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Bridging the Gap: Mindfulness as a Catalyst for Successful E-Learning Adoption: A Literature Review

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Abstract

As technology advances, individuals have more significant opportunities to apply innovative technologies at work and in their daily lives, and education is no exception. As technology becomes an essential part of education, higher education institutions face challenges in integrating technology into the instructional and educational experience. As e-learning facilitates greater convenience, flexibility, and self-paced learning, existing models for predicting individual adoption of online education may be inadequate. Considering the continually evolving and pervasive developments in technology-based learning, the present study aims to analyze and expand the existing technology adoption theories. This article proposes a conceptual framework to highlight the role of mindfulness in making informed decisions about technology-based learning, as well as to integrate the notion into existing adoption theory. The expanded TAM is expected to outperform the original TAM in explaining actual behavior in online learning.

Keywords: Intention to Use; Mindfulness; Technology Adoption; TAM

Introduction

Recently, the growth of digital technology has drastically changed the landscape of education, making e-learning an integral part of education that offers benefits such as convenience, flexibility, affordability, and easy accessibility (Tarrayo, Paz, & Gepila, 2023). O'Neill (2024) defines e-learning as technology-enabled learning that allows a learner to achieve specific learning goals without the need for face-to-face interactions between learner and instructor. Researchers have thoroughly researched the benefits of e-learning, which utilizes network technologies to develop, nurture, distribute, and support learning from any location and at any time (Nguyen, 2015; Sudarsana et al., 2019). Although e-learning has numerous benefits, transitioning to it is not without challenges. Students often get distracted while using technology for learning; at times, they lack motivation or feel isolated, thereby impeding the learning experience and outcomes. Amidst these challenges, mindfulness has emerged as a practice that can potentially transform the adoption of e-learning and enhance its outcome (Palalas *et al*., 2020; Chou, Hsieh, & Pan, 2024).

Mindfulness is defined as an individual's consciousness and concentration on the present moment without being judgmental, and it has been well researched in the context of physical and mental well-being (Jones, 2023). The existing literature presents evidence that mindfulness helps in reducing stress and enhancing concentration and overall cognitive functioning (Ch *et al*., 2023; Charness, Le Bihan, & Villeval, 2024). These benefits are highly desirable in the education domain, where students are under constant pressure to perform better and need to stay focused on the results. By adopting mindfulness in their studies, students will be in a better position to manage the unique challenges of e-learning, thereby leading to improved academic performance and overall growth.

Considering the above, the current study intends to explore the role of mindfulness in the adoption of e-learning. It aims to understand how mindfulness can affect learners' attitudes toward online education, and engagement with digital learning environments. This framework, which integrates concepts from educational psychology, cognitive science, and mindfulness research, will provide a

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complete understanding of the mechanisms by which mindfulness can support and enhance online learning. Finally, this research will help to shape techniques and interventions that use mindfulness to maximize the benefits of online learning for a wide range of student demographics.

Methodology

For the current study, existing literature on the five constructs—perceived usefulness, perceived ease of use, attitude, intention to use, and mindfulness has been used. Management journal databases such as Sage, Elsevier, Emerald, and Taylor & Francis have been primarily searched to source the secondary data for the present study. A comprehensive enumeration of literature related to technology adoption and mindfulness helped to conceptualize the process of acceptance of technology in the field of education.

Construct Conceptualization

The Theory of Reasoned Action

Understanding the precursors of the Technology Acceptance Model (TAM) is necessary to develop an extended model with strong underlying principles, known as the Theory of Reasoned Action (TRA). This model used ‘attitude towards a behavior’ and'subjective norm’ as key determinants of behavior (Fishbein & Ajzen, 1977). This theory defines attitude as “an individual’s evaluative effect about executing the desired behavior." The subjective norm has been defined in this theory as "the perceived notion that the majority of people who really make a difference to the individual believe that he should or should not exhibit a certain behavior." According to TRA, a belief about a behavior is the precursor to an individual's attitude toward that behavior (Kumar *et al*., 2023). TRA posits that if a person holds a positive attitude towards a behavior and perceives supportive subjective norms, they are expected to form a strong intention to engage in that behavior, ultimately leading to the actual performance of the behavior. This framework is significantly valuable to understand and predict when it comes to individuals making decisions to engage in specific actions. Due to this, it is substantially applicable in fields such as marketing, health promotion, and technology adoption.

The Technology Acceptance Model

Davis (1989) proposed TAM as a TRA modification. According to Davis (1989), perceived usefulness influences intention to use via perceived ease of use. As per the findings of the study, perceived usefulness affects behavioral intention directly, whereas perceived ease of use affects behavioral intention indirectly through attitude. The user's opinion of an information system application's usefulness is referred to as the attitude. In addition, behavioral intention has been used to estimate whether a person will use technology or not. TAM has been extensively validated and applied across various technological contexts, including information systems, online learning platforms, and mobile applications, making it a cornerstone model for understanding user acceptance. By elucidating the cognitive determinants of technology adoption, TAM provides valuable insights for developers and educators aiming to design user-friendly and effective technological solutions that align with user needs and expectations.

Mindfulness

Langer (1989) defined mindfulness as a state of attentiveness and vibrant consciousness. It has been demonstrated in a variety of fields that mindfulness is required for making informed choices and garnering long-term rewards (Shapiro *et al*., 2006). Mindfulness is commonly thought of as a psychological state. Generally, people become mindful at some stage in their lives, but there are some individuals who tend to be more mindful than others (Brown & Ryan, 2003). Mindfulness is essential in circumstances where there is a lot of uncertainty (Sun, 2011; Shufutinsky *et al*., 2023). Due to users' frequent confusion about what a technology is, its functionality, and how it fits into specific

local use contexts, among other issues, mindfulness plays a crucial role in facilitating user technology adoption and retention (Sun & Fang, 2010; Sun, Fang, & Zou, 2016). In general, information technologies are complex, with several attributes that the users are unaware of at the time of adoption. The complex nature of technology adds to the uncertainty surrounding its adoption. In such uncertain situations, mindfulness is essential for making sound decisions (Sun, 2011; Ioannou, Lycett, & Marshan, 2024).

Conceptual Framework

This study suggests the conceptual framework shown in the fig. based on a review of the body of existing literature. According to this framework, the perceived usability of technology has a significant effect on how useful it is perceived to be. This perception also helps people develop a positive attitude toward technology, which eventually results in positive behavioural intentions. This paper also aims to study the moderating effect of mindfulness on the relation between attitude towards technology and its usage intention.

Theoretical Foundation for The Framework

Preposition Development

P1: Perceived ease of use positively affects the perceived usefulness in the adoption of online learning.

According to Davis (1989), perceived ease of use (PEOU) is "the level to which an individual anticipates that using a specific system will be effortless". Additionally, perceived usefulness (PU) was defined as "the level to which an individual considers that using a specific system will improve his or her ability to perform a job". The relationship between PEOU and PU was first proposed and validated by Davis (1989), and since then it has been by several researchers (Venkatesh, 2000; Chen, & Aklikokou, 2020; Chiu & Cho, 2020; Siagian *et al*., 2022). In the field of e-learning also this relationship is proven well (Mohammadi, 2015; Fülöp *et al*., 2023).

P2: Perceived usefulness positively affects the attitude in adoption of online learning.

Mou, Shin, & Cohen (2017) states that PU is critical at both the initial and successive stages of the technology adoption. Technology related PU should be clearly communicated to the people dealing with it so that it leads to development of positive attitude (Davis, 1993; Upadhyay *et al*., 2018). Further, researchers suggest that when people use technology, especially the one which they believe will improve their productivity, their attitude becomes positive (Robinson, Marshall, & Stamps, 2005 Mansour, Eljelly, & Abdullah, 2016; Manda & Salim, 2021). Researchers who have carried out studies in education domain have also reported the similar relationship (Elkaseh, Wong, & Fung 2016; Rafiq, Hussain, & Abbas, 2020; Fülöp *et al*., 2023).

P3: Perceived ease of use positively affects the attitude in adoption of online learning.

Triandis (1971) explains attitude as a unique trait that depicts either favourable or unfavourable behavioural patterns and reproduces knowledge and thoughts about a specific topic or concept. Existing literature depicts attitude as an important indicator (Tosuntaş, Karadağ, & Orhan, 2015). Additionally, prior literature suggests that the PEOU has a significant impact on attitude (Davis, 1989; Mansour, Eljelly, & Abdullah 2016; Gunawan, Ali, & Nugroho, 2019; Manda & Salim, 2021; Prastiawan, Aisjah, & Rofiaty 2021). This relation has been validated in various information systems related studies (Venkatesh, 1999; Venkatesh, 2000) as well as internet-based banking research (Kaur & Malik, 2019; Ahmad, Bhatti, & Hwang 2020). Furthermore, e-learning studies have also suggested

empirical evidence for significant positive relation between the PEOU and attitude (Mansour *et al*., 2016; Fülöp *et al*., 2023).

P4: Attitude positively affects the intention to use online learning.

The association between attitude and intention to use and that the former impacts the later has been thoroughly researched and established in past years in the domain of technology adoption (Davis, Bagozzi, & Warshaw, 1989; Venkatesh, 2000; Sondakh, 2017; Vafaei-Zadeh *et al*., 2021). Further, this relationship has been investigated in the field of e- learning as well and a significant positive relationship has also been reported (Hussein, 2017; Chien, Wu, & Wu, 2018; Fülöp *et al*., 2023).

P5: Mindfulness moderates the relation between attitude and intention to use online learning.

Existing studies defines mindfulness as a psychological state of awareness where an individual is conscious of the problems related to his or her behavioural decisions (Langer, 1989; Sun & Fang, 2010; Hasson, 2024). Some researchers have investigated the moderating effect of mindfulness on technology adoption in recent years (Sampath *et al*., 2019; Zha *et al*., 2015; Gao *et al*., 2021). Konstantoulaki *et al*. (2022) states that individuals exhibit varying levels of mindfulness. According to Bernier *et al*. (2010), individuals with high levels of mindfulness focus more on the present and are likely to be high on self-awareness and confidence and individuals who are low on mindfulness are reluctant to the new experiences (Konstantoulaki *et al*., 2022). When it comes to adopting technology in learning, students with high mindfulness feel confident and are open for e-learning in comparison to the students who are low on mindfulness (Konstantoulaki *et al*., 2022; Zha *et al*., 2015; Chou, Hsieh, & Pan 2024). Hence, it is concluded that mindfulness state moderates the relation between attitude and intention to use online learning.

Propose Framework

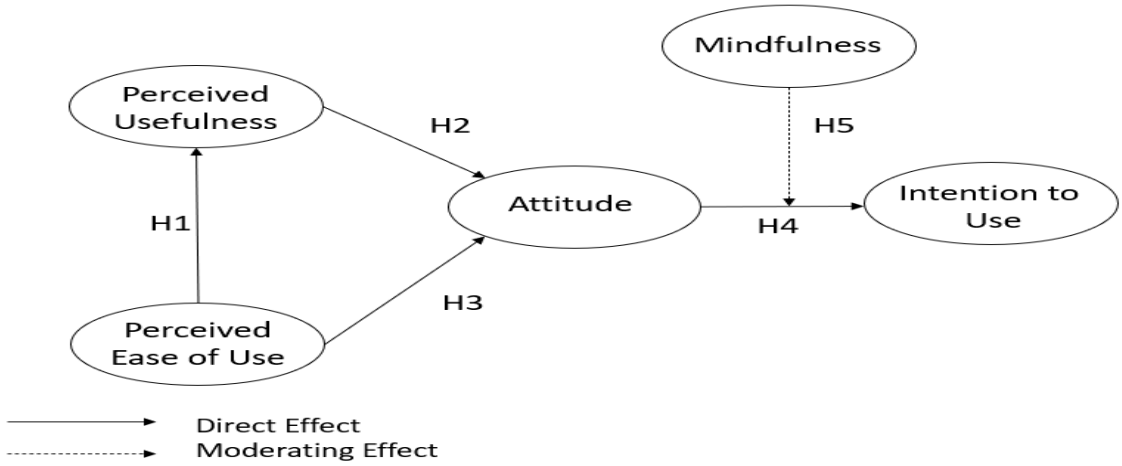

Figure 1: Proposed Conceptual Framework

Discussion

This study aims to investigate the role of mindfulness in adoption of technology in the field of education by building a conceptual framework. The current study is an attempt to find an answer to "Why adoption of technology varies among students undergoing higher education?". Since the state of mindfulness plays a major role in the adoption behaviour, this study extends the most widely accepted model of technology acceptance TAM, by including mindfulness as a moderating variable between attitude and intention to use online learning. Based on a review of the literature that is

currently available, the perceived usefulness and the perceived ease of use related to online learning contribute to the growth of a positive attitude toward technology adoption, which in turn manifests itself in the intention to use the online platforms. In addition, to this level of mindfulness moderates the relation between attitude towards online learning and intention to use learning technologies.

Keeping pace with the advancement in technology, its use in the education sector has become inevitable. Given the preconditions, academic institutes as well as practitioners need to undertake positive measures to facilitate adoption of internet-based platforms in the field of education.

Conclusion

The present study concludes that perceived usefulness, perceived ease of use, attitude, and intention to use are the essential drivers to understand the acceptance of technology in online learning. In addition to the existing components of TAM, it is necessary to study the mindfulness state of the students so that the gap between attitude and behavioral intention can be understood. As a matter of fact, digital learning technology services must be constructed in line with students' level of technological acceptance and intent to continue using it. Future studies should explore the proposed conceptual framework empirically and validate the model identified in this analysis to substantiate the findings of this study. Likewise, the current findings highlight that the industry practitioners involved in developing and using online platforms should have a thorough understanding of the various factors affecting user acceptance of an e-learning system to optimize its usage. Nonetheless, the findings provide a significant update to existing models of technology acceptance used in online learning literature. This research not only enriches the existing literature in a variety of ways, but it also supports practitioners and researchers in improving their knowledge of user behaviour in the context of online learning.

Conflict of Interest

The authors declare that they have no conflict of interests.

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