* 9 (2), 5–17.
- Melian-Alzola, L., Fernandez-Monroy, M., Hidalgo-Penate, M., 2020. Information technology capability and organizational agility: a study in the Canary Islands hotel industry. *Tourism Manag. Perspect.* 33, 100606.
- Nelson, A.A., Dopson, L., 2001. Future of hotel education: required skills and knowledge for graduates of US hospitality programs beyond the year 2000 – Part One. *J. Hospit. Tourism Educ.* 13 (5), 58–67.
- Nowell, L., Norris, J., White, D., Moules, N., 2017. Thematic analysis: striving to meet the trustworthiness criteria. *Int. J. Qual. Methods* 16 (1), 1–13.
- Nyheim, P.D., McKadden, F.M., Connolly, D.J., 2005. Technology Strategies for the Hospitality Industry. Prenice Hall, Upper Saddle River, NJ.
- Okumus, F., 2013. Knowledge management through information technology in hospitality organizations. *Journal of Hospitality and Tourism Technology* 4 (1), 64–80.
- Patiar, A., Kensbock, S., Ma, E., Cox, R., 2017. Information and communication technology-enabled innovation: application of the virtual field trip in hospitality education. *J. Hospit. Tourism Educ.* 29 (3), 129–140.
- Piccoli, G., Torchio, P., 2006. The strategic value of information: a manager's guide to profiting from information. *Cornell Hospitality Report* 7 (6), 4–14. Retrieved from. <http://www.hotel.cornell.edu/chr/pdf/showpdf/579/chr/research/piccolitopost.pdf>.
- Sarmah, B., Kamboj, S., Rahman, Z., 2017. Co-creation in hotel service innovation using smart phone apps: an empirical study. *Int. J. Contemp. Hospit. Manag.* 29 (10), 2647–2667.
- Sigala, M., 2021. Rethinking of tourism and hospitality education when nothing is normal: restart, recover, or rebuild. *J. Hospit. Tourism Res.* 45 (5), 920–923.
- Sonnenschein, K., Barker, M., Hibbins, R., 2017. Fit for purpose: graduate attributes needed in the Chinese hotel industry. *J. China Tourism Res.* 13 (3), 257–275.
- Squires, M., 2008. Technology changes lodging workforce. *Lodg. Hosp.* 64 (16), 89–94.
- Suh, E.J., West, J.J., Shin, J.U., 2012. Important competency requirements for managers in the hospitality industry. *J. Hospit. Leisure Sports Tourism Educ.* 11 (2), 102–112.
- Torres, E.N., Kline, S., 2006. From satisfaction to delight: a model for the hotel industry. *Int. J. Contemp. Hospit. Manag.* 18 (4), 290–301.
- Underthun, A., Jordhus-Lier, D., 2018. Liminality at work in Norwegian hotels. *Tourism Geogr.* 20 (1), 11–28.
- Vladimirov, Z., Williams, A.M., 2018. Hotel innovations and performance – the mediating role of staff related innovations. *Tourism Manag. Perspect.* 28, 166–178.
- Wen, H., Li, X., Kwon, J., 2019. Undergraduate students' attitudes toward and perception of hospitality careers in Mainland China. *J. Hospit. Tourism Educ.* 31 (3), 159–172.
- White, R., 2007. Historicity, narrative, and metaphor: my journey through historical research. In: Taylor, P.C., Wallace, J. (Eds.), *Contemporary Qualitative Research: Exemplars for Science and Mathematics Educators*. Springer, Dordrecht, The Netherlands, pp. 33–43.