

Examining the effects of organizational readiness dimensions and extrinsic motivation on the continuance intention to use e-learning innovations

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ABSTRACT

The purpose of this study was to examine the effects of key organizational readiness dimensions and extrinsic motivation on the teaching staff's intention toward the continued voluntary use of e-learning innovations post COVID-19 pandemic. These effects have not received considerable focus in the extant e-learning literature. To mitigate this lack, an integrated model encompassing dimensions from several organizational readiness frameworks and a motivational theory was developed. The model postulated these dimensions as direct determinants of the e-learning innovations continuance intention. A structured questionnaire-based survey was conducted to empirically assess the developed model. The intended population for this survey was composed of teaching staff at a Saudi higher education institution characterized by a wide adoption of e-learning innovations during the pandemic. The 233 valid responses obtained from this population were analyzed using the structural equation modeling method. The results indicated that only two organizational readiness dimensions (i.e., teaching staff readiness and administrative support) and extrinsic motivation were significant positive drivers of the continuance intention to use e-learning innovations. According to these findings, the study emphasizes that the key e-learning stakeholders should develop effective policies and procedures that reinforce the roles of the examined dimensions in promoting such continuance intention, which represents a crucial indicator for the successful implementation of the adopted innovation.

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1. Introduction

Many organizations across the globe were enforced to undertake substantial changes to cope well with the COVID-19 pandemic restrictions and consequences (e.g., lockdown, isolation, quarantine, and movement constraints) and maintain their productivity during the emergency (De Vincenzi *et al.*, 2022). This led to the change of a considerable part of business models and processes to avoid the discontinuity of offered services or transactions, especially in the service sectors that were severely affected by the pandemic restrictions, such as education (Gregurec *et al.*, 2021). An obvious facet of implementing this change in these sectors was relying on not widely used methods of doing business, before the pandemic, as a major means for services delivery during the pandemic. A representative example of these methods is full-time remote work, which is a flexible work arrangement (Wang *et al.*, 2021) that involves greater use of technology (De Vincenzi *et al.*, 2022). This work method shifted from being a choice in a few types of jobs to an obligatory way of work in many industries in the pandemic era (Jaiswal *et al.*, 2022). It was implemented during the pandemic lockdown using diverse innovative technologies, including collaboration tools and video conferencing platforms (Al-Habaibeh *et al.*, 2021).

Such methods were extensively used by the education services sector in the pandemic era by largely replacing the traditional teaching strategies and student performance assessment methods with those enabled by the e-learning innovations. The most widely used types of these innovations during the pandemic include learning management systems, such as Blackboard and Moodle (Turnbull *et al.*, 2021), and video conferencing tools, comprising Zoom, Microsoft Teams, and Google Meet (Lata

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and Gupta, 2021). As such, the core educational processes (i.e., teaching, learning, and assessment) experienced an unprecedented shift to such e-learning platforms due to the pandemic (Zine et al., 2023). Hence, the pandemic period witnessed a great and rapid digital transformation of educational service provisions in many academic institutions around the world through the obligatory adoption of e-learning channels. Such forced digital transformation was the only viable choice to prevent the entire closure of these institutions due to the pandemic (Turnbull et al., 2021). However, this forced digital transformation was certainly associated with the mandatory usage of such innovations by most of the key stakeholders in the education sector, including teaching staff and students. For instance, teaching staff were obliged to deliver classes online via some form of online delivery system (Do et al., 2022) and perform tasks related to creating lessons, assignments, and assessments appropriate for online education (Winter et al., 2021). This indicates that the intention of these stakeholders, especially the teaching staff, toward the continued voluntary use of these innovations post the pandemic period, as well as the factors driving this intention, are not yet well known. The need to obtain such knowledge was also reflected by (Acharjya and Das, 2022) through highlighting the tendency of researchers to predict a crucial outcome of this intention, which is the actual continued use of these innovations by teachers and learners after the pandemic. Among these researchers, Marandu et al. (2023) and Prasetyanto et al. (2022) focused on the learners' perspective to determine the factors predicting such post-pandemic intention. Obtaining insights about these factors is necessary for academic institutions to set the required actions to promote the voluntary use of these innovations in the post-pandemic stage. Also, the necessity to explore these factors stems from the presence of countries that were influenced by the benefits of e-learning to extend the use of these innovations even after the pandemic (Prasetyanto et al., 2022).

As a response to this necessity, the present study focuses on exploring how a set of crucial facilitators of the adoption and usage of e-learning innovations can effectively contribute to drive the post-pandemic intention toward the continued voluntary use of these innovations. These facilitators include five dimensions of organizational readiness (i.e., teaching staff readiness, technical readiness, process readiness, financial readiness, and administrative support) and extrinsic motivation to implement e-learning innovations. They represent important aspects of e-learning that must be considered in an organizational setting because this type of learning is much more than just courses and content for individuals (Haney, 2002). Instances of such aspects include the availability of resources, support, and motivation needed for implementing e-learning. The five facilitators representing organizational readiness dimensions are among those found in multiple measurement models devoted to assessing the readiness for e-learning implementation (Schreurs & Al-Huneidi, 2012). This can be attributed to their obvious roles in determining the extent of preparation specifically for the e-learning implementation and in shaping the overall organizational readiness for change in general. Consequently, these facilitators have been considered in the present study due to their high potential to be always among the major augmenters of both organizational and individual readiness to change the conventional academic processes and practices and accept the innovative methods and tools of e-learning in the educational sector. Moreover, each of these facilitators can act as a key success factor for implementing an e-learning initiative, achieving its anticipated valuable outcomes, and developing the sustainability of educational processes. In this sense, Schreurs and Al-Huneidi (2012) included that the readiness for e-learning is essential to guarantee the achievement of such gains as well as to overcome the barriers linked to its implementation. Hence, these facilitators are greatly expected to increase the confidence of education stakeholders in obtaining a value (e.g., strategic and functional benefits) from accepting and supporting the implementation of this change in a way that contributes to their continuance use of these educational innovations. Therefore, the theoretical research model developed in this study designated each of these facilitators as a direct driver of the continuance usage intention of e-learning innovations post the pandemic.

The evaluation of the developed model was carried out based on the perspective of a crucial category of e-learning stakeholders, which is the teaching staff. Although the importance of this category is well known as a main driver for the successful implementation of the core education processes (e.g., teaching and assessment) on the innovative platforms of e-learning, its intention toward such post-pandemic use was not paid a considerable attention in the previous researches. This is evident from the phenomenon that most of the previous studies only took into account the views and opinions of the students for such evaluation (e.g., Marandu et al., 2023; Prasetyanto et al., 2022). Accordingly, the population of this study was constituted by teaching staff rather than students. The perspective of these teaching staff about the postulated effects in the research model was captured in the Saudi context, which was one of the environments that enabled a rapid transition from the ordinary learning approach to e-learning in response to the pandemic restrictions (Oraif & Elyas, 2021). This transition actually occurred in the middle of the second semester of the academic year 2019-2020 as a result of the suspension of traditional education in all local academic facilities, which was announced by the Saudi Ministry of Education (MOE) to be effective from March 9, 2020 (Ministry of Health, 2020). Considering the higher education sector, the statistics related to this transition indicated that it was implemented in 61 universities and colleges nationwide, with more than 35 million educational sessions provided to more than 1.4 million learners by 76 thousand faculty members (Alkabaa, 2022). This heavy implementation of e-learning designates the Saudi environment as an appropriate context for exploring the factors driving the intention toward the continued voluntary use of such learning post the pandemic.

Within this context, Prince Sattam bin Abdulaziz University (PSAU) was considered as a source for obtaining the perspective of the teaching staff category. PSAU is a large public higher education institution that adopted effective e-learning platforms during and post the pandemic. Since the beginning of the suspension of all on-campus educational activities in Saudi Arabia (i.e., on March 9, 2020 – (Ministry of Health, 2020)), the teaching staff on the campuses of this university used a comprehensive learning management system (i.e., Blackboard) heavily to deliver online classes and carry out the student performance assessments (e.g., assignments or exams). This is in addition to their use of popular video conferencing platforms

(e.g., Zoom) to perform some of these academic activities and hold meetings. As such, these teaching staff own the capability to provide credible feedback on their intention to voluntary use e-learning innovations and the factors influencing such intention as well.

The aforesaid illumination indicates that the pivotal research question investigated in this study is: Do the organizational readiness dimensions and extrinsic motivation contribute to driving the teaching staff's intention toward the continued voluntary use of e-learning innovations in the post-pandemic era?.

2. Literature Review

This section provides a literature review for the organizational readiness for IT innovations implementation and the specific dimensions constituting it in the e-learning context. Afterwards, it presents the fundamental aspects of extrinsic motivation and the continuance usage intention of technological innovations.

2.1 Organizational readiness for IT innovations implementation

The concept of organizational readiness for an IT innovation implementation was characterized in the IT literature in terms of several facets, including the ability to successfully adopt, utilize, and gain a value from this innovation (Ogunyemi and Johnston, 2012) as well as the availability of organizational resources for adopting such innovation (Sihotang et al., 2024). Lokuge et al. (2019) related this readiness concept to assessing “*the organization state of being prepared for effective production or adoption, assimilation and exploitation of digital technologies for innovation*”. From a practical view, it was described as the degree to which the organization has established the employee skills, resources, and other factors necessary for the implementation project to proceed without difficulties or problems (Ahmadi et al., 2015). Such readiness was highlighted in many studies as a crucial determinant for ensuring successful implementation of IT innovations in organizations (Snyder-Halpern, 2001; Lokuge et al. 2019). It consists of multiple dimensions that constitute the degree to which an organization can undertake the entire innovation implementation process with low failure possibilities. These dimensions comprise the readiness of diverse essential objects in the organization context, such as knowledge, staff skill, resources, technology, and processes (Snyder-Halpern, 2001; Levkoff, 2006).

Knowledge readiness is related to understanding the innovation implementation issues. Staff skill readiness is determined by assessing multiple human traits, including technology background and skill level, prior experience with the technological innovation, and extent of involvement in the innovation implementation process. Resource readiness is mainly about the availability of organizational resources (e.g., financial assets and technical support) needed for carrying out the implementation process. Technical readiness specifically reflects the capability of the extant organization's hardware and software technologies to support the innovation implementation (Snyder-Halpern, 2001; Levkoff, 2006). Process readiness encompasses the close match between the characteristics of a technological innovation and the processes currently carried out in the adopting organization (Snyder-Halpern, 2001). Many studies highlighted the importance of several of these dimensions and others (e.g., Lokuge et al. (2019) and Tarafdar and Vaidya (2007)). Among the other dimensions, Tarafdar and Vaidya (2007) included the availability of managerial resources as a key factor determining the organizational readiness for IT adoption. This dimension of managerial resources is related to the degree of management understanding and support for the IT implementation.

2.1.1 Organizational readiness for e-learning implementation

As e-learning represents a crucial innovation in the IT area, several studies included dimensions for the organizational readiness for its implementation. Among these studies, Saekow and Samson (2011) identified five key dimensions for judging the institutions' readiness for e-learning in Thailand's higher education: policy, technology, finance, human resource, and infrastructure. These dimensions are mainly about having necessary elements for implementing e-learning, including strong support from senior management with a clear implementation strategy, technical skills of stakeholders, financial support and long-term budget planning, staff awareness of e-learning adoption, and technological infrastructure, respectively. Similarly, Alshammari (2019) indicated that five dimensions can serve as appropriate measures for e-learning readiness in another context (i.e., the higher education institutions in Saudi Arabia). These dimensions are management, technology, administrative and resource support, interface design (i.e., related to content design), and pedagogy (i.e., comprises linking content to desired outcomes). Also, Nwagwu (2020) found that the e-learning readiness of Nigerian universities is significantly influenced by five factors: ICT equipment readiness, training readiness, public/society readiness (i.e., linked to the environment within which the implementation carried out), financial readiness, and e-learning content readiness.

Focusing on assessing the organizational readiness for e-learning in specific schools in the Philippines, Edralin and Pastrana (2021) used seven dimensions: Student, teacher, content, technology, administrative support, financial support, and learning environment. Each dimension consisted of critical factors for the readiness measurement. For instance, the factors included in the student dimension are self-motivation and self-regulation, while the ones encompassed in the teacher dimension include self-efficacy as well as computer access and competence. To evaluate the Iraqi universities' e-learning readiness, Al-Rikabi and Montazer (2024) developed a model consisting of three main dimensions (i.e., infrastructure, human, and organization). The infrastructure dimension assesses the availability of the technological and security solutions needed for the success of e-

learning adoption. The human dimension encompasses multiple aspects, such as the evaluation of the readiness of human resources (e.g., whether the staff have the necessary knowledge for using e-learning systems). The organizational dimension evaluates multiple facets of the educational institution's readiness, such as the participation of the institution's management in the processes of adopting and developing e-learning systems.

Among the studies that focused on identifying the most used dimensions in prior models of the institution readiness for e-learning, Demir and Yurdugül (2015) highlighted that the factors with high frequency in these models include ICT infrastructure, finance, content, human resources, competency of technology usage, and management and leadership. More recently, Al-Rikabi and Montazer (2024) compared several latest e-learning readiness models and clarified that most of them share the following dimensions: technological readiness, human resources readiness, financial readiness, culture, and content. Some studies included dimensions that specifically signify the individuals' readiness for e-learning, which is one of the components of the overall organizational readiness. For instance, in their review of the factors assessing e-learning readiness in higher institutions, Rohayani (2015) concluded that the skills and attitudes of individuals involved in the learning process (e.g., faculty members) are the most significant determinants affecting such readiness.

According to the aforesaid review of the dimensions of the organizational readiness for IT innovations, including e-learning, the five readiness dimensions examined in the present study are among the frequently used ones to assess the readiness for innovation implementation.

2.2 Extrinsic motivation

Extrinsic motivation is one of the major types of motivation identified by the Self-Determination Theory (SDT). This theory is a well-known motivation theoretical framework that has been applied to understand the motivation of individuals in a variety of contexts, including education (Ryan & Deci, 2020). It has been indicated as a useful theory for predicting e-learning continuance intention (Roca & Gagné, 2008). It distinguishes between two core types of motivation, namely intrinsic and extrinsic motivation, on the basis of the diverse reasons or goals that lead to an action (Ryan and Deci, 2020; Ryan and Deci, 2000). According to SDT, extrinsic motivation is distinguished from intrinsic motivation in that the latter refers to doing an activity because it is inherently enjoyable or interesting, while the former is about the performance of an activity because it leads to separable outcomes (i.e., separate from the activity itself) (Ryan & Deci, 2000). In this sense, Davis et al. (1992) included that extrinsic motivation affects behavior because of the reinforcement value of the consequences, while intrinsic motivation reflects the conduct of an activity without clear reinforcement other than the process of performing the activity itself. Broadly, extrinsically motivated individuals engage in the activities not because they enjoy them, but because the activities are instrumental in attaining a goal, getting a reward, or avoiding an undesirable consequence (Levesque et al., 2010). Extrinsic motivation has been investigated in several studies in the area of the adoption and usage of new technologies (Fagan et al., 2008). Within this area, extrinsic motivation is illuminated as “*the performance of an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions*” (Davis et al., 1992). Much of the prior research focused on extrinsic motivation to identify what valued outcomes separable of the activity itself impact the performance of an activity (Fagan et al., 2008). This activity has been regarded in the present study as the continuance usage of e-learning, while the valuable outcomes that contribute to doing it have been viewed in terms of achieving several post-adoption benefits, such as improving academic work performance and increasing productivity in carrying out academic tasks.

2.3 Continuance usage intention

Intention toward continuance use is a core construct identified by the Technology Continuance Theory (TCT) to provide an explanation of the user behavior toward technology continued usage. TCT theorized technology continuance intention as the final dependent construct influenced by multiple factors, including perceived usefulness, satisfaction, and attitude (Liao et al., 2009). This intention is regarded as a post-adoption behavior influenced by the initial use experience (Bhattacharjee, 2001). It is defined as “*the user's willingness to continue using a new technology over an extended period of time, even after the initial adoption and use phase*” (Deng et al., 2023). The significance of this intention is evident from multiple facets, including that the IT continuance usage is of a greater importance than the initial use in achieving the long-term viability and ultimate success of the adopted IT. Moreover, this continuance is central to the survival of organizations providing e-services (Bhattacharjee, 2001). This gives an indication that such continuance is also pivotal for the survival of e-learning innovation providers and the success of the innovation implementation in the adopting organizations.

In spite of this importance, research on usage continuance in general has only increased in recent years as most of the previous studies over the past two decades concentrated more on assessing user adoption and initial use of IT than continuation intention (Nguyen and Dao, 2024). As such, addressing the factors contributing to increase this intention has been a major focus in recent research in diverse technology implementation contexts, including e-learning (e.g., Deng et al., 2023; Patil and Undale, 2023; Roca and Gagné, 2008). In line with this prior research, the readiness dimensions and extrinsic motivation were examined in the present study as influencing factors of such intention.

3. Research Model

The postulated research model (Fig. 1) was developed by integrating key constructs from prior theoretical frameworks of organizational readiness, self-determination theory, and technology continuance theory. The model incorporates five dimensions of organizational readiness for e-learning (i.e., teaching staff readiness, technical readiness, process readiness, financial readiness, and administrative support) and extrinsic motivation as direct antecedents of intention toward continuance use. Both organizational readiness and extrinsic motivation are often anticipated to lead to successful changes and desired outcomes in diverse settings, including the academic environment. As such, they were hypothesized here as contributing factors to realize a highly desirable consequence of the implementation of technological innovations, which is continuance usage intention, in the e-learning context.

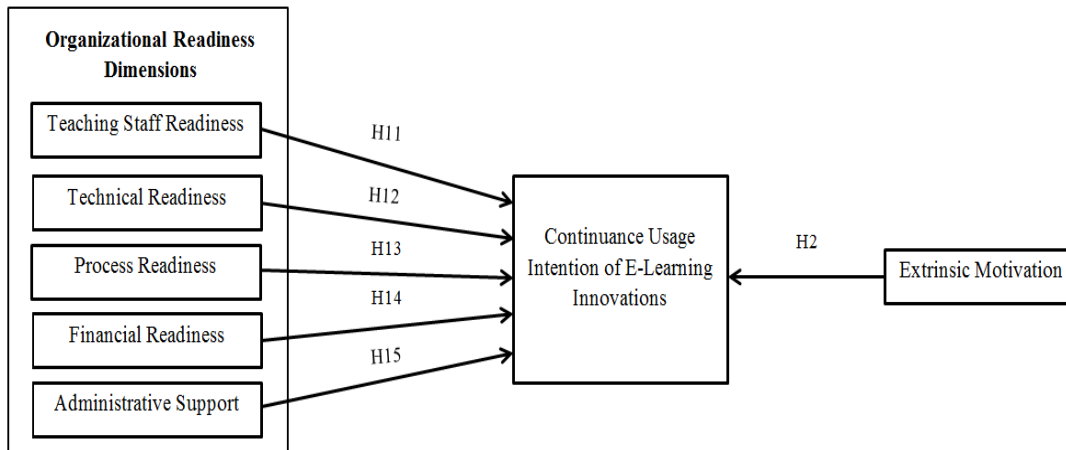


Fig. 1. The posited research model

In addition, the focus on this hypothesizing also stems from the encountered paucity of research concentrating on addressing such associations in the innovation adoption area. The justifications leading to each postulated effect in this hypothesizing are highlighted in the following subsections.

3.1 Effects of organizational readiness dimensions on continuance usage intention

3.1.1 Teaching staff readiness

Staff readiness reflects multiple human-related considerations that must be taken into account when implementing IT innovations, including technology skills and experience, the desire to use innovations, and the degree of involvement in IT projects (Snyder-Halpern, 2001). As such, it largely consists of staff technological competencies and their willingness to participate in the process of implementing IT innovation. Several studies highlighted it as an important enabler for the successful adoption of diverse technologies (e.g., Yazici (2014)). In the e-learning context, staff readiness has been included as a key dimension related to human resources in most of the models developed to assess e-learning readiness (Al-Rikabi & Montazer, 2024; Demir & Yurdugül, 2015). It is among the factors that are accountable for the success and failure of the e-learning adoption in institutions (Al-Rikabi & Montazer, 2024). A significant part of this readiness is shaped by the ability to efficiently use technology, which is required for adopting an e-learning system. As such, it is necessary for staff to have the knowledge and technical skills required for using e-learning systems (Al-Rikabi & Montazer, 2024). Additionally, this readiness requires having a motivated staff to implement e-Learning (Azimi, 2013). Concentrating on the effects of such readiness on the e-learning usage intention, El Alfy et al. (2017) pointed out that faculty members' technology readiness is a significant predictor of their behavioral intentions toward e-learning technologies. Nurkhin and Saputro (2021) found that the teacher's readiness had the strongest effect, among the factors studied, in increasing the intention to use online learning. In a similar vein, Brahmasrene and Lee (2012) suggested that the readiness for online learning (e.g., possessing the knowledge and competence necessary to use the online learning system) is directly associated with the continuance usage intention. Building upon these findings, the following hypothesis is investigated:

H11: *Teaching staff readiness has a positive effect on the continuance usage intention of e-learning innovations.*

3.1.2 Technical readiness

Technical readiness received almost similar interpretations in the technological innovation adoption area. Among these, Snyder-Halpern (2001) indicated it as the capability of the existing organization's hardware and software to support the implementation of IT innovations. Shahrasbi and Paré (2014) included it as the degree to which an organization possesses the

technological resources necessary for the successful adoption and implementation of such innovations. Similarly, it was explained in the e-learning context as having the required ICT infrastructure (e.g., official website, dedicated server, and computers for both students and lecturers) to support this kind of learning (Azimi, 2013; Nwagwu, 2020). Based on these interpretations, technical readiness is conceptualized here as the ability of the extant organization's technological infrastructure to support the implementation of e-learning innovations. This ability is demonstrated by having the technology resources that ensure the success of the implementation process, including stable networking components (e.g., servers), sufficient hardware and software, and highly skilled technical staff.

Such technical readiness was pointed out by Abdullah and Toycan (2017) as the strongest predictor, among the examined factors, of e-learning adoption. Also, Patil and Undale (2023) included that the availability of hardware and software resources (i.e., a major facet of the technical readiness) is critical to the success of e-learning adoption projects. Furthermore, they found that the availability of these resources is a significant positive determinant of the intention to continue using the e-Learning technology. In the same vein, such availability of resources was found by Almaiah et al. (2021) as a factor that positively influences the actual use of a crucial type of e-learning innovations, namely mobile learning platforms. Hence, it is reasonable to assume that technical readiness plays a significant role in increasing the academic staff's willingness to rely more on e-learning innovations in conducting teaching and assessment activities. As such, the following hypothesis is posited:

H₁₂: *Technical readiness has a positive effect on the continuance usage intention of e-learning innovations.*

3.1.3 Process readiness

Process readiness comprises the level of fit between the current processes in the adopting organization and the adopted technological innovation. This level of fit reflects the degree to which processes and innovation need to be altered in order to ensure that they are compatible with each other (Martin et al., 2008). Likewise, Shahrabi and Paré (2014) reflected process readiness as “*the level of compatibility and fit between the existing practices and processes and those required for the new technology*”. As such, it represents an indicator of the extent to which the extant processes are in line with the digital transformation introduced by implementing new technologies (Shahrabi, 2016). A low level of this readiness indicates the need to redesign processes before carrying out the innovation implementation activities (Shahrabi & Paré, 2014; Snyder-Halpern, 2001). This process redesign contributes to eliminating the gap between organizations' current processes and those required and compatible with new technologies (Shahrabi, 2016). Following these studies, the process readiness is conceptualized here as the degree to which the e-learning innovation is compatible with the existing academic processes and practices in the adopting institution. The main instances of these academic elements include teaching, learning, students' achievement evaluation, and classroom practices.

The effect of process readiness on the continuance intention to use technological innovations was largely overlooked in prior studies. However, some researchers found positive influences for process readiness on other relevant constructs, such as the utilization (Aldwry, 2012) and adoption (Van den Berg and Van der Lingen, 2019) of an innovation. Such influences can form a basis for assuming a significant contribution of process readiness toward increasing continuance usage intention of the adopted innovation. Therefore, this hypothesis is postulated:

H₁₃: *Process readiness has a positive effect on the continuance usage intention of e-learning innovations.*

3.1.4 Financial readiness

Financial readiness encompasses the degree to which an organization has the required financial capability to adopt and implement a new information system (Shahrabi, 2016). This capability is mainly reflected by the availability of the financial resources necessary to cover several basic costs, including those related to the installation of the adopted innovation as well as the implementation of subsequent improvements and ongoing expenses during its use (Nilashi et al., 2016). Respecting the e-learning context, financial readiness is one of the most important dimensions used in the models developed for assessing the institution's readiness for such learning (Al-Rikabi & Montazer, 2024; Demir & Yurdugül, 2015). This high importance of financial readiness stems from the extant of inevitable intrinsic costs, including the expenditures pertaining to adopting modern systems, producing courseware, training the personnel, and changing the business processes (Darab & Montazer, 2011). Focusing on the impacts of financial readiness, Nwagwu (2020) found that this dimension contributed more than others toward the adoption of e-learning by lecturers in the Nigerian environment. Gupta and Maurya (2022) pointed out the significant impact of a construct consisting of financial readiness, as a main component, on the continuance intentions of massive open online courses. Considering these findings of prior e-learning studies, the following hypothesis is postulated:

H₁₄: *Financial readiness has a positive effect on the continuance usage intention of e-learning innovations.*

3.1.5 Administrative support

Administrative support emphasizes a set of key actions forming the leadership involvement in the implementation process of IT innovations, such as the incorporation of IT initiatives into the organization's strategic plan, executive championing of IT implementation projects, and provision of supportive environments for successfully implementing IT innovations (Snyder-Halpern, 2001). In the e-learning context, administrative support is among the frequently cited constructs in institutional e-Learning models (Bacolod, 2023). It greatly comprises the leadership's commitment to shift from the traditional delivery of

instruction to e-Learning as well as the provision of the policies, procedures, and support necessary to augment this change (Mercado, 2008).

The impact of this administrative support on the continuance usage intention did not receive considerable attention in the e-learning context. However, generally speaking, such administrative support has a vital role in influencing instructors to use the technology (Moses et al., 2012) and ensuring the continuity of their development with such usage to guarantee that this progress does not stop (El Shaban & Egbert, 2018). This role was also highlighted by Kundu et al. (2020) by including that the encouragement and support provided by the leadership motivate instructors to rely on ICT in their teaching. In this vein, several studies provided empirical evidence for a significant positive relationship between administrative support and the instructors' use of technology (e.g., Khan et al., 2022). In light of these indications and findings of prior studies, the following relationship is hypothesized:

H₁₅: *Administrative support has a positive effect on the continuance usage intention of e-learning innovations.*

3.2 Effects of extrinsic motivation on continuance usage intention

In line with most previous studies (e.g., Fagan et al. (2008); Roca and Gagné (2008); Davis et al. (1992)), the present study has operationalized extrinsic motivation in terms of a common representative example of it, which is perceived usefulness. Originally, perceived usefulness is a construct in the Technology Acceptance Model (TAM) that refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). Later, Davis et al. (1992) defined perceived usefulness as an extrinsic motivation. As such, extrinsic motivation has been assessed in this study using measurement items of perceived usefulness from TAM. Accordingly, this construct is indicated here by users' perceptions of whether using e-learning innovations will lead to valued outcomes, including improving their academic performance, productivity, and task accomplishment. In the technology adoption area, perceived usefulness is viewed as one of the factors that constitute the baseline for addressing individuals' intentions to use technology (Saeed Al-Marouf et al., 2020). In this vein, previous research has shown that perceived usefulness and continuance usage intention are positively related in diverse technology adoption contexts, including e-learning (e.g., Saeed Al-Marouf et al. (2020) and m-banking (e.g., Nguyen and Dao (2024)). As such, there is a great possibility that users will have a continuance usage intention toward e-learning innovations when they perceive the usefulness of such technologies in improving their performance. Since perceived usefulness is a representative form of extrinsic motivation (Fagan et al., 2008; Davis et al., 1992), the following relationship is hypothesized:

H₂: *Extrinsic motivation (operationalized as perceived usefulness) has a positive effect on the continuance usage intention of e-learning innovations.*

4. Methodology

The quantitative research approach was implemented to empirically examine the hypothesized effects of organizational readiness dimensions and extrinsic motivation on the continuance usage intention. This approach is commonly used by researchers in diverse research contexts (Taherdoost, 2022), such as addressing the adoption of IT innovations. It comprises employing measurement statements to collect numerical data about the constructs included in the postulated research model and applying appropriate statistical methods to analyze the obtained data. Accordingly, a structured survey questionnaire (i.e., having predefined assessment statements and response options) was designed by including the most relevant measurement statements for the seven constructs examined in this study, which are the five readiness dimensions, extrinsic motivation, and intention toward continuance use. These statements (listed in Appendix A) were adapted from prior studies in the areas of organizational readiness and IT adoption. Some minor amendments were made to these statements in order to increase their appropriateness for the e-learning context. The total number of these statements is 23, and their sources are as follows.

Firstly, for measuring the five readiness dimensions, the three statements assessing teaching staff readiness (TSR) were derived from Snyder-Halpern (2001) and Cheon et al. (2012). These statements reflect the participants' judgment of their technical skills, experience, and desire to effectively use e-learning innovations. Technical readiness (TR) was measured by four statements assessing the availability, stability, capacity, and compatibility of the technical resources needed to implement e-learning innovations. These statements were adapted from the technological readiness self-assessment suggested by Karp and Fletcher (2014). Process readiness (PR) was assessed based on three statements adapted from Shahrasbi (2016). These statements indicate the extent to which the e-learning innovation is compatible with the existing learning and evaluation processes conducted in the adopting institution as well as the preferred educational practices. Financial Readiness (FR) was measured using two statements adapted from Shahrasbi (2016) and Van den Berg and Van der Lingen (2019) to assess the institution's capability to provide the required financial support and resources for running and maintaining the e-learning innovations. Administrative support (AS) was evaluated using four statements derived from Snyder-Halpern (2001) and Fadelelmoula (2018). These statements assess the commitment of the institution's leadership to providing the policies, procedures, support, and encouragement required to ensure the successful implementation of e-learning innovations. Second, assessing extrinsic motivation (EM) was conducted based on four statements measuring the perceptions of the benefits achieved from the usage of e-learning innovations, such as easing the accomplishment of academic tasks, increasing the productivity, and improving the overall performance of academic work. These statements were taken from Davis (1989).

Lastly, the three statements measuring continuance usage intention were adapted from Liao (2009). These statements evaluate the degree to which the participants intend to use e-learning innovations regularly and specifically in the future.

In addition to the statements measuring the developed model's constructs, the questionnaire also encompassed ones pertaining to six characteristics of the potential participants, namely gender, age, education level, academic rank, teaching experience, and e-learning usage experience. The content validity of the entire questionnaire (i.e., the clarity and adequacy of all statements) was checked according to the feedback of five expert researchers in the IT and business domains. Based on their comments, the necessary rephrasing and changes were performed to ensure the clarity and relevance of six statements. The responses to all statements, excluding participant characteristics, were evaluated using a 5-point Likert scale (i.e., ranging between 1=strongly disagree and 5=strongly agree).

For data collection, the study population was the teaching staff of the considered Saudi university (i.e., PSAU). The focus on teaching staff mainly stemmed from their active participation in delivering online courses and advising sessions during the pandemic period, their highly anticipated role in driving the successful implementation of e-learning initiatives and academic changes, as well as the need to understand the factors affecting their intentions toward the continuance use of e-learning innovations in the post-pandemic era. In this population, the participants were selected using an extensively implemented non-probability sampling technique in the IT adoption research, namely convenience sampling. This technique involves recruiting easily accessible individuals who are willing to be part of the study sample as participants (Scholtz, 2021). Using this technique, the questionnaire was administered electronically and in paper form to a sample consisting of 312 participants. At the end of the 6 weeks period allocated for data collection, 251 responses were received, indicating an appropriate response ratio of 80.4%. Out of these responses, 233 were fully completed with a selection of varied options, thereby they were considered valid for analysis and hypotheses testing. The demographic statistics of the participants who provided these valid responses are outlined in Table 1. Most of these participants were male (90.1%), aged from 35 to 44 years old (38.2%), PhD holders (69.5%), assistant professors (45.9%), had a teaching experience of more than 5 years (82%), and had experience of greater than 2 years in the e-learning usage (63.9%).

5. Analysis and Findings

The structural equation modeling (SEM) approach was employed for analyzing the data obtained from the 233 valid responses. SEM is a crucial quantitative data analysis approach that is gaining widespread popularity among researchers inside and outside educational settings. A major strength of SEM, as compared to the traditional analysis methods, is that it represents a multivariate analysis method consisting of a set of statistical techniques that can be applied to examine models having several dependent and independent constructs as well as several chains of impacts in one run (Yin a& Huang, 2021). Essentially, SEM involves assessing two models: the measurement and structural models (Hair et al., 2019). In the present study, the measurement model encompassed the relationships between the examined constructs (i.e., organizational readiness dimensions, extrinsic motivation, and continuance usage intention) and their corresponding measurement statements in the developed questionnaire, while the structural model represented the hypothesized effects of organizational readiness dimensions and extrinsic motivation on the continuance usage intention. To implement the SEM approach, two popular statistical software tools were used: IBM SPSS and Amos.

5.1 Measurement model assessment

The postulated measurement model of this study represented the relationships between the seven studied variables (i.e., the five dimensions of organizational readiness, extrinsic motivation, and continuance usage intention) and their observed indicators (i.e., their corresponding measurement statements in the developed questionnaire). Assessing this model comprised checking its goodness-of-fit, construct validity, and reliability. As such, the assessment of this model started off by carrying out a confirmatory factor analysis, using Amos software, to test its overall goodness-of-fit to the data gathered through the conducted survey. A set of widely reported goodness-of-fit indices were considered for such assessment, including the Normed Chi-square (χ^2/df), Root Mean Square Error of Approximation (RMSEA), Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Tucker-Lewis Index (TLI) (Schermelleh-Engel et al. (2003); Smith and McMillan, 2001). The results (Table 4) demonstrated that all of these indices have acceptable values ($\chi^2/df = 1.388$, GFI = 0.915, CFI = 0.977, NFI = 0.924, TLI = 0.969, RMSEA = 0.041) compared to their recommended levels, indicating that the measurement model exhibited a satisfactory fit with the collected data. After verifying the overall model fit, assessing the measurement model involved the evaluation of the degree to which each construct in this model relates strongly to the questionnaire items used to measure it. To conduct this evaluation, both the construct validity and reliability were tested. The construct validity was tested in terms of two subtypes of it, which are convergent validity and discriminant validity. Convergent validity (i.e., the degree to which the items measuring a construct relate to each other) was tested by assessing two common measures, namely factor loadings and average variance extracted (AVE). Factor loadings indicate the associations between the examined constructs and their corresponding measurement items. Obtaining these loadings involved performing a factor analysis. The results of this analysis (Table 2) showed that the loading of each measurement item on its corresponding construct was above the ideal value of 0.7 (Hair et al., 2019). Therefore, the questionnaire statements measuring each construct were satisfactorily linked to it. According to these factor loadings, the second measure of convergent validity (i.e., AVE) was computed for each construct by considering the mean of the squared item loadings for its items. The computed

AVE values (Table 2), ranging from 0.62 to 0.88, were above the threshold value of 0.5 (Hair et al., 2019), thereby signifying a satisfactory convergence. Building upon the values of these two measures (i.e., factor loadings and AVE), the measurement model had acceptable convergent validity. Discriminant validity (i.e., the degree to which the examined constructs differ from each other) was tested using the Fornell-Lacker criterion (Fornell & Lacker, 1981), which implies that the square root of the AVE of each construct should be larger than the value of the construct's correlation with any other construct. Table 3 shows that the AVE's square roots for all constructs (i.e., the diagonal values) were greater than the correlations among these constructs (i.e., the off-diagonal values); thus, these constructs satisfied the criterion. Accordingly, the discriminant validity was confirmed for the model's constructs.

Table 1Demographic statistics of the sample ($n=233$)

Attribute	Value	Frequency	Percentage
Gender	Male	210	90.1%
	Female	23	9.9%
Age	Under 25 years	2	0.9%
	25–34	39	16.7%
	35–44	89	38.2%
	45–54	80	34.3%
	55 years and above	23	9.9%
Education Level	Bachelor	4	1.7%
	Master	66	28.3%
	PhD	162	69.5%
	Other	1	0.4%
Academic Rank	Teaching assistant	6	2.6%
	Lecturer	69	29.6%
	Assistant professor	107	45.9%
	Associate professor	41	17.6%
	Professor	10	4.3%
Teaching Experience (in years)	Under 1 year	7	3.0%
	1–5 years	35	15.0%
	6–10 years	63	27.0%
	11–15 years	71	30.5%
	More than 15 years	57	24.5%
E-learning Usage Experience (in years)	Under 1 year	5	2.1%
	1–2 years	79	33.9%
	3–5 years	101	43.3%
	More than 5 years	48	20.6%

The construct reliability (i.e., the degree to which each construct is consistently assessed by its corresponding measurement statements) (Hair et al., 2019) was tested using two widely implemented metrics: Cronbach's alpha (α) (Cronbach, 1951) and composite reliability (Fornell and Larcker, 1981).

Table 2

Item loadings, reliability measures, and AVEs for all constructs

Construct	Items	loadings	Cronbach's Alpha	Composite Reliability	AVE
Teaching Staff Readiness (TSR)	TSR1	0.826	0.829	0.898	0.75
	TSR2	0.896			
	TSR3	0.867			
Technical Readiness (TR)	TR1	0.752	0.790	0.866	0.62
	TR2	0.854			
	TR3	0.734			
	TR4	0.799			
Process Readiness (PR)	PR1	0.844	0.783	0.875	0.70
	PR2	0.891			
	PR3	0.771			
Financial Readiness (FR)	FR1	0.936	0.859	0.934	0.88
	FR2	0.936			
Administrative Support (AS)	AS1	0.795	0.848	0.899	0.69
	AS2	0.894			
	AS3	0.835			
	AS4	0.793			
Extrinsic Motivation (EM)	EM1	0.892	0.908	0.936	0.78
	EM2	0.878			
	EM3	0.906			
	EM4	0.868			
Continuance Usage Intention (CUI)	ITCU1	0.873	0.866	0.919	0.79
	ITCU2	0.891			
	ITCU3	0.904			

The obtained values of these two metrics (Table 2), ranging from 0.783 to 0.908 for Cronbach's alpha and between 0.866 and 0.936 for composite reliability, were in the acceptable range of 0.70 - 0.95. Accordingly, adequate construct reliability was

demonstrated. As the data for all constructs included in our measurement model were collected from the same respondents through a single survey, it was necessary to check the presence of the Common Method Bias (CMB). This bias leads to measurement errors that can significantly influence the findings of research studies (Eichhorn, 2014; Podsakoff et al., 2003). To detect the existence of this bias, a common detective statistical method was conducted, which is Harman's Single Factor Test (Podsakoff et al., 2003). This test, as outlined by Podsakoff et al. (2003), required entering all the indicators of the examined model's constructs into an exploratory factor analysis (i.e., carried out using SPSS) to determine whether one factor is responsible for the majority of the total variance or a single factor emerges (i.e., CMB presence conditions). The results indicated that seven factors were responsible for 76.20% of the total variance, whereas the single factor accounted for only 32.39% of this variance. As such, the single factor explained less than the 50% (i.e., the cut-off value) of the total variance, suggesting that common method bias was not a threat to the findings of this study.

Table 3
Discriminant validity testing

	TSR	TR	PR	FR	AS	EM	CUI
Teaching Staff Readiness (TSR)	0.866						
Technical Readiness (TR)	0.276	0.787					
Process Readiness (PR)	0.358	0.685	0.837				
Financial Readiness (FR)	0.175	0.545	0.560	0.938			
Administrative Support (AS)	0.372	0.573	0.613	0.511	0.831		
Extrinsic Motivation (EM)	0.469	0.268	0.232	0.159	0.348	0.883	
Continuance Usage Intention (CUI)	0.355	0.244	0.195	0.160	0.366	0.552	0.889

Notes: The squared roots of the obtained AVE values are displayed in bold on the diagonal, while the correlations between the model's constructs are shown in regular style as off-diagonal values.

* All correlations are significant at the level of $p < 0.001$

The obtained result of Harman's single-factor test was verified by comparing the fit indices of the measurement model (i.e., containing 7 factors) with those of a single-factor model that links all the indicators of the study's constructs to only one factor. This comparison involved conducting a confirmatory factor analysis to produce the fit indices of the latter model. The results demonstrated that the fit indices of the examined measurement model ($\chi^2/df = 1.388$, GFI = 0.915, CFI = 0.977, NFI = 0.924, TLI = 0.969, RMSEA = 0.041) were significantly better than those of the single-factor model ($\chi^2/df = 6.415$, GFI = 0.595, CFI = 0.609, NFI = 0.571, TLI = 0.564, RMSEA = 0.153). This indicates the poor fit of the single-factor model and thus confirms that the common method bias was not an issue impacting the validity of the present study findings.

5.2 Structural model assessment

The assessment of the structural model consisted of two tests: evaluating the model's fit to the sample data and testing the hypothesized relationships between the model's constructs. The first test was conducted by evaluating the fit indices of the structural model on the basis of their recommended threshold values. The findings of this test (Table 4) revealed that the obtained values of these indices ($\chi^2/df = 1.451$, GFI = 0.913, CFI = 0.974, NFI = 0.921, TLI = 0.964, RMSEA = 0.044) met the conditions of their recommended values, indicating a satisfactory model fit to the collected data. Therefore, the validity of the structural model for the second test was confirmed. The second test encompassed assessing the hypothesized relationships between the independent constructs (i.e., organizational readiness dimensions and extrinsic motivation) and the dependent construct (continuance usage intention).

The assessment of these hypothesized relationships was conducted on the basis of the standardized path coefficients (i.e., β values) for all paths from the five dimensions of organizational readiness and extrinsic motivation to the continuance usage intention. The assessment of the obtained values of these coefficients as well as the significance of their corresponding t-values (shown in Table 5 and Figure 2) indicated the significance of only three paths in the structural model. These paths correspond to the hypotheses H11 (TSR \rightarrow CUI), H15 (AS \rightarrow CUI), and H2 (EM \rightarrow CUI). Accordingly, each of teaching staff readiness ($\beta = 0.249$, $t = 2.865$, $p < 0.01$), administrative support ($\beta = 0.212$, $t = 2.327$, $p < 0.05$), and extrinsic motivation ($\beta = 0.340$, $t = 4.225$, $p < 0.001$) had a significant positive effect on the continuance usage intention of e-learning innovations. Conversely, the paths representing the hypotheses H12 (TR \rightarrow CUI), H13 (PR \rightarrow CUI), and H14 (FR \rightarrow CUI) were not supported, indicating that each of technical readiness ($\beta = 0.034$, $t = 0.288$, $p > 0.05$), process readiness ($\beta = -0.132$, $t = -1.353$, $p > 0.05$), and financial readiness ($\beta = 0.057$, $t = 0.679$, $p > 0.05$) had no significant influence on such continuance intention.

Table 4
Goodness-of-fit indices for both the measurement and structural models

Indices	Measurement model	Structural model	Cut-off value	References
χ^2/df	1.388	1.451	< 3.00	Schermelleh-Engel et al. (2003)
GFI	0.915	0.913	> 0.90	Smith and McMillan (2001)
CFI	0.977	0.974		
NFI	0.924	0.921		
TLI	0.969	0.964		
RMSEA	0.041	0.044	< 0.08	Schermelleh-Engel et al. (2003)

Table 5
Results of the structural model evaluation

Hypothesized path	Standardized path coefficient (β)	t-Value	Result
H11: TSR \rightarrow CUI	0.249	2.865**	Supported
H12: TR \rightarrow CUI	0.034	0.288	Not Supported
H13: PR \rightarrow CUI	-0.132	-1.353	Not Supported
H14: FR \rightarrow CUI	0.057	0.679	Not Supported
H15: AS \rightarrow CUI	0.212	2.327***	Supported
H2: EM \rightarrow CUI	0.340	4.225*	Supported

* Significant for $p < 0.001$; ** Significant for $p < 0.01$; *** Significant for $p < 0.05$

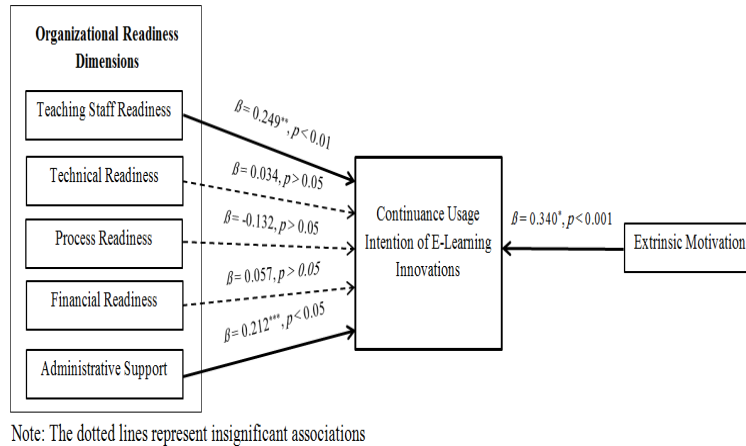


Fig. 2. The posited research model examination results

6. Discussion and implications

The main concentration of this study was to examine the effects of key organizational readiness dimensions (i.e., teaching staff readiness, technical readiness, process readiness, financial readiness, and administrative support) and extrinsic motivation on the teaching staff's intention toward the continued voluntary use of e-learning innovations in the post-pandemic era. This concentration was mainly due to the great potential of organizational readiness dimensions and extrinsic motivation to frequently promote the continued voluntary use of such innovations as well as to ensure their successful implementation. The empirical assessment of their effects using the structural equation modeling approach demonstrated that two organizational readiness dimensions (i.e., teaching staff readiness and administrative support) as well as extrinsic motivation have direct positive associations with the continuance usage intention of e-learning innovations. Consequently, this intention is significantly promoted when the teaching staff have the skills and experience to use these innovations effectively and when they perceive such usage as beneficial in achieving valuable outcomes, including improving their academic work effectiveness. In addition, this intention is also driven by the support and encouragement of senior leaders to use these innovations.

These explored positive effects are consistent with those found in previous studies for teaching staff readiness (e.g., Nurkhin & Saputro, 2021) and extrinsic motivation (e.g., Fagan et al., 2008; Tran & Kim, 2023). Regarding the significant effect obtained for administrative support, it is in line with the positive associations revealed in prior research on the influence of this construct on instructors' use of technology (e.g., Khan et al., 2022). This alignment with those studies asserts that teaching staff preparation for e-learning and their perception of the valuable outcomes of transitioning to this learning, as well as top management involvement in implementing the innovative technologies of such learning play prominent roles in realizing the continuance usage intention and overall successful adoption of these innovations, given that this intention is a pivotal factor for the success of e-learning programs (Brahmasrene & Lee, 2012).

According to these findings, the technical skills and capabilities of teaching staff to use these innovations should receive great attention from the policy makers in the e-learning adopting institutions by setting effective strategies for staff development training programs. Policy makers are also required to set effective policies and procedures to augment the roles of top management in supporting and ensuring the successful implementation of the adopted innovations, as well as in achieving the valued outcomes of implementing these innovations. Promoting the achievement of the valuable outcomes of these innovations is also a key responsibility of e-learning innovation developers. This responsibility involves developing innovative e-learning solutions that greatly strengthen users' extrinsic motivation by leading to substantial beneficial usage consequences, such as increasing users' productivity in carrying out their academic tasks, making it more easier for them to do such tasks, and enhancing their overall academic performance.

Based on the produced standardized path coefficients (Table 5), extrinsic motivation ($\beta = 0.340$) had the largest impact on motivating the teaching staff to continue using e-learning innovations, followed by the two dimensions of organizational readiness, namely teaching staff readiness ($\beta = 0.249$) and administrative support ($\beta = 0.212$). This confirms the merit of

extrinsic motivation, as compared to the organizational readiness dimensions, in substantially increasing the continuance usage intention in the context of e-learning innovations. This agrees with the results of Tran and Kim (2023), who found extrinsic motivation as the strongest predictor, among the examined motivations, of the continued usage intention of virtual interactive platforms. In addition, it is consistent with the substantial potential for extrinsic motivation to have a powerful impact on human behavior (Cherry, 2024). As such, augmenting the aspects of extrinsic motivation that encourage users to continue using such innovations should receive considerable focus from the key e-learning stakeholders (e.g., adopting organizations and innovative technology developers). Instances of these aspects include offering regular rewards to those who rely heavily on e-learning innovations in their academic work, maintaining ongoing awareness of the desired short- and long-term consequences of these innovations, and developing e-learning solutions that are compatible with preferred teaching strategies and assessment methods in various disciplines.

Although technical, process, and financial readiness are highly expected to contribute significantly to motivating teaching staff intention to continue using e-learning innovations, the findings show that these dimensions of organizational readiness cannot serve as direct influential determinants of this intention in the considered e-learning implementation context. A major possible reason for this finding is that these three dimensions can largely act as facilitators driving the successful adoption of e-learning solutions rather than having a substantial post-adoption role in realizing continued usage intention. This possibility is partially in line with the results of several studies pointing out that such successful adoption of technology is significantly predicted by technical readiness (e.g., Abdullah and Toycan (2017)), process readiness (e.g., Van den Berg and Van der Lingen (2019)), and financial readiness (e.g., Nwagwu (2020)). Conversely, this possibility is inconsistent with the findings of studies demonstrating positive effects of constructs encompassing technical readiness (e.g., Patil and Undale (2023)) and financial readiness (e.g., Gupta and Maurya (2022)) on the continuance usage intention. This discrepancy can be attributed to multiple factors, including the concentration of these studies on the students' perspective, which may differ greatly from the teaching staff assessment of these readiness dimensions, as well as the consideration of many of these studies for constructs reflecting the individual readiness rather than the organizational readiness.

However, the insignificant results obtained for these three organizational readiness dimensions suggest that senior leaders and policy developers in the adopting intuitions should consider maximizing the availability of technical and financial resources needed to increase the continued use of e-learning innovations. These resources include dedicated computers, software, and technical support for the main parties involved in the e-learning implementation (e.g., teaching staff) as well as ongoing financial support for acquiring such resources and guaranteeing the stability of internet connections and servers running e-learning innovations. Additionally, these key stakeholders are required to focus more on ensuring the aspects of process readiness leading to such continuance usage, including the compatibility of extant learning and evaluation processes as well as implemented academic practices with the adopted innovative technologies. Such compatibility is widely recognized in other contexts (i.e., than e-learning) among the factors having strong positive influences on the continued usage intention of innovations (Yen et al., 2019). As such, the strategies and policies developed to augment process readiness should increase the level of such compatibility by including effective process redesign and practices change leading to greater alignment with the changes introduced by e-learning innovations. Also, the developers of e-learning innovations have a crucial role in increasing such compatibility by designing effective technological solutions that are highly compatible with the preferred educational procedures and practices in most academic institutions.

7. Conclusion

The target of this study was to explore the extent to which the organizational readiness dimensions and extrinsic motivation contribute to motivating the teaching staff intention toward the continued voluntary use of e-learning innovations in the post-pandemic era. Accordingly, an integrated research model incorporating the effects of five key organizational readiness dimensions and extrinsic motivation on this intention was developed and afterwards assessed using the structural equation modeling. The findings indicated that this intention is positively affected only by teaching staff readiness, administrative support, and extrinsic motivation. Comparing the effects of these factors indicated extrinsic motivation as the strongest determinant of this intention, followed by the two organizational readiness dimensions (i.e., teaching staff readiness and administrative support). This gives an indication that the beneficial outcomes resulting from using e-learning innovations are more important in driving the continuance usage intention than the dimensions of the readiness to implement these innovations.

From a practical perspective, the findings assert the need for e-learning adopting academic institutions to focus on augmenting these positive effects of teaching staff readiness and administrative support by ensuring great degrees of the facets constituting these two readiness dimensions, including durable provision of staff development training and awareness programs on educational technological innovations, high involvement of senior leaders in implementing these innovations, and proper inclusion of actions supporting the use of these innovations in the strategic plans of the institution. Respecting the strongest positive impact of extrinsic motivation, the findings emphasize that providers of these innovations are needed to offer e-learning solutions that strengthen the crucial aspects of this motivation leading to the continued usage intention, such as enabling users to attain their educational goals and increase their productivity and effectiveness in carrying out academic tasks.

The uniqueness of this study is evidenced by the lack of sufficient research on the effects of organizational readiness dimensions and extrinsic motivation on the continued voluntary use of e-learning innovations. Although these factors were

found in prior studies as significant determinants of the adoption of technological innovations, their effects on the continuance usage intention were not given considerable attention in the e-learning area. Accordingly, the present study contributes to the body of knowledge on such area by producing new insights and clarifications on the factors influencing the continued use intention of the adopted innovation. Such findings are significant to both e-learning researchers and practitioners to have a more meaningful understanding of the drivers of the continuance usage intention, which is generally viewed as a crucial indicator of the innovation implementation success.

Among the limitations of this study, only the effects of a subset of key organizational readiness dimensions and one type of motivation on the continuance usage intention were included in the conducted empirical examination. This emphasizes the need for subsequent assessments evaluating the degree to which such intention is influenced by other factors from both organizational readiness and motivational theories. Another limitation is that the data included in the analysis were collected from a single context of e-learning innovation implementation, which obviously hinders the generalizability of the obtained results. As such, it is necessary to verify the findings in future studies that consider a variety of settings characterized by the successful implementation of e-learning innovations.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Appendix A. Questionnaire Statements

Teaching Staff Readiness (TSR)
TSR1: The teaching staff in our institution possess the required technical skills and experience to effectively use e-learning innovations TSR2: The teaching staff in our institution have the desire to use e-learning innovations TSR3: The teaching staff in our institution are enthusiastic to be involved in projects pertaining to e-learning innovations
Technical Readiness (TR)
TR1: Our institution's servers and networks are stable and have the capacity to support the needs of the e-learning innovation (e.g., supporting increased data load and heavy usage) TR2: Our institution has the necessary hardware and software for effectively implementing the e-learning innovation TR3: Our institution has a highly skilled technical staff that can handle the increased demand resulting from the implementation of the e-learning innovation TR4: The current IT systems in our institution are compatible with the e-learning innovation
Process Readiness (PR)
PR1: The e-learning innovation is compatible with the existing learning and evaluation processes conducted in our institution PR2: The e-learning innovation is compatible with the preferred educational practices PR3: Our institution has the ability and willingness to change the educational procedures for fitting any new changes introduced by the e-learning innovation
Financial Readiness (FR)
FR1: Our institution has the capability to provide the required financial support to adopt e-learning innovations FR2: Our institution has the capability to acquire sufficient resources (e.g., up-to-date technologies) for running and maintaining e-learning innovations
Administrative Support (AS)
AS1: Top leaders support and encourage the use of e-learning innovations AS2: Top leaders set the required policies and procedures for ensuring the successful implementation of e-learning innovations AS3: A senior manager in our institution is responsible for managing the implementation of e-learning innovations AS4: Adopting e-learning innovations is included in the strategic plan of our institution
Extrinsic Motivation (EM)
EM1: Using the e-learning innovation would improve my academic work performance EM2: Using the e-learning innovation would increase my productivity in carrying out my academic tasks EM3: Using the e-learning innovation would make it easier to do my academic tasks EM4: Overall, I would find the e-learning innovation useful in accomplishing my academic work
Continuance Usage Intention (CUI)
CUI1: I intend to continue using e-learning innovations in the future CUI2: I will frequently use e-learning innovations in the future CUI3: My intentions are to continue using e-learning innovations than use any alternative means (e.g., classroom Learning) whenever possible



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