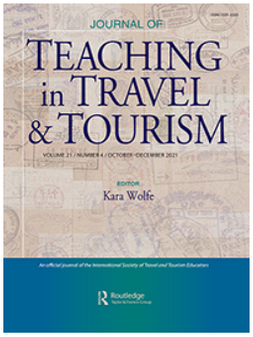

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Double-edged perspectives on service robots: working with robots and robots' future career impacts

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ABSTRACT

This study investigates the perspectives of undergraduate tourism and hospitality students on working with robots and the influence of the widespread use of robots on future careers. Accordingly, interviews were conducted with thirty students. The findings include two main categories: working with robots in the tourism and hospitality industry (advantages of working with robots, disadvantages of working with robots, and willingness to work with or implement robots) and future career impacts of the widespread use of robots (threatening human employment, reducing the motivation toward working in the industry, unfair competition between humans and robots, negative psychological impact/feeling of being less skilled than robots, and giving up/changing the industry). This research contributes to the literature by revealing the dimensions of working with robots and the future career impacts of the widespread use of robots. A model of future career impacts of the widespread use of robots was also proposed.

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Service robots; tourism and hospitality industry; working with robots; tourism and hospitality students; robots' career impacts

1. Introduction

Lately, the tourism and hospitality (T&H) industry has increasingly preferred utilising service robots to decrease costs, create experiences, increase service efficiency, improve quality, and gain a competitive advantage (Seyitoğlu & Ivanov, 2020a). However, the usage of service robots has increased as they were considered helpful during the current pandemic to limit human interaction and provide physical distancing (Seyitoğlu & Ivanov, 2021). Studies that are investigating service robots within the scope of the T&H industry focus on the topics such as customer and robot interactions (Fuentes-Moraleda et al., 2020), the influence of service robots on service quality (Chiang & Trimi, 2020), the role of service robots in physical distancing (Seyitoğlu & Ivanov, 2021), employees and managers perceptions of service robots (Shin & Jeong, 2020; Vatan & Dogan, 2021), managers and customers' perceptions of service robots in

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restaurant context (Seyitoğlu et al., 2021), customers' perceptions upon the use of service robots (Shin & Jeong, 2020), and robotic restaurant experience (Seyitoğlu & Ivanov, 2022).

The abovementioned studies are mainly related to human-robot interaction from the customer, manager, and employee's perspective, who are the key stakeholders impacted by the service robots. Nevertheless, although the importance of T&H students is well-recognised in the industry, there are limited studies that examine T&H students' perception of the use of service robots (Ivkov et al., 2020; Wakelin-Theron, 2021). To the best of our knowledge, there is no study investigating the future career impacts of the widespread use of service robots on T&H students. However, as prospective employees or professionals, T&H students are considered the industry's backbone (Li et al., 2021). Additionally, despite the growing interest and discussions on the implementation of service robots in the T&H sector, it is yet unknown systematically the knowledge that has been built from academic papers focusing on students' perception regarding service robots. Hence, this timely study attempts to fill the void by exploring T&H undergraduates' perspectives on working with robots and robots' future career impacts.

This research selected T&H undergraduates in Turkey as a research sample due to several reasons. First, Turkey relies heavily on the T&H industry. In 2019, 51.7 million international tourists visited Turkey (Turkish Statistical Institute [TUIK], 2021). In this vein, by providing well-educated and qualified tourism employees, tourism institutions can help industry practitioners to deliver quality service to customers (Yıldırım et al., 2016). Furthermore, tourism education has been provided since 1953 in Turkey (Olcay, 2008). Today, 133 universities offer tourism education in four key departments, including tourism management, gastronomy and culinary arts, tourism guiding, and recreation management (Association of Turkish Tourism Academics, 2019).

Finally, previous studies on service robots and T&H students were conducted in different countries, such as South Africa (Wakelin-Theron, 2021), Serbia (Ivkov et al., 2020), and other contexts. From these studies, while Wakelin-Theron (2021) explored the students' perceptions towards autonomous service robots, Ivkov et al. (2020) investigated the attitudes of T&H students, as future professionals, towards the willingness to implement service robots. However, there is a lack of research on service robot perception of T&H students adopting a more holistic and broader perspective in other countries' contexts. These reasons and the gaps mentioned above motivated us to cover this topic in a more holistic context in an emerging tourism destination (i.e., Turkey). In this regard, this study explores T&H undergraduates' perceptions of working with robots and robots' future career impacts in the context of Turkey.

This research will contribute to the literature from theoretical and practical perspectives. From the theoretical standpoint, since no study covered the role of service robots on tourism undergraduates' career paths, this research will help complete the main framework of factors influencing T&H students' careers. Given the scarcity of research on understanding tourism undergraduates' willingness to work with robots, this research will contribute to the literature as it explores future employees' perceptions. Finally, the findings of this study will also be beneficial in tourism practitioners' robot implementation decisions.

2. Literature review

In the T&H context, service robots refer to autonomous intelligence that helps destination visitors and service providers with their personal or professional purposes (Park, 2020). In recent years, T&H businesses such as restaurants, airports, hotels, and bars have started to use robotic technologies (Ivanov et al., 2019). Some scholars expect that service robots will replace employees working in a wide range of departments in T&H businesses (Belanche et al., 2021; Murphy et al., 2017). In addition, a report published by the International Federation of Robotics (2020) stated that the implementation of professional robots for service industries has been increasing every year. Its sales value increased by 32% to 11.2 billion dollars worldwide (2018–2019). The McKinsey Global Institute predicts that between 400 million and 800 million of today's jobs will be automated in the coming decades (Meyer, 2017). This indicates that many companies will continue to use these technologies in their services.

Previous research demonstrated that customers support T&H businesses to use robotic applications in their services (Lu et al., 2019). T&H companies utilise service robots to decrease costs and increase competitiveness (Ivanov & Webster, 2019a). Besides, T&H firms implement service robots to enrich customer experiences and ensure extra benefits for them, such as welcoming customers, enhancing or developing service consistency or decreasing waiting times (H. Qiu et al., 2020). According to Tuomi et al. (2021), T&H service providers use service robots for simple tasks such as helping to perform customer check-ins/outs, managing restaurant lines, ensuring information about services and products, dealing with payments and taking customers' orders. On the other side, Murphy et al. (2017) determined three main robot areas in the T&H areas such as industrial (i.e., food preparation), professional service (i.e., room cleaning, heritage preservation, telepresence, robots at conferences, and medical tourism) and personal service (i.e., concierge robots in hotels, and visitor centres, museum guides, airport and destination greeters).

In the T&H industry, for example, Alibaba Group, known as the Chinese e-commerce corporation, owns a hotel (The FlyZoo Hotel in Hangzhou, China) generally run by robots. These robots manage customers' reservations and payments through facial-recognition technology from a mobile app (Biron, 2019). In addition, Hilton McLean in Virginia hired a robot named Connie (robot concierge) to enhance the guest experience. Connie delivers customers a wide range of information when they plan to visit, helps guests' needs, and customises guests' experiences (Hilton, 2016). Vacuum-cleaning grounds, preparing drinks, entertaining guests, guiding guests, and delivering services to guests are other robotic services offered to hotel guests (Ivanov et al., 2019).

Some restaurants employ robot chefs and waiters to simplify the process of cooking, reduce operating costs, and enhance customers' experience (Joshi, 2020). For instance, Country Garden, located in Guangdong, China, is one of the first fully robot-run restaurants. In this restaurant, customers give their orders via QR, and the system delivers them to the robot chefs to be prepared. However, despite its popularity in restaurants, there are some concerns about utilising service robots in these service environments, including food taste, food variety, and employment (Joshi, 2020). In particular, two-thirds of Americans anticipate that robot employees will dominate the food industry, and most Americans (80%) think that robots will destroy their job opportunities in the future (Shewan, 2017). These concerns were confirmed in previous research by evoking negative

emotions toward using robotic applications (Seyitoğlu et al., 2021). These examples can be extended to other service areas, such as airports and bars. In particular, it is pointed out that service robots will take hold of airports by 2030 (Mariano, 2018).

The current literature generally concentrates on robot-customer interaction and the perception of tourism employees or managers toward implementing robotic applications. For instance, a recent study (Vatan & Dogan, 2021), which illuminated the perception of hotel employees toward service robots, highlighted that service robots would cause job losses in hotels and indicated that employees are not ready to work with a robot. Another study (Ivanov et al., 2020) that examined hotel managers' perceptions towards the usage of robots showed that hotel managers desire to use service robots in monotonous, filthy, dull, and risky tasks, which was proved in previous research (Ivanov & Webster, 2019b, Ivanov & Webster, 2020). Furthermore, hotel managers implied that service robots could not replace human employees because the robots lack social skills and emotional intelligence (Ivanov et al., 2020). A recent study (Seyitoğlu et al., 2021) purports that, on the one hand, restaurant service providers find service robots beneficial as they would reduce the workload of human employees and increase the service quality in restaurants. However, on the other hand, they have negative attitudes toward service robots because they believe that service robots will take their jobs in the future (Seyitoğlu et al., 2021). A recent study (Wakelin-Theron, 2021) on students' perceptions toward service robots also emphasises that students perceived service robots as a threat to human employment. Students also implied that they could lose their job after graduation if tourism firms have increasingly used robots in the future (Wakelin-Theron, 2021). However, the students find service robots advantageous as robots can do repetitive tasks, which will enable human employees to focus on more important tasks to improve service quality (Wakelin-Theron, 2021).

On the other side, two recent papers examine students' perceptions of implementing service robots in the T&H industry. First, Ivkov et al. (2020) proposed a model to understand T&H students' willingness to implement service robots by adopting a quantitative approach. As a result of the analysis, the authors revealed that students' desire to implement service robots was impacted by the expected business outcome, performance, experience, reliability, tangibles, service assurance, and communication and interaction. The second paper (Wakelin-Theron, 2021), benefiting from interviews and drawings, explored students' perceptions and experiences of autonomous service robots in the industry. This paper was conducted at a Public Higher Education Institution in Johannesburg (South Africa) and explored four main themes; "robots do have a place", "robots effective and efficient use in the industry", "better experiences", and "humans are more powerful than robots".

It is evident that previous studies have mostly emphasised the importance of service robots in the industry and illustrated the tasks that service robots can do. Further, earlier papers presented employees' perceptions of using service robots in their service environment. However, although two pieces examined the topic of T&H students and service robots, they did not detail student perceptions of the service robots. Additionally, there is only one qualitative paper on the subject (Wakelin-Theron, 2021). Thus, further qualitative studies are needed to understand the main picture of tourism and hospitality students' perceptions regarding the implementation of service robots in the industry. Apart from these, there is a lack of evidence for the use of service robots on the career impacts of T&H undergraduates. To this end, our paper fills the research gap by

conducting a qualitative research approach to understand T&H undergraduates' perceptions of using service robots in an emerging tourism destination (Turkey) and explore a neglected research area related to service robots' future careers effects on students.

3. Methodology

The present study followed a qualitative approach to understand tourism and hospitality undergraduates' views towards working with service robots and robots' career impacts. The qualitative approach is the best way to explore people's ideas and opinions about a topic since there are no presuppositions (Rezaei et al., 2022). This approach can be constructive for the first studies examining a research subject and yield more profound and comprehensive knowledge.

3.1. Sample and data collection

In accordance with the research goals, the purposive sampling technique was used to reach tourism undergraduates in Turkey. Thus, semi-structured qualitative interviews were conducted between March and June 2021. Before interviewing participants, as a feasibility assessment, we firstly consulted a few experts in tourism education to ensure the clarity of the interview questions and to determine their suitability for the research purpose. In the next phase, a pilot study with two undergraduates was conducted, and the authors transcribed the obtained data to refine, reformulate, and reorganise the interview questions. These stages helped us ensure research questions' understandability and enhance research quality (i.e., establishing validity and reliability). Furthermore, three main criteria were determined for choosing a research sample: participants should study in a department of tourism faculty in Turkey; they should be aware of the T&H industry and be heavily interested in recent trends; students should have work experience in the T&H sector for at least one season.

To conduct the interviews, the T&H undergraduates were asked whether they would prefer to participate in the interview through an online platform (WhatsApp or Zoom) due to the Covid-19 pandemic. After taking their consent, an invitation was sent to them to conduct an interview. Each interview was voice-recorded with the approval of the students and then transcribed for data analysis. After the authors decided that the data saturation was reached (Glaser & Strauss, 1967), they agreed to cease the data collection. Finally, all interviews were conducted in Turkish and later translated into English, and the duration of interviews with thirty students ranged from 20 to 67 minutes.

3.2. Data analysis

The data were examined through content analysis. Four independent coders were involved in the data analysis to perform coding on the data contents. Coders followed some phases to reach a consensus on critical themes and sub-themes. First, they read and re-read the transcripts before they started to code statements for breaking the data into smaller parts. Next, coders brought these small parts together to create the study's central

themes. As a result of the analysis, all coders reported their themes and sub-themes. Then, they discussed the themes to form the results. Since the authors separately implemented the analysis process and critically discussed each other's coding, objectivity was ensured.

4. Findings and discussion

Table 1 shows the students' demographics. Accordingly, nine of the participants were male, and twenty-one were female. Their age differed from 19 to 25. Half of the participants (15 students) are fourth class or year. Finally, there were 16 students in tourism management, 6 in gastronomy and culinary arts, 4 in tourism guiding, and 4 in recreation management. The findings demonstrate that two main categories were extracted (see, Table 2): 'working with robots in the T&H industry' and 'future career impacts of the widespread use of robots'. In addition, under each theme and sub-theme, the direct quotations of undergraduate students were marked with "S" and their numbers (for instance, S3 refers to student 3 in Table 1).

4.1. Working with robots in the tourism and hospitality industry

Working with robots in the tourism and hospitality industry consists of three main themes (advantages of working with robots, disadvantages of working with robots, and willingness to work with or implement robots). In addition, each theme includes sub-themes.

Table 1. Students' profiles.

Participant	Gender	Age	Class/year	Department
S1	Female	23	4	Tourism Management
S2	Male	24	4	Tourism Management
S3	Male	25	2	Recreation Management
S4	Female	21	3	Tourism Management
S5	Male	21	2	Recreation Management
S6	Female	23	3	Tourism Management
S7	Male	22	2	Recreation Management
S8	Female	22	4	Tourism Management
S9	Female	22	4	Tourism Management
S10	Male	21	2	Recreation Management
S11	Female	24	4	Tourism Management
S12	Female	22	4	Tourism Management
S13	Female	23	4	Tourism Management
S14	Female	25	4	Tourism Management
S15	Female	23	4	Tourism Management
S16	Female	25	4	Tourism Management
S17	Female	22	4	Tourism Management
S18	Female	24	4	Tourism Management
S19	Female	21	4	Tourism Management
S20	Male	21	4	Tourism Management
S21	Female	21	2	Gastronomy and Culinary Arts
S22	Male	21	4	Gastronomy and Culinary Arts
S23	Female	20	3	Gastronomy and Culinary Arts
S24	Female	19	2	Gastronomy and Culinary Arts
S25	Female	21	3	Gastronomy and Culinary Arts
S26	Female	20	3	Gastronomy and Culinary Arts
S27	Female	20	3	Tourism Guiding
S28	Male	23	3	Tourism Guiding
S29	Female	21	3	Tourism Guiding
S30	Male	24	3	Tourism Guiding

Table 2. The findings.

Categories	Themes and/or sub-themes
Working with robots in the tourism and hospitality industry	**1. Advantages of working with robots** *-**doing repetitive, dirty, dull and dangerous tasks:** reducing the workload of human employees, increasing human employees' performance, helping human workers to spend less effort, reducing the stress of timing of tasks, and improving the service quality* ***-lack of human issues/problems (i.e., late for work, failure to fulfil responsibilities, failing to do the job on time)*** ***-close the gap in communicating with guests in other languages*** ***-eliminating conflicts and problems between human employees*** *-**being tireless and fast:** timesaving and making tasks easier* **2. Disadvantages of working with robots** ***-lack of social interactions with customers and co-workers*** ***- lack of human-level communication skills*** ***-lack of problem-solving skills*** ***-lack of human teamwork as a motivator*** **3. Willingness to work with or implement robots** *(i) **Willing to work with robots:** S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S15, S16, S18, S19, S20, S22, and S25.* ***Reasons:** robot-human collaboration is advantageous; robots will reduce the workload; robots will be fun; robots will make the tasks easier; robots will increase the efficiency; working with robots will be a different experience; robots will not have human issues/problems in the work environment; working with robots will be exciting; human employees need to get used to working with robots.* *(ii) **Not willing to work with robots:** S1, S13, S14, S17, S23, S24, S26, S27, S28, S29, and S30.* ***Reasons:** the need for social interactions with co-workers; robots do not have human-level communication skills.* *(iii) **Willing to implement robot (as a future manager):** S1, S2, S3, S4, S5, S8, S9, S10, S11, S12, S13, S14, S15, S17, S19, S20, S21, S22, S24, S25, S26, S28, and S29.* ***Reasons:** robots will reduce the costs; robots will decrease the workload; robots will make the tasks easier; robots will increase the performance; robots will increase the profit; robots will be attractive and entertaining; robots will improve the guest satisfaction; robots will add value to the image.* *(iv) **Not willing to implement robots (as a future manager):** S18, S23, S27, and S30.* ***Reasons:** preferring human employees; supporting the tourism workforce.*
Future career impacts of the widespread use of robots	**1. Threatening human employment** *-reducing job opportunities for human employees,* *-decreasing the need for a human workforce* *-increasing the layoffs* **2. Reducing the motivation toward working in the industry** **3. Unfair competition between humans and robots** **4. Negative psychological impact/ feeling of being less skilled than robots** **5. Giving up/changing the industry**

4.1.1. Advantages of working with robots

This theme refers to the beneficial aspects of working with robots in the T&H industry. Tourism undergraduates who participated in this study mentioned service robots' various features that can be advantageous while working with them. These features are: (i) doing repetitive, dirty, dull and dangerous tasks, (ii) lack of human issues/problems (i.e., late for

work, failure to fulfil responsibilities, failing to do the job on time), (iii) close the gap of communicating with guests in other languages, (iv) eliminating conflicts and problems between human employees, and (v) being tireless and fast.

The participants mentioned *doing repetitive, dirty, dull and dangerous tasks* as the most crucial feature of service robots because it leads to various advantages such as reducing the workload of human employees (S1, S13, S14, S15, S16, S20, S23, S25), increasing human employees' performance (S3, S8, S13, S22), helping human workers to spend less effort (S9, S13, S14, S20, S30), reducing the stress of timing of tasks (S9), and improving the service quality (S22). For instance, S13 hints that working with robots will be advantageous because they can do repetitive, dirty, dull and dangerous tasks. She (S13) explains that this feature of service robots will decrease her workload in the industry. Another student (S8) indicates that since robots will do the tasks (dirty, dull and dangerous) that require more time, human workers would have better performance and more time to focus on their vocational learning and development. In this vein, S22 stresses that this advantage of service robots could also improve tourism companies' service quality.

Lack of human issues/problems (i.e., late for work, failure to fulfil responsibilities, failing to do the job on time) is another feature of service robots that leads to an advantage while working with them in the T&H industry. According to S6, since robots do not have human issues or problems such as having responsibilities (family, children etc.), being late for work, or not doing the given task, they are advantageous for tourism companies. Moreover, S14 explains that "Service robots can be advantageous in the T&H industry. For example, I need food and rest, but the robot does not have such needs . . . ".

Students also implied that robots are advantageous as they can *close the gap in communicating with guests in other languages*. In this regard, S12 purports that robots could be beneficial as they are programmable and can speak multi-languages. In addition, S14 states that " . . . it can help me to have guests talk to robots in a language I don't know. It would be advantageous for me if the robots could communicate with the guests in languages that I do not know . . . ".

Robots are also advantageous in tourism services by *eliminating conflicts and problems between human employees*. In this aspect, S4 hints that "First of all, you always have conflicts or problems with your colleague in the work environment. But such situations will not exist when you work with service robots". Besides, S27 expresses that " . . . On the other hand, working with robots would ensure that conflicts, arguments, or gossip among employees in the workplace will not occur".

The last and significant advantageous feature of robots in the T&H industry was extracted as *being tireless and fast*. This characteristic is considered *timesaving* and *making tasks easier*. In this respect, S19 states that the most significant advantage of service robots is *being fast*. S28 adds that being fast is a crucial advantage because it saves time in the work process. Furthermore, S3 underlines that " . . . As an advantage . . . I think robots can be helpful when I am tired while working because they are tireless. Since robots are tireless and fast, they can be advantageous . . . Moreover, my performance could increase thanks to robots because they will make the tasks easier".

Although there is no specific study conducted on the advantageous features of robots in the context of *working with robots in the tourism and hospitality industry* from the perspectives of tourism undergraduates, the literature specifies the general beneficial

features of service robots in the T&H industry context. For instance, the ability to implement tasks in time and correct ways, the ability to work 24/7, being fast, not getting bored, having the provision of information in more languages than humans, can perform the same tasks many times, not getting ill or not complain while working are among the advantages of service robots (Ivanov et al., 2020).

Furthermore, a recent study (Wakelin-Theron, 2021) emphasised that undergraduate tourism and hospitality students find service robots advantageous as they can do mundane and repetitive tasks. It is further stated that this advantage enables human employees to concentrate on more significant tasks to improve service quality. Service robots are also beneficial in communicating in different languages and working for longer hours (Wakelin-Theron, 2021). On the other side, robots can raise the service capacity of companies by allowing them to serve more guests with fewer human employees (Ivanov, 2019). Robots may also enable human employees to develop themselves by obtaining new, more complex skills (Smids et al., 2020).

4.1.2. Disadvantages of working with robots

As the second theme of working with robots in the tourism and hospitality industry, *disadvantages of working with robots* includes sub-themes such as *lack of social interactions with customers and co-workers* (S5, S10, S12, S13, S17, S25, S28), *lack of human-level communication skills* (S7, S18, S21, S28), *lack of problem-solving skills* (S19), and *lack of human teamwork as a motivator* (S10). According to the participants, among these disadvantageous features, lack of social interactions with customers and co-workers in the work environment is extracted as the most critical one. In this aspect, S5 implies that working with robots would be a barrier to interacting with customers and co-workers, which would be a disadvantage in the work environment while working with robots in the T&H industry. Another student (S12) hints that service robots would decrease the communication between humans (employees and customers), which is a significant disadvantage in the T&H industry. Further, S17 explains that "The disadvantageous features of robots are … I would not be able to chat or laugh with service robots while working. It won't be possible to hang out with a robot co-worker after work. I would not be able to talk about my problems with them. These are the disadvantages that can prevent socialisation".

Lack of human-level communication skills is the second most significant issue that tourism undergraduates stress as a feature that causes a disadvantage. This feature can also be associated with the previous theme (lack of social interactions with customers and co-workers) because, without human-level communication skills, social interactions with customers and co-workers may not be possible. Related to this issue, S28 states that " … service robots have the following unfavourable features for tourism workers: robots would be problematic in communication. You don't have a chance to convey your feelings to robots. Thus, problems in communicating may arise in the workplace". S18 further clarifies that the lack of communication skills may damage the coordination in the work environment where service robots and human employees work together.

Finally, *lack of problem-solving skills* (S19) and *lack of human teamwork as a motivator* (S10) are also considered disadvantageous features of working with service robots in the T&H industry. First, S19 reports that "Regarding the disadvantages of service robots … people need to solve many problems that may arise because service robots would not

understand the problems or special requests. You will still need to communicate with human employees to solve possible problems in the tourism services. To get positive feedback, you still have to work for people to be satisfied". Moreover, S10 hints that "working with human teamwork can motivate you in the work environment; however, service robots would not provide this opportunity, which is a disadvantage … Also, working with robots can make human workers feel lonely … So, working with robots is in no way a substitute for chatting with a human friend in the work environment".

The literature supports that service robots have some unfavourable features. For example, lack of communication and social skills and feelings and emotions are among the most crucial ones (Ivanov et al., 2020; Seyitoğlu & Ivanov, 2021) that would be an obstacle to implementing robots in the T&H industry (Hanqin Qiu et al., 2021). Social skills are vital in tourism and hospitality services as hospitableness is based on social interactions (Tasci & Semrad, 2016). It is also emphasised that robots have disadvantages in their current technological forms, such as not fulfilling customers' special requests and not understanding their desires (Ivanov et al., 2020).

4.1.3. Willingness to work with or implement robots

Willingness to work with or implement robots includes four main sub-themes: *willing to work with robots, not willing to work with robots, willing to implement robots (as a future manager)*, and *not willing to implement robots (as a future manager)*. First, while a significant number of undergraduate students (18 students) are willing to work with robots, the rest are unwilling to work with them. On the other side, only four participants are unwilling to implement service robots (as a future manager). The participants' opinions and their reasons for their willingness to work with or implement robots are presented in Table 2.

4.1.3.1. Willing to/Not willing to work with robots. The undergraduate students (S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S15, S16, S18, S19, S20, S22, and S25) who are willing to work with robots in the T&H industry provide some reasons to support their opinions: *robot-human collaboration is advantageous; robots will reduce the workload; robots will be fun; robots will make the tasks easier; robots will increase the efficiency; working with robots will be a different experience; robots will not have human issues/problems in the work environment; working with robots will be exciting; human employees need to get used to working with robots*. For instance, S3 thinks that working with service robots would be fun. He (S3) further explains that "Some cleanings make me tired. For example, when I work at night shift, I feel exhausted … In this aspect, a robot co-worker who helps me do these tasks would make me very happy". Additionally, S6 states that she is willing to work with robots in the T&H industry because they would make the tasks easier and decrease the workload of human employees. She (S6) adds that human employees need to get used to working with robots as technology is developing, and accordingly, robots may be widespread.

On the flip side, participants (S1, S13, S14, S17, S23, S24, S26, S27, S28, S29, and S30) who are not in favour of working with robots state that since *social interactions with co-workers* is a need and *robots do not have human-level communication skills*, they are not willing to work with robots in the T&H industry. In this vein, S13 implies that human-level communication skills and social interactions with co-workers are crucial aspects of the

working environment, and unfortunately, service robots would not provide them. Hence, she (S13) is unwilling to work with service robots in the T&H industry because she states that the deficiency of these aspects would negatively affect her working motivation.

4.1.3.2. Willing to/Not willing to implement robots (as a future manager). The participants (S1, S2, S3, S4, S5, S8, S9, S10, S11, S12, S13, S14, S15, S17, S19, S20, S21, S22, S24, S25, S26, S28, and S29) who are willing to implement robots when they would be future managers in the T&H industry provide several reasons: *robots will reduce the costs; robots will decrease the workload; robots will make the tasks easier; robots will increase the performance; robots will increase the profit; robots will be attractive and entertaining; robots will improve the guest satisfaction; robots will add value to the image*.

S22 was one of the students willing to implement robots when he became a manager in a tourism company. He elucidates that "If I were a manager in a tourism business, I would prefer robots … But I wouldn't prefer a completely robotic service system. I would only identify the areas where it is essential to use robots and prefer it that way. I think that robots will contribute to businesses, especially hotel businesses. Employees may get tired and want to rest, but this is not the case with robots. Therefore, I think in these aspects, service robots can be advantageous. Additionally, I think robots will be more beneficial for the background tasks". Furthermore, S1 denotes that as a future manager, she would benefit from service robots for her company because they will reduce the workload, decrease the costs, increase the performance, and contribute to the total profit.

On the contrary, some undergraduate students (S18, S23, S27, and S30) are unwilling to implement robots in their companies when they become managers. Their reasons shaped as *preferring human employees* and *supporting the tourism workforce*. Accordingly, S18 hints that as a manager in the future, she would not implement robots in her company as she wants to prevent unemployment in the T&H industry. Thus, the idea of S18 demonstrates that she considers service robots a threat to the tourism workforce. Besides, S23 expresses, "If I were a manager in a tourism business, I would not prefer robots … I would prefer to work with the human workforce instead of robots".

Though the perspectives of undergraduate T&H students are significant, as they are likely to be the future employees and managers of the industry, no study on the views of T&H students in terms of working with or implementing robots (as future managers) exists in the literature. However, the current literature includes research on the perceptions of tourism employees, managers and owners towards working with or implementing robots. In this regard, one of the recent papers (Ivanov et al., 2020), which analysed Bulgarian hotel managers' perceptions of service robots, stressed that most hotel managers who participated in the study do not want to implement service robots due to some reasons: relying on human employees, the need for human-level interactions, the inconsistency of robots and their guest's profile. Besides, the recent study (Seyitoğlu et al., 2021), which investigated Turkish restaurant managers' and customers' perceptions of robots, expresses that while most restaurant customers have positive attitudes toward robots, the majority of participating restaurant managers have negative perspectives regarding

implementing service robots in their restaurants. However, our findings contradict these studies and present opposite results because most Turkish students included in this study are willing to work with or implement robots.

4.2. Future career impacts of the widespread use of robots

Future career impacts of the widespread use of robots was extracted as the second main category. This category includes the themes such as (i) threatening human employment (reducing job opportunities for human employees, decreasing the need for a human workforce, and increasing the layoffs), (ii) reducing the motivation toward working in the industry, (iii) unfair competition between humans and robots, (iv) negative psychological impact/ feeling of being less skilled than robots, and (v) giving up/changing the industry.

4.2.1. Threatening human employment

The data analysis demonstrates that *threatening human employment* is the main issue of future career impacts of the widespread use of robots. Initially, almost all the students (26 out of 30) stressed that the widespread use of robots would decrease the number of jobs available for human employees. Moreover, some students (S1, S9, S16, S17, S19, S24, S26, S29) think robotisation would reduce the need for the human workforce. Finally, several students (S2, S3, S6, S7, S17) indicate that robotisation would increase layoffs in the T&H industry.

In this aspect, for instance, S26 remarks that "The widespread use of robots in the T&H industry would affect my career. If robots can do what is expected of me and do what I can, employers will prefer robots over me. This situation would influence our job opportunities in the sector. If there is a robotisation process in the tourism sector, employment opportunities will decrease. As a disadvantage, after further technological development, they will do all the tasks I can do. Therefore, I will be unemployed in the industry".

These findings confirm the previous studies (Seyitoğlu et al., 2021; Vatan & Dogan, 2021) that restaurant and hotel employees have negative attitudes towards service robots as they consider service robots a threat to their jobs. Furthermore, the fear of automation and losing their job is also significant in forming restaurant employees' perceptions of robots (Ghimire et al., 2020).

4.2.2. Reducing the motivation toward working in the industry

Several students (S1, S7, S8, S11, S12, S13, S15, and S17) point out that the widespread use of robots in the T&H industry would reduce their motivation for working in the industry. For example, S1 remarks that her career would be negatively impacted if robotisation is widespread in the T&H sector. She (S1) further explains, "Although robotisation seems logical considering the current pandemic, it is pretty frightening in human career planning . . . Since the robot factor has entered the market, and if the robot employee is preferred, the motivation of human employees begins to decrease. Because human employees will see that their need for the industry decreases, it would damage the motivation of every person who works in the industry". Another participant (S12) purports that "It will not affect our abilities, but it can reduce motivations. If a robot does all the work, it can reduce the possibility of human employees doing the job . . . It seems that they will be better than us in terms of talent. This

gives me motivational discomfort". According to our awareness of the current literature, no study investigating the relationships between the use of service robots and the motivation of tourism and hospitality students towards the industry exist. However, it is indicated that individuals working with service robots might feel less worthy or useless than robots and will become obsolete in the service environment (Seyitoğlu et al., 2021; Smids et al., 2020).

4.2.3. Unfair competition between robots and human employees

A significant number of students (S3, S4, S6, S7, S8, S11, S15, S17, S20, S21, S22, S23, S25, S27, S28, S29) specify that the widespread use of robots in the T&H industry would lead to unfair competition between robots and human employees. In this regard, S3 hints that because of the widespread use of robots in the industry, he would need to develop his skills to compete with them. However, in his view (S3), this is unfair competition as it is easy to programme robots according to the needed skills. S6 underlines the unfair competition with these statements: "I think tourism companies will sometimes compare robots with human workers. This will be unfair competition. Companies will think about which one to use and eventually decide on robots. Employees will have to catch up with the robots. Therefore, I believe that all employees will have difficulties in this situation ... And I also think that this situation will cause anxiety for the employees".

On the other side, some students also think that unfair competition between robots and human employees in the T&H industry would decrease their work performance. For instance, S27 states that "The widespread use of robots in the T&H industry would affect my career. Of course, I will have to improve myself more ... and this situation affects our opportunities to find a job in the sector ... I need to improve myself and develop my skills. This can affect my performance negatively. I can find myself in a constantly competitive position which is unfair. Of course, candidates who are new in the sector like us and who have started to develop themselves compete with robots can cause demoralisation". S8 also stresses the associated view as " ... robots can be many steps ahead of us because various programs can be installed on robots ... this situation would make me anxious. This may also reduce my work performance ... Thus, the widespread use of robots in the tourism sector will finish us. Since we will not have the opportunity to catch many robots' features, this will be unfair competition".

4.2.4. Negative psychological impact/ feeling of being less skilled than robots

Some students (S12, S17, S23, S27) mention the negative psychological impact of the widespread use of robots in the T&H industry: the feeling of being less skilled than robots. Regarding this issue, the participants indicate that robots can cause a feeling of being less qualified than robots. For example, S12 underlines that " ... If robots do all the work, I can no longer feel skilled and valuable for the industry ... It seems that they will be better than us in terms of talent. This gives me psychological discomfort. Since we will not be able to reach robots' qualifications ... I would feel insufficient and less talented". S17 underlines a similar view as " ... with current technological advances, robots may be superior to us in the future ... Of course, we can add something to ourselves in this process. But not as possible as robots. Thus, we can compare ourselves with robots and feel less skilled or useless. In that sense, I could be affected in the future if robots are widespread in the industry. So, this situation could upset me".

4.2.5. Giving up/changing the industry

As the last dimension *giving up/changing the industry* can be considered the most critical career influence of service robots in the T&H sector because students (S7, S11, S13, S15, S21, S23) stress that they could give up or change the industry if the use of robots would be widespread in the industry. In this vein, the expression of one of the students (S7) shaped as "The widespread use of robots in businesses will, of course, affect my career negatively. Why? Because the people will be laid off with the arrival of robots. Thus, I may have to turn to a sector with no robotisation, requiring more human characteristics". S13 similarly expresses that "If I am going to be a tourism employee, I will have to start from the lower positions first. So, for example, considering the F&B department, I can start as a busboy. If I improve myself later, I can be a waiter or a server. Additionally, I can improve myself until reaching the chief executive position in the kitchen. But if firms start using robots, I will probably lose my job, and I will not be able to improve myself. Moreover, the fact that robots have many features (programmable, updateable, etc.) and are still developing would affect my skills and performance in the T&H industry. If they use robots, companies will not hire me . . . In this aspect, I would have to turn to another sector . . . If robotisation is widespread in tourism, for me, it will be inevitable to change the industry".

It is evident from the student's perspectives that the fear of losing their job or would hardly find positions due to the widespread use of service robots in the future, students think that they would change their career paths. However, the future is unknown and recent studies stress the need for human employees in the industry. For example, in some service contexts (i.e., restaurants), suppliers think service robots are unsuitable for restaurant services, especially for tasks requiring communication, emotions, socialising, and cooking skills (Seyitoğlu et al., 2021). Moreover, restaurant patrons state that robots will not address the need for communication and emotions between host guests in restaurants; thus, they will damage restaurant experience quality and naturalness (Seyitoğlu et al., 2021).

5. Conclusion and implications

This study is the first that explores the perspectives of undergraduate T&H students towards working with robots and the career influence of the widespread use of robots. Hence, it contributes to the tourism and hospitality literature by revealing the dimensions of working with robots and the future career impacts of the widespread use of robots (see, Table 2). Besides, the present study presents a model (Figure 1) reflecting the relationships of the dimensions of *future career impacts of the widespread use of robots in the tourism and hospitality industry*.

5.1. Implications

This well-timed study provides several theoretical contributions to the tourism and hospitality literature. First, it is evident from *working with robots in the tourism and hospitality industry* category that most students find the features of service robots advantageous. However, some students found robotics disadvantageous due to the lack of human characteristics such as social interactions with customers and co-workers, human-level communication skills, problem-solving skills, and human teamwork. This result

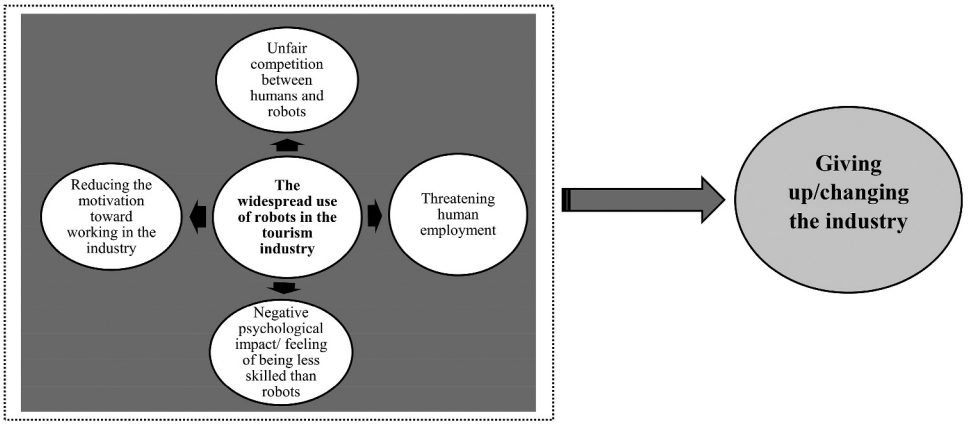

Figure 1. The model of future career impacts of the widespread use of robots in the tourism industry.

demonstrates that the only deficiency in the current robotic technology in tourism services is the human features, especially the communication skills. These findings are consistent with the recent studies (Hanqin Qiu et al., 2021; Ivanov et al., 2020; Seyitoğlu et al., 2021) that the mentioned human-level skills and features are disadvantages of service robots.

Besides, it is prominent from the theme of *willingness to work with or implement robots* that most undergraduate T&H students are optimistic about working with robots. However, the rest of the students who are unwilling to work with robots in the T&H industry mainly mention the reasons related to human features, such as the need for social interactions with co-workers; robots do not have human-level communication skills. In this regard, robotic technology developers should consider this deficiency in service robots because the expressed human features are crucial as they may determine the work efficiency and service quality in the T&H industry. Thus, the companies developing service robots must spend more effort to design more human-level robotics for tourism services. Nevertheless, up to the present, as the findings of a study related to the T&H industry (Reis et al., 2020) imply, in some cases, service robots have not successfully achieved the required technological efficiency to address human-level skills to replace humans in work environments.

The findings also display that almost all students are willing to implement robots when they become a manager in the future. This result demonstrates that the perspectives of the participated students towards service robots (working with or implementing) vary according to their possible future positions. According to these findings, students find service robots logical from a managerial perspective; however, the perception that robots would reduce future tourism employment chances is the main reason they have unfavourable perceptions of working with robots.

The second main category, the *future career impacts of the widespread use of robots*, can be explained with a model (see, Figure 1). According to the participants' statements, it is prominent that the possible widespread use of robots in the T&H industry is considered a threat to human employment in the industry. Moreover, the students believe that this possibility would cause unfair competition between humans and robots, leading to

negative psychological impacts (feeling of being less skilled than robots) and low motivation to work in the industry. These effects would finally result in negative behaviours such as giving up or changing the industry.

In this regard, since technology is developing and being used in the T&H industry, the industry representatives (tourism companies, destinations managers, and policymakers) and educational institutions should work together to think of the best solutions to design the human-technology balance and related strategies for the future of the industry. In addition, considering that undergraduate tourism and hospitality students are the ones who will be future tourism employees and managers, the educational institutions should therefore integrate robotic technological developments into their curriculum. In this aspect, the vocational and theoretical skills are adaptable to automation technology, including robotics (i.e., how to work with high-tech, the new skills that should be obtained, and future scenarios to work in the industry with automation technology). Additionally, automation technologies may eliminate or significantly reduce the number of jobs, reveal new positions, and change work tasks and nature (Ivanov, 2020). Hence, tourism education institutions and industry representatives should consider these issues while designing future initiatives.

Finally, when considering the importance of the number of tourism educational institutions in Turkey and students enrolling in the departments (i.e., tourism management, tourism guiding, gastronomy and recreation) of tourism faculties, many students are trained for the industry to be employed. This study found that some students have negative perceptions of service robots and see them as a threat that can replace their position in the future. Thus, as part of stakeholders, educational institutions should prepare hospitality and tourism students for technological adoption in the industry through their curriculums. Further, the significance of service robots should be adopted into the syllabus of tourism faculties.

5.2. Limitations and future directions

This research focuses on undergraduate T&H students in Turkey. Thus, the findings are generalisable in these contexts only. However, future studies may go further and focus on other countries. Furthermore, research can be based on comparative studies of different countries and adopt quantitative approaches to expand these results. Moreover, studies (both nationally and internationally) can be conducted on the curriculum development of tourism educational institutions in terms of adapting the skills related to automation technologies. Finally, studies can also focus on the future industrial work environment scenarios through workshops or expert panels to be prepared for the future.

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References

Association of Turkish Tourism Academics. (2019). *2019 YKS Turizm Yerleştirme İstatistikleri*. https://tuader.org/2019/09/11/2019-yks-turizm-yerlestirme-istatistikleri/

Belanche, D., Casaló, L. V., & Flavián, C. (2021). *Frontline robots in tourism and hospitality: Service enhancement or cost reduction?*. *Electronic Markets* 31 , 477–492 doi:10.1007/s12525-020-00432-5.

Biron, B. (2019). *Chinese e-commerce giant Alibaba has a hotel run almost entirely by robots that can serve food and fetch toiletries — Take a look inside.* Social Media Asia . https://www.businessinsider.com/alibaba-hotel-of-the-future-robots-ai-2019-10

Chiang, A. H., & Trimi, S. (2020). Impacts of service robots on service quality. *Service Business*, *14*(3), 439–459. https://doi.org/10.1007/s11628-020-00423-8

Fuentes-Moraleda, L., Díaz-Pérez, P., Orea-Giner, A., Muñoz- Mazón, A., & Villacé-Molinero, T. (2020). Interaction between hotel service robots and humans: A hotel-specific service robot acceptance model (sRAM). *Tourism Management Perspectives*, *36*, 100751. https://doi.org/10.1016/j.tmp.2020.100751

Ghimire, R., Skinner, J., & Carnathan, M. (2020). Who perceived automation as a threat to their jobs in metro Atlanta: Results from the 2019 metro Atlanta speaks survey. *Technology in Society*, *63*, 101368. https://doi.org/10.1016/j.techsoc.2020.101368

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: strategies for qualitative research*. Aldine Transaction.

Hilton. (2016). *Hilton and IBM Pilot "Connie," The World's First Watson-enabled hotel concierge*. https://newsroom.hilton.com/corporate/news/hilton-and-ibm-pilot-connie-the-worlds-first-watsonenabled-hotel-concierge

International Federation of Robotics. (2020). *World Robotics 2020*. https://ifr.org/img/office/World_Robotics_2020_Sales_Flyer.pdf

Ivanov, S. (2019). Ultimate transformation: How will automation technologies disrupt the travel, tourism and hospitality industries? *Zeitschrift Für Tourismuswissenschaft*, *11*(1), 25–43. https://doi.org/10.1515/tw-2019-0003

Ivanov, S. (2020). The impact of automation on tourism and hospitality jobs. *Information Technology & Tourism*, *22*(2), 205–215. https://doi.org/10.1007/s40558-020-00175-1

Ivanov, S., Gretzel, U., Berezina, K., Sigala, M., & Webster, C. (2019). Progress on robotics in hospitality and tourism: A review of the literature. *Journal of Hospitality and Tourism Technology*, *10*(4), 489–521. https://doi.org/10.1108/JHTT-08-2018-0087 Emerald Group Publishing Ltd

Ivanov, S., Seyitoğlu, F., & Markova, M. (2020). Hotel managers' perceptions towards the use of robots: A mixed-methods approach. *Information Technology and Tourism*, *22*(4), 505–535. https://doi.org/10.1007/s40558-020-00187-x

Ivanov, S., & Webster, C. (2019a). Economic fundamentals of the use of robots, artificial intelligence, and service automation in travel, tourism, and hospitality. In S. Ivanov & C. Webster (Eds.), *Robots, artificial intelligence and service automation in travel, tourism and hospitality* (pp. 39–55). Emerald Group Publishing Ltd. https://doi.org/10.1108/978-1-78756-687-320191002

Ivanov, S., & Webster, C. (2019b). Perceived appropriateness and intention to use service robots in tourism. In J. Pesonen & J. Neidhardt (Eds.), *Information and communication technologies in tourism 2019* (pp. 237–248). Springer. https://doi.org/10.1007/978-3-030-05940-8_19

Ivanov, S., & Webster, C. (2020). Robots in tourism: A research agenda for tourism economics. *Tourism Economics*, *26*(7), 1065–1085. https://doi.org/10.1177/1354816619879583

Ivkov, M., Blešić, I., Dudić, B., Bartáková, G. P., & Dudić, Z. (2020). Are future professionals willing to implement service robots? Attitudes of hospitality and tourism students towards service robotization. *Electronics*, *9*(9), 1–16. https://doi.org/10.3390/electronics9091442

Joshi, N. (2020). *Bon Appétit! Robotic Restaurants Are The Future/* Forbes. https://www.forbes.com/sites/cognitiveworld/2020/02/03/bon-apptit-robotic-restaurants-are-the-future/?sh=430d22ee2136

Li, F. S., Qi, H., & Guo, Q. (2021). Factors influencing Chinese tourism students' choice of an overseas PhD program. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *29*, 100286 doi:10.1016/j.jhlste.2020.100286.

Lu, L., Cai, R., & Gursoy, D. (2019). Developing and validating a service robot integration willingness scale. *International Journal of Hospitality Management*, *80*, 36–51. https://doi.org/10.1016/j.ijhm.2019.01.005

Mariano, K. (2018). *Robots to take over our airports by 2030*. Travel daily media. https://www.traveldailymedia.com/robots-take-over-airports-by-2030/

Meyer, D. (2017). *Robots may steal as many as 800 million jobs in the next 13 years*. Fortune. https://fortune.com/2017/11/29/robots-automation-replace-jobs-mckinsey-report-800-million/

Murphy, J., Hofacker, C., & Gretzel, U. (2017). Dawning of the age of robots in hospitality and tourism: Challenges for teaching and research. *European Journal of Tourism Research*, *15*, 104–111. https://doi.org/10.54055/ejtr.v15i.265

Olcay, A. (2008). The important education in Turkish tourism. *Gaziantep Üniversitesi Sosyal Bilimler Dergisi*, *7*(2), 383–390. https://dergipark.org.tr/tr/download/article-file/223496 .

Park, S. (2020). Multifaceted trust in tourism service robots. *Annals of Tourism Research*, *81*, 102888. https://doi.org/10.1016/j.annals.2020.102888

Qiu, H., Li, Q., & Li, C. (2021). How technology facilitates tourism education in COVID-19: Case study of Nankai University. *Journal of Hospitality, Leisure, Sport and Tourism Education*, *29*, 100288. doi:10.1016/j.jhlste.2020.100288 .

Qiu, H., Li, M., Shu, B., & Bai, B. (2020). Enhancing hospitality experience with service robots: The mediating role of rapport building. *Journal of Hospitality Marketing and Management*, *29*(3), 247–268 doi:10.1080/19368623.2019.1645073.

Reis, J., Melão, N., Salvadorinho, J., Soares, B., & Rosete, A. (2020). Service robots in the hospitality industry: The case of Henn-na hotel, Japan. *Technology in Society*, *63*, 101423. https://doi.org/10.1016/j.techsoc.2020.101423

Rezaei, N., Ghaderi, Z., & Ghanipour, M. (2022). Heritage tourism and place making: investigating the users' perspectives towards Sa'd al-Saltaneh Caravanserai in Qazvin, Iran. *Journal of Heritage Tourism*, *17*(2), 204–221. doi:10.1080/1743873X.2021.1998076.

Seyitoğlu, F., & Ivanov, S. (2020a). A conceptual framework of the service delivery system design for hospitality firms in the (post-)viral world: The role of service robots. *International Journal of Hospitality Management*, *91*, 102661. https://doi.org/10.1016/j.ijhm.2020.102661

Seyitoğlu, F., & Ivanov, S. (2021). Service robots as a tool for physical distancing in tourism. *Current Issues in Tourism*, *24*(12), 1631–1634. https://doi.org/10.1080/13683500.2020.1774518

Seyitoğlu, F., & Ivanov, S. (2022). Understanding the robotic restaurant experience: A multiple case study. *Journal of Tourism Futures*, *8*(1), 55–72 doi:10.1108/JTF-04-2020-0070.

Seyitoğlu, F., Ivanov, S., Atsız, O., & Çifçi, İ. (2021). Robots as restaurant employees - A double-barrelled detective story. *Technology in Society*, *67*, 101779. https://doi.org/10.1016/j.techsoc.2021.101779

Shewan, D. (2017). *Robots will destroy our jobs – And we're not ready for it*. The Guardian. https://www.theguardian.com/technology/2017/jan/11/robots-jobs-employees-artificial-intelligence

Shin, H. H., & Jeong, M. (2020). Guests' perceptions of robot concierge and their adoption intentions. *International Journal of Contemporary Hospitality Management*, *32*(8), 2613–2633. https://doi.org/10.1108/IJCHM-09-2019-0798

Smids, J., Nyholm, S., & Berkers, H. (2020). Robots in the workplace: A threat to—or opportunity for—Meaningful work? *Philosophy & Technology*, *33*(3), 503–522. https://doi.org/10.1007/s13347-019-00377-4

Tasci, A. D. A., & Semrad, K. J. (2016). Developing a scale of hospitableness: A tale of two worlds. *International Journal of Hospitality Management*, *53*, 30–41. https://doi.org/10.1016/j.ijhm.2015.11.006

Tuomi, A., Tussyadiah, I. P., & Stienmetz, J. (2021). Applications and implications of service robots in hospitality. *Cornell Hospitality Quarterly*, *62*(2), 232–247. https://doi.org/10.1177/1938965520923961

Turkish Statistical Institute (TUIK). (2021). *Eğitim, Kültür, Spor ve Turizm*. https://data.tuik.gov.tr/Kategori/GetKategori?p=Egitim,-Kultur,-Spor-ve-Turizm-105

Vatan, A., & Dogan, S. (2021). What do hotel employees think about service robots? A qualitative study in Turkey. *Tourism Management Perspectives*, *37*, 100775. https://doi.org/10.1016/j.tmp.2020.100775

Wakelin-Theron, N. (2021). Illustrating the perception of students towards autonomous service robots in the tourism industry: An exploratory study. *Tourism and Hospitality Management*, *27* (2), 385–406. https://doi.org/10.20867/thm.27.2.7

Yıldırım, H. M., Çeti, B., Özcan, S., Dülgaroğlu, O., & Özer, F. (2016). Turizm Sektöründe Hizmet Kalitesinin Sağlanması Açısından Türkiye'de Turizm Eğitiminin Analizi. *Karabük University Journal of Institute of Social Sciences*, *6*(6–2), 446–455. https://doi.org/10.14230/joiss273