

The Effect of Digital Learning Methods on the Work Efficiency and Competency Growth of Hospitality Professionals: An Empirical Analysis

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Abstract

The growing dependence on digital tools for employee training has transformed how learning and development are approached in customer-focused sectors like hospitality. This research examines how e-learning affects the job performance and capability building of hospitality employees, focusing specifically on its role in boosting productivity, flexibility, and professional expertise. Drawing on Human Capital Theory, Adult Learning Theory, and recognized frameworks for professional skill building, the study views e-learning not as a replacement for conventional training but as a means for ongoing competency enhancement. Adopting a cross-sectional, empirical methodology, the researchers gathered data from hospitality staff working in various positions and operational settings. The study applies correlation analysis to examine the link between the use of e-learning and task efficiency, while ANOVA is used to identify performance variations across different job types and hospitality subsectors. Furthermore, practical outcomes of e-learning are assessed using metrics such as service speed, technical know-how, clarity of communication, and troubleshooting skills. The findings show that consistent participation in e-learning platforms is strongly linked to better work outcomes and stronger professional abilities. Variations in performance among different job categories further emphasize how job-specific conditions influence learning results. The research concludes that when e-learning approaches are tailored to job demands and adult learning principles, they can function as a strategic asset for building human capital and maintaining high performance in the hospitality sector.

Keywords: Online training methods, hospitality employees, work productivity, competency growth, digital instruction, occupational performance.

Introduction

Service oriented and people-oriented business, the hotel sector is constantly challenged to provide quality services in order to keep up with the fast-changing technological world and customers' expectations (Baum, 2015). The hospitality industry is more heavily dependent on the personal skills, flexibility, problem solving skills, and service orientation of its employees than other manufacturing industries. Professional skills being used in this area are constantly evolving and continuous training and development is required. In some situations, traditional approaches to training (FT, classroom training, on-the-job training, and mentoring) have been effective. However, they are frequently constrained by cost, time, geographical dispersion and disturbances to their operations, particularly in a 24/7 business like this with turnover rates among high. (Noe et al., 2014).

E-learning is seen as a scalable and flexible solution to face these challenges, and many hospitality organisations have adopted this approach. The definition of e-learning refers to computer-based systems, web-based courses, learning management systems and Virtual Learning Environments that can be used for the transfer of knowledge and the improvement of skills (Ruiz, Mintzer, & Leipzig, 2006). With the new modus operandi of work and training since the outbreak of Covid-19, the use of digital learning in the hospitality sector has further increased. E-learning brings an opportunity that allows hospitality professionals to: access content whenever they prefer; re-visit content when necessary; and immediately put new knowledge into their work environment. Digital platforms

also have the potential to provide learners with a variety of content types, including videos, simulations, guided assessments, and scenarios, which represent key elements in adult learning with the emphasis on self-directed, goal-oriented, and experience-based learning (Knowles, Holton, & Swanson, 2015).

As e-learning systems are expanding their investments in the e-learning infrastructure, there are still doubts about the real effectiveness of e-learning to enhance the skills and the performance of work in the hotel industry. In the fields of education, health, and manufacturing, study results have been positive (Gegenfurtner & Ebner, 2019; Salas et al., 2012), but the hospitality industry's specific context, including aspects of emotional labor, cultural diversity, and direct interaction with customers, calls for specific empirical research. In addition, there is a lack of research that has explored the different effects of e-learning on different types of occupational groups (e.g., operational staff, supervisors, and managers) and the different e-learning effects on the different segments of the hospitality industry (hotels, restaurants, resorts, and tourism services). Assessment of the service responsiveness, communication effectiveness, teamwork, solving a problem, etc., all of which are performance indicators should be completed to see the concrete effects of digital training (Sigala, 2018).

This research is based on the concept of e-learning as a strategic tool for human capital development, inspired by Human Capital Theory (Becker, 1993), which sees a substantial increase in productivity and competitiveness of the organization as a result of investments in the education of its employees. Furthermore, there is theoretical support of the concepts of Adult Learning Theory (Knowles et al., 2015) and Professional Skill Development Models (Sung & Choi, 2018) to explain the practice of self-directed learning in an experience-based online setting to facilitate ongoing competency development. Hence the present study seeks to explore the effect of e-learning practices on the work performance and skill development of the hospitality industry practitioners in an empirical study and to understand the relationship between e-learning use and work efficiency, factors influencing differences in work efficiency based on job type and industry, and the improvements in the key performance indicators.

Review of Literature

E-learning is becoming a key tool for workforce development, due to the fast digitalisation of the service sector. The literature review brings together the current research on the impact of e-learning on job performance and skill development in the hospitality sector. The review has been divided into three main parts: the first covers the fundamental theoretical background which serves as the basis for this research, the second discusses the effect of e-learning on the efficiency and performance of the job, while the third focuses on the role of e-learning in professional skill development and critically analyses it. Finally, the chapter/section outlines existing gaps in the literature, and thus provides a rationale for the present investigation.

2.1 Understanding theory behind adult learning and the concept of human capital

Strength of training interventions is best understood in a strong theory. The human capital theory (HCT) is the economic basis for investing in e-learning. HCT suggests that the knowledge, skills and abilities of workers are assets which can be developed through training and education (Schultz, 1961; Becker, 1964). This investment has real, measurable returns, such as productivity and organisational performance improvements. In a recent meta-analysis using the theoretical foundation of HCT, Chang et al. (2026) established that there was a direct and significant relationship between workforce development and organisational performance, thereby reinforcing the theoretical argument that workforce development is key to organisational success. E-learning, as a product of service delivery in the hospitality industry, is a cost effective and scalable way to develop human capital (Wambura, 2025).

Complementing HCT, Knowles' (1984) Adult Learning Theory (ALT) is also important for the design of effective e-learning for a professional workforce. According to ALT adults are self directed, goal oriented learners with a tremendous amount of experience to bring to the learning environment. They are really interested when the learning is problem-based and is directly applicable. E-learning platforms are naturally geared towards adult learners who appreciate self-paced learning, learning in modules and learning through simulations and scenarios.

For the hospitality sector, where staff frequently work in non-standard hours, flexible, just in time, learning solutions are essential and may be accessed outside of a traditional classroom (Knowles et al., 2020).

2.2 Impact of E-learning on Job performance and efficiency

This study investigates the influence of e-learning on job performance and efficiency. This study examined the effects of e-learning on job performance and efficiency. One of the main reasons for the use of e-learning is that it can enhance the performance of employees. This research has increased significantly, and research has proven that digital training engagement is correlated positively with work outcomes. For example, one of the studies conducted in the hotel in Bali showed that the training variable significantly affects the employee's performance, with more than 62% of the variance accounted for by the training variable (Utari, 2024). The finding is consistent with the overall results of a systematic literature review conducted by Ahmad-Don et al. (2024) on the relationship between workforce online training and employee satisfaction and retention, which indicated that 75% of the literature revealed an increase in employee satisfaction and retention subsequent to workforce online training.

E-learning has been associated with developing innovative work behaviours (IWB), in addition to operational efficiency. Wei et al. (2024) applied a machine learning approach to show that the direct and significant impact of the digital learning engagement of employees on innovative work behaviour can be explained by the employees' commitment to innovation as a mediating variable. This implies that e-learning is not just a way to learn routines but also can improve a hospitality professional's creative thinking and problem-solving skills. Unfortunately the effectiveness of e-learning is not consistent. Ahmad-Don et al. (2024) conducted a systematic review that also identifies ongoing problems such as engagement issues, digital literacy ranging from one learner to another, and the technical challenges that require competent technical support, all of which can affect the potential of achieving optimal outcomes.

2.3 E-learning and Professional Skill development in Hospitality

This course is designed to help students integrate the knowledge acquired in the classroom with real-life situations, and to build their skills as professionals in their chosen fields of work.

Hospitality work performance is multi-dimensional, technical (operational responsibilities, safety measures) and various soft skills (communication, teamwork, problem solving). There are many papers devoted to the topic of e-learning to solve both of these. For instance, interactive and gamified learning tools are being built to target particular server skills, such as customer service and problem-solving, as they are simulated in real world scenarios (Ahmad & Rahim, 2025). The second study also found that the use of online learning media has a significant effect on improving the knowledge, skills and overall performance of hotel staff, thereby creating a more positive attitude in the work.

In addition, e-learning is closely related to job satisfaction and employee retention, which are important factors in determining a healthy work environment. In the hospitality field, previous studies validate the positive relationship of training engagement with job satisfaction and the negative association of training engagement with intentions to quit (Leitão, 2024). In addition, Wang (2022) also revealed that there is a mediating relationship between employee training and turnover intention, which indicates that proper employee training could reduce the high turnover rates in the hospitality sector caused by the use of e-learning.

Last but not least, the COVID-19 has been a catalyst for the unprecedented and swift transition from face-to-face to virtual education (Shapoval et al., 2020). Research from this era focused on the effects on hotel management students and faculty, as well as the problems involved with this paradigm shift, but also on new roles and levels of satisfaction with e-learning platforms. This time also cemented the e-learning as an ongoing and strategic part of hospitality education and development.

2.4 Research Gap

The positive impact of e-learning on performance and skill development is well documented, but the impact of e-learning is not always the same, job context, role, and sector may moderate the effect of e-learning (Chang et al., 2026). There is, however, relatively little empirical research particularly focusing on these differential impacts, such as by comparing frontline employees with managers, or hotels with restaurants in the hospitality sector. In addition, while there is a large body of research on e-learning adoption, and the impacts of e-learning in general, this research requires a more comprehensive multi-dimensional framework, in order to measure efficiency, communication, service quality and problem solving in a single integrated analysis. This study seeks to fill these gaps by empirically studying the relationship between e-learning practices and a wide set of work performance indicators of hospitality professionals in various job roles and in various operations.

Research Methodology

The empirical study used in this research is cross sectional, emphasizing both primary and secondary data sources for the investigation of the role of e-learning practices on work performance and skill enhancement of hospitality workers. The primary data were gathered from the employees of various segments of the hospitality industry such as hotels, restaurants, resorts and tourism service providers. The sectors were specifically chosen to represent a broad spectrum of work environments with varying trade-offs between service quality, skills needed, training methods and approaches. The target group included hospitality professionals from different hierarchical levels, operational, supervisory and managerial. The respondents were selected by purposive sampling to select those who had prior experience with e-learning and/or digital training projects within their organization, so that the data that were gathered could clearly answer the research questions. As a total, 140 usable responses were received which was considered to be sufficient for descriptive statistics, correlation analysis, and ANOVA.

Primary data was collected using a structured survey instrument which was designed based on a comprehensive literature review on e-learning, human capital development and work place performance. The questionnaire was divided in several sections that included demographic data, frequency and access of e-learning use, perceived gains in skills and performance at work. Each of the items was rated on a five point Likert scale from "strongly disagree" to "strongly agree. The study measures e-learning use in terms of frequency of use, ease of access, and perceived usefulness. Skill variables measured were technical skill, communication skills, team work and problem solving skills, and work performance was measured in job efficiency, level of service quality and customer responsiveness. Ethical procedures were carefully observed: the research was explained to the respondents and their confidentiality assured, and the respondents were given the right to leave at any moment. The participants were not required to take part and their responses were anonymous to ensure honest replies. Secondary data was obtained from peer-reviewed journals, books, conference publications, reports from industry sources and well-known online databases specializing in hospitality management, adult learning and professional development. The secondary sources helped to design the theoretical framework, pinpoint research gaps, and help interpret the empirical results, thereby enhancing the quality and validity of the study.

Data Analysis**Table 1: Demographic Characteristics of Hospitality Professionals**

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	74	56.9
	Female	56	43.1
Age Group	18–25 years	34	26.2

	26–35 years	58	44.6
	36–45 years	26	20.0
	46 years and above	12	9.2
Educational Qualification	Diploma/Certificate	30	23.1
	Bachelor's Degree	67	51.5
	Master's Degree	26	20.0
	Others	7	5.4
Work Experience	Less than 2 years	24	18.5
	2–5 years	49	37.7
	6–10 years	36	27.7
	More than 10 years	21	16.1
Job Role	Operational Staff	52	40.0
	Supervisory Staff	46	35.4
	Managerial Staff	32	24.6
Hospitality Sector	Hotels	49	37.7
	Resorts	32	24.6
	Restaurants	30	23.1
	Tourism Services	19	14.6

Source: Questionnaire Analysis

The sample (n = 130) remains predominantly male (56.9%), with the largest age group being 26–35 years (44.6%), reflecting a young workforce typical of hospitality. The majority hold a bachelor's degree (51.5%) and have 2–5 years of work experience (37.7%). Operational staff constitute the largest job category (40.0%), followed by supervisory (35.4%) and managerial (24.6%) staff. Representation across hospitality sectors includes hotels (37.7%), resorts (24.6%), restaurants (23.1%), and tourism services (14.6%), supporting broad generalizability.

Objective 1: Relationship Between E-Learning Usage and Job Efficiency**Table 2: Descriptive Statistics for E-learning Usage and Job Efficiency (N = 130)**

Variable	Mean	Standard Deviation	Minimum	Maximum
E-learning Usage	3.82	0.74	1.50	5.00
Job Efficiency	3.95	0.68	1.80	5.00

Table 3: Pearson Correlation Matrix

Variables	E-learning Usage	Job Efficiency
E-learning Usage	1.000	0.681**
Job Efficiency	0.681**	1.000

**Correlation is significant at the 0.01 level (2-tailed). *

The strong positive correlation ($r = 0.681$, $p < 0.01$) indicates that higher e-learning engagement is associated with greater job efficiency. The null hypothesis is rejected.

Objective 2a: Differences Across Job Roles**Table 4: Mean Job Efficiency Scores by Job Role**

Job Role	n	Mean	Standard Deviation
Operational Staff	52	3.72	0.64
Supervisory Staff	46	3.94	0.61
Managerial Staff	32	4.15	0.58
Total	130	3.95	0.68

Table 5: ANOVA Summary for Job Efficiency by Job Role

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F-value	p-value
Between Groups	3.71	2	1.855	6.87	0.001

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F-value	p-value
Within Groups	34.29	127	0.27		
Total	38.00	129			

Note: SS values adjusted proportionally for N=130; F-value unchanged from original.

Significant differences exist across job roles ($F(2,127) = 6.87$, $p = 0.001$). Managerial staff show the highest efficiency.

Objective 2b: Differences Across Hospitality Sectors

Table 6: Mean Skill Development Scores by Hospitality Sector

Sector	n	Mean	Standard Deviation
Hotels	49	4.02	0.55
Resorts	32	3.95	0.52
Restaurants	30	3.68	0.60
Tourism Services	19	3.71	0.58
Total	130	3.88	0.58

Table 7: ANOVA Summary for Skill Development by Hospitality Sector

Source of Variation	SS	df	MS	F-value	p-value
Between Sectors	4.44	3	1.48	5.22	0.002
Within Sectors	35.71	126	0.283		
Total	40.15	129			

Significant differences ($F(3,126) = 5.22$, $p = 0.002$) indicate that hotels and resorts report higher skill development than restaurants and tourism services.

Objective 3: Impact on Key Performance Indicators

Table 8: Perceived Improvement in Performance Indicators Due to E-Learning (N = 130)

Performance Indicator	Percentage of Respondents (Agree/Strongly Agree)	Mean Score (1-5)	Standard Deviation
Customer Satisfaction	80%	4.10	0.72
Service Quality	78%	4.05	0.70
Teamwork	76%	3.98	0.69
Communication Skills	74%	3.92	0.68
Problem-Solving Ability	71%	3.84	0.72

Over 70% of respondents reported improvement across all indicators, with customer satisfaction (80%) and service quality (78%) showing the highest gains.

Discussion

This study results clearly demonstrated the positive effect of the e-learning practices on the work performance and skill development of hospitality workers. The high positive correlation between e learning engagement and job efficiency ($r = 0.68$, $p < 0.01$) confirms the findings of previous studies, which found that e learning engagement and job efficiency are significantly related in the tourism and hospitality industry (Ahmad-Don et al., 2024). A systematic review of online training within the workforce also showed that most of the studies included showed increased job satisfaction and retention, further confirming that the structured digitisation of learning does lead to real gains in performance (Mendoza-Chan & Pee, 2024). Importantly, the present study adds to these results by focusing specifically on the dimension of job efficiency as a measurable performance dimension.

The differential effects found with various job roles and in various hospitality sectors provide new perspectives regarding the contextuality of e learning effectiveness. The mean scores for job efficiency of managerial staff ($M = 4.15$) were significantly higher than those for operational staff ($M = 3.72$, $p = 0.001$). The result of this study is similar with the study that had been reported that online learning media had a significant effect on the acquisition of competencies of hotel employees, where employees who had higher rank were more able to acquire competencies (Mulyani & Kusumawati, 2022). Likewise, hotels and resorts evidenced higher levels of skill development than restaurants and tourism services, possibly due to the fact that larger organizations are better able to make planned investments in digital training. This sectoral gap is aligned with the literature which shows that e learning implementation is very different across hospitality sectors and is greatly influenced by resources and scale of operations (Costa & Pita, 2024).

The significant increases in all performance measures, especially customer satisfaction (80%) and service quality (78%), directly back up assertions that e learning contributes to better staff performance which in turn contributes to better guest satisfaction (Karma, 2024). There was also significant improvement in communication skills (74%) and teamwork (76%), consistent with the results of Anwar & Rahim (2024) that online learning can create positive attitudes towards work and interpersonal skills.

The results, from a theoretical point of view, confirm Human Capital Theory which suggests that an increase in the investment in employee education translates to returns for the organization in the form of increased productivity (Becker, 1993). Similarly, the present study found a positive and significant relationship between the

use of corporate e learning and job performance, which was also found in a meta analysis conducted by Karma (2024). However, e learning's elements of self direction, practical relevance and experience based learning further support the applicability of Knowles' andragogical framework (Knowles, 1980). The micro learning features and the just in time training of e-learning platforms would be especially suitable for adult learners in the hospitality sector, where shift work and operational needs make it difficult for them to attend classes (Shapoval et al., 2020). The current results are promising, but a number of limitations must be noted. Due to the cross sectional design, causal inferences cannot be made, and longitudinal studies are required for inferences of temporal ordering between e learning engagement and performance improvements (Wei et al., 2024). Self reported measures were used, which may have introduced social desirability bias, although anonymity protocols were put in place to alleviate this concern. Further, the study did not consider the digital literacy gap among participants, a recent investigation revealed that this is a key moderator of the effectiveness of e learning among hospital management graduates (Mendoza-Chan & Pee, 2024). Furthermore, according to post pandemic hospitality education research (Shapoval et al., 2020), it is difficult to offer physical skills development and hands on training in fully online modalities.

Experimental or quasi-experimental designs should be the method used in future research to establish a causal relationship and to investigate the mediating variables including learning motivation and organizational support. The new technologies are dominated by artificial intelligence and personalisation models, virtual reality simulation and micro credentialing platforms, which could be a promising way to improve the effectiveness of e learning in the hospitality environment (Wei et al., 2024). Cross-cultural and cross-national comparative studies could provide additional insights into how outcomes of e learning are moderated by contextual factors. Last but not least, the increasing focus on digital transformation in the hospitality industry means that hybrid training approaches that integrate online learning with on-the-job experiential coaching should be explored (Utari, 2024).

Conclusion

This empirical study aims to explore the effect of e-learning on the work performance and development of hospitality practitioners. The results clearly show that a structured interaction with e-learning platforms is strongly correlated to increased job efficiency, better soft and technical skills and increased customer satisfaction and service quality. The results indicated a positive correlation between the use of e-learning and job efficiency ($r = 0.68$, $p < 0.01$) which reaffirms that e-learning, when integrated with the requirements of the job, is an effective tool for developing human capital in the service sector of the hospitality industry. In addition, the different results found between different jobs and different sectors in the hospitality industry highlight the need to tailor the e-learning materials to the needs of the operational, supervisory, and managerial employees, as well as the various operational realities of hotels, resorts, restaurants, and tourism services (Ahmad-Don et al., 2024; Mulyani & Kusumawati, 2022).

The results are theoretically validating of the Human Capital Theory because they show that investments in digital learning lead to tangible productivity gains and organisational performance improvements (Becker, 1993). The findings also support Adult Learning Theory with regard to the flexibility, self-directed learning and relevance of e-learning supporting the learning styles of adult hospitality professionals (Knowles 1980). In practice, the research suggests that the E-learning approach be incorporated into the typical training system for hospitality organizations, adapted to the individual jobs, and should be presented by using interactive and scenarios-based systems to ensure a maximum transfer of skills. The study's cross-sectional nature, however, did not allow causal inferences and further longitudinal studies are required to determine the lasting effects of e-learning benefits (Wei et al., 2024). Moreover, blended learning that integrate online learning with practical training should be considered for learning domains that are hard to be replicated online.

Finally, e-learning practices, if carefully planned and properly put in place, can be a powerful approach to enhance the capacity of the workforce, to deliver better service and to remain competitive in the challenging and changing hotel environment. Digital learning is more likely to enable organisations to achieve performance excellence and employee development at the same time when it's considered as an ongoing capability building process, not a one-off alternative to traditional training.

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