*Original Research Article*

Understanding the Digital Generation: The Role of Perceived Ease of Use, Perceived Usefulness, and Satisfaction in Users’ Acceptance Intention of the Ruangguru Application Among Generations Y, Z, and Alpha

.

ABSTRACT

|  |
| --- |
| The rapid advancement of digital technology has transformed consumer behaviour in the education sector, influencing how users engage with online learning platforms such as Ruangguru. However, user acceptance of these platforms remains inconsistent, necessitating a deeper understanding of the factors driving adoption. This study examines the impact of perceived ease of use (PEOU) and perceived usefulness (PU) on acceptance intention while also exploring the role of satisfaction in shaping user engagement. Using an online survey, data were collected from 200 respondents who had previously used Ruangguru and analyzed through Partial Least Squares-Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. The findings reveal that while perceived ease of use does not directly influence acceptance intention, it significantly enhances perceived usefulness and satisfaction. Perceived usefulness, in turn, has a strong positive impact on both satisfaction and acceptance intention. These insights contribute to marketing literature on consumer adoption of digital services, particularly in the context of online learning. From a practical perspective, this study underscores the importance of feature innovation, service quality improvement, and user experience optimization to enhance consumer satisfaction, drive engagement, and strengthen brand loyalty in the competitive digital education market. |

*Keywords: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Satisfaction Acceptance Intention, E-Learning, Ruangguru*

1. INTRODUCTION

The rapid advancement of information and communication technology (ICT) has significantly impacted various aspects of life, including education (GoodStats, 2024a). E-learning, or online learning, has experienced substantial growth in recent years due to technological advancements and increasing internet accessibility. This transformation began when traditional educational methods were replaced by e-learning following the emergence of the COVID-19 pandemic, which rendered face-to-face interactions in educational institutions a high-risk factor for virus transmission (Maatuk et al., 2022). In response, most educational institutions worldwide transitioned to online learning formats, utilizing various learning technologies (Gautam & Gautam, 2021).

E-learning offers lower educational costs and is perceived as more effective than traditional learning methods. It facilitates faster dissemination of learning processes and the adoption of new techniques, thereby mitigating geographical barriers (Aljawarneh, 2020). E-learning is defined as a technological system used to deliver instruction. In contrast, participation in e-learning refers to the use of telecommunication to access teaching and learning through such systems (Nikou & Maslov, 2021). It is a practical and feasible learning method that leverages advancements in electronic media and the internet to transfer knowledge and skills to individuals and organizations anytime and anywhere (Nguyen et al., 2020).

The origins of e-learning can be traced back to early forms of distance education, which utilized correspondence mail, television, and radio to deliver remote instruction (Salybekova et al., 2023). Educational institutions have continuously explored effective ways to teach students via the Internet while providing them with meaningful learning experiences (Han & Sa, 2022). Traditional teaching systems in conventional settings are often regarded as a "one-size-fits-all" approach, meaning that all students are subjected to the same learning procedures (El-Sabagh, 2021). In contrast, online learning frequently incorporates specialized modules designed to support asynchronous learning, enabling students to learn independently and separate from traditional teaching methods (Logan et al., 2021).

However, external regulations and learning orientation remain challenging to implement in online learning and require significant resources. Further research is needed to determine effective strategies for integrating these aspects into digital education (Rasheed & Wahid, 2021). E-learning systems must evolve to provide intelligent services. Innovative technologies are increasingly being employed to collect, process, analyze, store, and visualize large volumes of data from various learning sources (Liu & Yu, 2023).

The rapid development of online learning platforms necessitates that educators identify students' levels of engagement during classes (Bhardwaj et al., 2021). Personalized online learning systems are reshaping the interaction between professors and students, with genuine innovation only being realized when educational outcomes from online learning surpass those of face-to-face instruction. To implement practical online classes and utilize the learning data generated, new educational approaches are required to cultivate talents that contribute positively to the Fourth Industrial Revolution (4IR) (Han & Sa, 2022). Thanks to smartphones, immersive gaming software, and other rapidly advancing technologies, the learning process can become more effective, accessible, and progressive compared to traditional methods (Stecuła & Wolniak, 2022).

The term "e-learning" is often used interchangeably with various other concepts, such as mobile learning (m-learning), distance learning (d-learning), online learning, remote learning, online training, and digital learning (Djeki et al., 2022). Within the e-learning context, engagement involves both emotional and physical interactions, including system usage. As learners complete assignments, their emotional states can influence how they handle challenges during these tasks (Wu et al., 2022).

According to data from Databoks (2022a), the intensity of internet usage for educational services in Indonesia remains low despite significant potential. The government has introduced digital services such as the Online Student Admission System (PPDB) and Rumah Belajar, complemented by private sector initiatives through educational platforms like Ruangguru, Zenius, and others. However, significant challenges persist, including limited infrastructure, low digital literacy, and negative perceptions of online learning. These factors present significant obstacles to leveraging technology for broader and more equitable educational access. One educational platform that has demonstrated substantial growth is Ruangguru (Databoks, 2022b), as illustrated in Figure 1.

**Fig. 1. The Most Popular Education Startups in Indonesia (2022)**

*Research Findings by Databoks (2022b)*

Based on the data presented in Figure 1, Ruangguru and Zenius were the two most popular educational startups in Indonesia in 2022, with user percentages of 32% and 25%, respectively. These results indicate that these platforms hold a stronger appeal to users compared to other educational platforms. Their popularity reflects a shift in learning patterns as more individuals rely on technology to enhance their education. According to GoodStats (2024), Ruangguru’s latest program, Clash of Champions (CoC), has successfully heightened enthusiasm for education in Indonesia. This program, designed as a game show, brings together top students from prestigious universities across the country to compete in an intellectual showdown (CNN Indonesia, 2024).

Currently, Ruangguru offers a variety of flagship products, including Ruangbelajar, Brain Academy Online, Ruangguru Privat, Roboguru, Roboguru Plus, RuangUji, Skill Academy, and English Academy (Ruangguru.com, 2025). The majority of Ruangguru users are students ranging from school-age learners to university students, who require technology-driven learning services. This user group primarily consists of Generation Alpha, Generation Z, and Generation Y, who heavily rely on technology to support their learning activities. Höfrová et al. (2024) classify generations based on birth years as follows: Baby Boomers (1946–1964), Generation X (1965–1979), Millennials or Generation Y (1978–1996), Generation Z (1997–2009), and Generation Alpha (2010–2025). Given the characteristics of these user generations and the challenges in adopting educational technology, this study aims to explore how digital platforms like Ruangguru can effectively enhance educational quality in the digital era.

Satisfaction plays a crucial role in shaping consumers' intentions to adopt and continue using a technology. It refers to the extent to which users perceive their experience with a service as meeting or exceeding their expectations (Yingqing et al., 2024). In the context of e-learning as an information system within an educational environment, student satisfaction with e-learning quality is of great significance (AlMulhem, 2020). According to Zygiaris et al. (2022), satisfaction is defined as the level of fulfilment expressed by individuals after receiving a service. Several studies have examined the relationship between satisfaction and acceptance intention in e-learning, with findings indicating that satisfaction has a positive and significant effect on acceptance intention (Bailey et al., 2021; Puriwat & Tripopsakul, 2021; Saqr et al., 2024; T. Wang et al., 2021; Zardari et al., 2021). However, this contradicts the findings of Sae-tae & Wang (2024), who reported that satisfaction does not significantly influence acceptance intention.

Acceptance intention is the primary dependent variable in research based on the Technology Acceptance Model (TAM). It is defined as an individual's tendency to utilize information systems and educational technologies (Alturki & Aldraiweesh, 2021). The intention to use digital learning platforms is described as the likelihood that an individual will engage with such platforms (Songkram et al., 2023). According to Shirahada & Zhang (2022), intention reflects the effort an individual invests in a particular behavior and is influenced by three key elements: subjective norms, attitudes, and perceived behavioral control. Moreover, intention is considered a crucial factor in determining whether users will actually adopt a technology (Rizun & Strzelecki, 2020). While research often focuses on students’ intentions to adopt e-learning systems, faculty members also play an essential role in influencing adoption decisions (Kurdi et al., 2020).

Perceived ease of use (PEOU) is a fundamental determinant of users' attitudes and behavioural intentions toward technology adoption (Chawla & Joshi, 2023). It refers to the degree to which users perceive a system as easy to use compared to traditional methods of performing a task (Balakrishnan & Dwivedi, 2024). In the context of e-learning, perceived ease of use pertains to how intuitive the platform is, how well users can understand its features, and how easily they can interact with available tools and resources (Salybekova et al., 2023). Enhancing perceived ease of use is a strategic approach to overcoming consumer resistance to behavioural change (Choe et al., 2021). It also reflects an individual's confidence in how convenient and effortless a particular technology is to use (Yuan et al., 2021).

Equally important is perceived usefulness (PU), which, alongside perceived ease of use, influences users' behavioural intentions and ultimately determines actual technology adoption (Tiwari et al., 2021). Perceived usefulness is defined as the extent to which users believe that using a particular technology will enhance their performance (Naruetharadhol et al., 2021). In the realm of e-services, perceived usefulness is a critical factor affecting various online activities, including searching, shopping, booking, and digital transactions (Kim et al., 2022). Consequently, various strategies have been proposed to improve perceived usefulness. Users' perceptions of a technology's usefulness significantly impact their adoption decisions (Owusu et al., 2021). Although e-learning is considered an e-service provided by universities, students may perceive its usefulness differently from other e-services, given their unique educational needs and expectations (Kim et al., 2022).

Several studies have examined the relationships influencing satisfaction and its impact on acceptance intention. Research suggests that satisfaction can be influenced by perceived ease of use (Akdim et al., 2022; Duy Phuong et al., 2020; Filieri et al., 2021; Mishra et al., 2023; Sayaf et al., 2021) and perceived usefulness (Al-Adwan et al., 2021; Al-Hattami, 2021; I. H. Chang & Chen, 2020; Chen et al., 2021; Gupta et al., 2021). However, these findings contrast with Li (2021), who reported that perceived ease of use does not have a significant impact on satisfaction. Similarly, Tena et al. (2024) found that perceived usefulness does not significantly influence satisfaction.

Given these inconsistencies in prior research, this study seeks to explore further the relationships between perceived ease of use, perceived usefulness, and satisfaction, as well as their impact on acceptance intention in e-learning adoption. This investigation is motivated by research gaps and inconsistencies in previous findings. In conclusion, existing literature has not yet provided consistent results. This study re-examines the influence of these variables using the Technology Acceptance Model (TAM). This research is essential for re-evaluating the effects of these variables and their implications for educational technology adoption.

2. literature review

2.1 The Technology Acceptance Model (TAM) Theory

This study employs the Technology Acceptance Model (TAM), initially introduced by Davis in 1986. This theory is an adaptation of the Theory of Reasoned Action (TRA), first proposed by Fishbein and Ajzen (1975), which is widely recognized as a framework for understanding user acceptance of technology. TAM focuses explicitly on user acceptance of information systems, replacing many of the attitudinal measures in TRA with two key constructs: perceived usefulness and perceived ease of use (Salybekova et al., 2023). The Technology Acceptance Model is a widely applied and frequently modified framework that analyzes the determinants of user adoption of innovative technologies (Holdack et al., 2022).

TAM has been extensively used to predict the adoption of various technologies, including mobile services, e-commerce, enterprise systems, and healthcare technologies (Salybekova et al., 2023). It has also been widely utilized in studies investigating e-learning adoption (Mailizar, Almanthari et al., 2021). Referring to the study by Al-Adwan et al. (2021) on e-learning adoption based on TAM-related models, previous research has successfully predicted e-learning adoption and post-adoption behaviours (such as usage and continued engagement). However, such studies often overlook the influence of these behaviours on learning outcomes. TAM provides a valuable analytical framework for examining the use and adoption of information technology by incorporating perceived usefulness, perceived ease of use, and behavioural intention as key variables (Han & Sa, 2022; Nguyen et al., 2020; Salybekova et al., 2023) in e-learning systems.

2.2 Perceived Ease of Use and Perceived Usefulness

Various studies have demonstrated a positive relationship between perceived ease of use and perceived usefulness in e-learning activities and educational technology adoption (Gurban & Almogren, 2022; He et al., 2023; Humida et al., 2022; Nikou & Maslov, 2021; Zheng et al., 2023). E-learning platforms must prioritize user-friendliness, simplicity, and intuitive design to enhance users' perception of ease of use while simultaneously fostering students’ intention to engage with the platform (Salybekova et al., 2023). Perceived ease of use refers to the extent to which individuals believe that using a particular technology requires minimal effort, as well as confidence in their ability to use the technology easily (Kolade et al., 2022). In an educational context, students’ confidence in the ease of use and benefits of information and communication technology (ICT) serves as a crucial foundation for developing perceptions of ease of use (Sayaf et al., 2021). The easier an e-learning system is to use, the more likely it is to be adopted, thereby increasing its overall utilization (Gurban & Almogren, 2022). This condition may encourage greater intention to optimize technology for various activities, including technology-based education.

Previous studies have highlighted the significant influence of perceived ease of use on users’ perceived usefulness in e-learning (Baji et al., 2022; He et al., 2023; Nikou & Maslov, 2021). First, He et al. (2023) found that perceived ease of use in e-learning is positively and significantly related to perceived usefulness, indicating that platforms with higher usability are more likely to be considered beneficial, with an effect size more significant than in previous studies. Second, Baji et al. (2022) reinforced this relationship by confirming a significant positive association between perceived ease of use and perceived usefulness in e-learning, demonstrating that user-friendly platforms enhance students’ perception of usefulness and technology acceptance. Third, Fülöp et al. (2023) highlighted the link between perceived ease of use, perceived usefulness, and academic success. Their study indicated that e-learning platforms that are easier to use and perceived as beneficial can significantly enhance students' educational outcomes, underscoring the importance of optimizing user experience to support academic achievement.

The positive relationship between perceived ease of use and perceived usefulness is further confirmed by Saleh et al. (2022), who found that perceived ease of use significantly enhances perceived usefulness in e-learning. Their regression analysis revealed a strong correlation between the two variables, demonstrating that users who find a system more straightforward to use tend to hold more positive views regarding its usefulness. However, some studies have reported contradictory findings. For instance, Sagnier et al. (2020) found that in the context of virtual reality applications, users did not consider ease of use as a necessary factor in determining the usefulness of the technology. This finding contrasts with many prior studies that typically report a significant effect of perceived ease of use on both intention to use and perceived usefulness. Perceived ease of use in e-learning systems is believed to influence users' perception of the system's benefits, suggesting that perceived ease of use enhances perceived usefulness. Based on this discussion, the following hypothesis is proposed:

H1: Perceived ease of use has a positive effect on perceived usefulness in e-learning.

2.3 Perceived Ease of Use and Satisfaction

The positive relationship between perceived ease of use and satisfaction in the context of e-learning has been demonstrated in several previous empirical studies (Chiang et al., 2019; Han & Sa, 2022; Saqr et al., 2024; Sayaf et al., 2021). Research indicates that educational satisfaction and the intention to accept online learning can be enhanced through technology and information that support ease of use and perceived usefulness (Han & Sa, 2022). The concept of ease of use in this analysis refers to students' perceptions of how an e-learning system can improve their learning and academic performance (Alyoussef, 2021). Perceived ease of use, which is also defined as the extent to which learners find e-learning easy to use, is one of the key criteria in the original TAM model (Gurban & Almogren, 2022).

When acquiring new knowledge, students believe that digital technology positively supports self-directed learning, is easy to use, and does not impose an additional burden on the learning process (Tsai et al., 2021). The intention to use e-learning is strongly influenced by users’ satisfaction levels and their perception of the system's ease of use (Kashive et al., 2020). When the perceived ease of use is high, users feel more supported by the platform in improving their satisfaction and performance while simultaneously recognizing its benefits (Xu et al., 2022). User satisfaction is a crucial predictor of system success. It needs to be integrated with other approaches to connect different phases of the system and maximize its predictive potential in influencing learning benefits and assessing system effectiveness (Al-Fraihat et al., 2020).

Several prior studies have emphasized the positive causal relationship between perceived ease of use and satisfaction (Chiang et al., 2019; Han & Sa, 2022; Sayaf et al., 2021). Chiang et al. (2019) stated that the perception of ease of use in an e-learning system affects user satisfaction. In contrast, a system that is easy to navigate and offers personalized content can enhance satisfaction. Previous research also confirms that perceived ease of use in online classes contributes to increased student satisfaction, particularly when classes are easily accessible and user-friendly (Han & Sa, 2022). However, differing findings were reported by Li (2021), who revealed that while ease of use is an important factor, it does not directly influence satisfaction among EFL learners in China using Automated Writing Evaluation (AWE). Instead, satisfaction was more strongly affected by perceived usefulness and users’ confirmation of expectations. Despite these variations, Sayaf et al. (2021) reaffirmed that in the broader e-learning context, ease of use continues to contribute to increased student satisfaction.

Furthermore, ease of use also plays a role in enriching learning experiences and supporting sustainable learning practices. Therefore, diverse educational services must be developed to ensure continuous student satisfaction and acceptance of online education (Han & Sa, 2022). Based on previous research, perceptions of ease of use, such as intuitive navigation, personalized content, and easy access to online classes, significantly enhance user satisfaction in e-learning, strengthen learning experiences, and support sustainable education. Based on this discussion, the following hypothesis is proposed:

H2: Perceived ease of use has a positive effect on satisfaction in e-learning.

2.4 Perceived Usefulness and Satisfaction

Several studies have demonstrated a positive relationship between perceived usefulness and satisfaction in the context of digital learning (Al-Fraihat et al., 2020; Almogren, 2022; I. H. Chang & Chen, 2020; Saqr et al., 2024). Similar to perceived ease of use, which has been previously discussed, perceived usefulness is also a critical factor influencing satisfaction. Perceived usefulness is defined as the extent to which users believe that using a system will enhance their performance or experience (Chiang et al., 2019). According to Rizun and Strzelecki (2020), the perceived usefulness of technology, particularly tools used for remote learning in higher education, is one of the key elements in the Technology Acceptance Model (TAM). Al-Adwan et al. (2021) further emphasize that TAM integrates perceived usefulness and perceived ease of use as the primary determinants of e-learning adoption behaviour.

Users generally feel satisfied with products or services that meet or exceed their expectations in terms of functionality, performance, and benefits (Mishra et al., 2023). In the context of online learning platforms, a high level of confirmation—defined as the alignment between initial expectations and post-usage experiences—is a crucial factor in determining student satisfaction, significantly when the experience surpasses their expectations (Wang et al., 2021). More broadly, satisfaction is defined as an emotional assessment of the outcomes obtained, encompassing both subjective views of what is perceived as enjoyable or disruptive (Alzahrani & Seth, 2021).

A study on e-learning systems by Al-Fraihat et al. (2020) explains that superior technical quality, combined with compatibility with user needs, can enhance satisfaction, encourage more enthusiastic use, and strengthen perceptions of usefulness. Meanwhile, a study on users of educational platforms such as Blackboard found that perceived usefulness enhances satisfaction, fosters continued use and contributes to a more effective learning experience, particularly during and after the COVID-19 pandemic (Almogren, 2022).

Previous research on satisfaction in e-learning (Saqr et al., 2024) reaffirms the positive relationship between perceived usefulness and user satisfaction. The findings indicate that perceived usefulness significantly enhances user satisfaction in e-learning platforms, where higher perceived usefulness contributes to greater satisfaction. These findings also highlight the importance of both perceived usefulness and perceived ease of use in creating a positive user experience in online learning environments. However, different results were observed in a study by Tena et al. (2024) in the context of tourism services, where perceived usefulness did not significantly affect satisfaction despite a higher level of usefulness being associated with increased satisfaction. The Kano method used in the study revealed that a lack of usefulness did not lead to significant dissatisfaction, suggesting that other factors, such as trust in the model, play a more critical role in determining satisfaction and should be improved to enhance user acceptance. Nevertheless, perceived usefulness has been shown to have a significant impact on satisfaction (Al-Hattami, 2021).

From this perspective, the relationship between perceived usefulness and user satisfaction should be carefully considered. Although higher usefulness is associated with increased satisfaction, other factors, such as perceived ease of use within the model, also play a crucial role in determining satisfaction, particularly in the context of e-learning platforms. Perceived usefulness is believed to influence user satisfaction in e-learning. Based on this discussion, the following hypothesis is proposed:

H3: Perceived usefulness has a positive effect on satisfaction in e-learning.

2.5 Perceived Ease of Use and Acceptance Intention

Previous studies in the context of e-learning have demonstrated a strong relationship between perceived ease of use and acceptance intention (Han & Sa, 2022; Humida et al., 2022; Zardari et al., 2021; Zheng et al., 2023). Perceived ease of use is a key factor influencing users’ attitudes and behavioural intentions toward a system such as e-learning (Weerathunga et al., 2021). A positive perception of ease of use and system usefulness can strengthen user attitudes, ultimately increasing their intention to adopt the technology (Choe et al., 2021). Perceived ease of use refers to the extent to which an individual believes that using a system will be effortless (Tawafakroof et al., 2020).

In the context of online education, perceived ease of use describes the extent to which students feel that an e-learning system is easily accessible without requiring significant effort (Al-Rahmi et al., 2021). A study by Baji et al. (2022) confirms that both perceived ease of use and perceived usefulness significantly impact students' intentions to use e-learning. Furthermore, the influence of perceived ease of use on perceived usefulness and the intention to use technology becomes stronger when users have a higher level of technological literacy (Chang & Chen, 2021). Improving the perception of a technology’s ease of use not only positively affects its perceived usefulness but also encourages broader adoption and utilization (Tawafak et al., 2023). Additionally, a curriculum design that aligns with students' needs can enhance the learning experience, ultimately leading students to prefer online learning (Lin et al., 2021).

Behavioural intention, defined as the internal force that drives an individual to act (Wang et al., 2023), plays a crucial role in determining students' learning performance. This performance is influenced by students’ intentions to use social media and how actual social media usage can enrich their learning experience (Al-Rahmi et al., 2021). As many educational institutions transition to e-learning to maintain learning continuity, understanding the factors influencing students' intentions to use such systems has become increasingly important (Baber, 2021). Perceived usability has been proven to be a strong predictor of usage intention, even amid technological changes and advancements (Sprenger & Schwaninger, 2023).

The positive relationship between perceived ease of use and acceptance intention in e-learning has been explored by several researchers (Han & Sa, 2022; Humida et al., 2022; Zardari et al., 2021). Han and Sa (2022) found that perceived ease of use enhances the usefulness and satisfaction of education; however, acceptance intention is more influenced by external factors such as the urgency of adaptation during the COVID-19 pandemic. Similarly, Zardari et al. (2021) revealed that perceived ease of use significantly affects behavioural intention and users’ perceptions of e-learning portals, emphasizing that user-friendly design increases trust in system benefits and promotes technology adoption in higher education. Furthermore, Humida et al. (2022) stated that perceived ease of use in e-learning significantly enhances perceived usefulness and behavioural intention to adopt the system. Their findings highlight a positive relationship between perceived ease of use, perceived usefulness, and acceptance intention, underscoring the importance of positive experiences and supportive resources in encouraging technology adoption.

Perceived ease of use has been proven to play a critical role in driving acceptance intention toward e-learning. A positive perception of ease of use not only strengthens perceived usefulness but also enhances students' behavioural intentions to adopt the technology. User-friendly system design, positive experiences, and supportive resources are key factors influencing the adoption of educational technology. Based on this discussion, the following hypothesis is proposed:

H4: Perceived ease of use has a positive effect on acceptance intention in e-learning.

2.6 Perceived Usefulness and Acceptance Intention

The positive relationship between perceived usefulness and acceptance intention has been widely discussed in the e-learning literature (Al-Maroof et al., 2020; Tawafak et al., 2023; T. Wang et al., 2021). The perceived usefulness of a product or service can be measured through users’ perceptions of the expected benefits of its use (Liébana-Cabanillas et al., 2021). As one of the most important original constructs in the technology acceptance model (TAM), perceived usefulness has been extensively studied as a central variable in the adoption intention of new technologies (Al-Qudah et al., 2024). Users’ perceptions of both perceived ease of use and perceived usefulness can help developers prioritize the effectiveness of these features in future digital tools (Almaiah et al., 2022). When students perceive an e-learning system as applicable, they are more likely to develop an intention to use or continue using the system (Alkhawaja et al., 2022). Consumers’ intention to use a system is significantly influenced by their perceptions of its usefulness (To & Trinh, 2021).

The intention to use e-learning is defined as the likelihood of users adopting electronic learning to facilitate educational advancement (Hunde et al., 2023). Attitudes toward mobile learning (M-learning) and perceived usefulness are key determinants of students’ intention to adopt M-learning (Qashou, 2021). In the context of e-learning, the impact of perceived usefulness on usage intention is more significant than the attitude toward e-learning, indicating that perceived usefulness, as an extrinsic factor, should be a primary focus (Liao et al., 2022). When consumers exhibit a high level of behavioural intention to use new technology, they are more likely to adopt it (Choe et al., 2021). Technologies perceived as more convenient tend to be used more frequently by consumers (Han & Sa, 2022).

The positive relationship between perceived usefulness and acceptance intention has been empirically investigated by several researchers (Al-Maroof et al., 2020; T. Wang et al., 2021). These studies indicate that users' confidence in a technology’s capabilities significantly enhances their performance, thereby driving acceptance intention and technology adoption. Perceived usefulness has also been shown to have a more significant impact than perceived ease of use in promoting continuous use, with a direct correlation to the level of acceptance and sustainable usage by teachers and students (Al-Maroof et al., 2020). Furthermore, findings from T. Wang et al. (2021) indicate that a high perception of e-learning usefulness significantly increases students’ intention to continue using the platform. However, this contrasts with the study by Mailizar et al. (2021), which found that during the COVID-19 pandemic, perceived usefulness did not significantly influence students’ behavioural intention to use e-learning, suggesting a shift in user perceptions where other factors became more influential in technology adoption. In contrast, an empirical study on perceived usefulness and intention in e-learning by Al-Rahmi et al. (2021) emphasized that a high perception of usefulness encourages students to utilize social media, especially when they believe the platform enhances their academic performance.

Perceived usefulness has been proven to play a significant role in driving technology acceptance and sustainable use, particularly in the context of online learning and social media. The perceived benefits of a technology are believed to influence users’ intention to continue utilizing it significantly. Based on this discussion, the following hypothesis is proposed:

H5: Perceived usefulness has a positive effect on acceptance intention in e-learning.

2.7 Satisfaction and Acceptance Intention

Previous studies have emphasized the positive relationship between satisfaction and acceptance intention in the context of e-learning (Almogren, 2022; Han & Sa, 2022; Li, 2021; Zardari et al., 2021). Measuring student satisfaction with online learning is a crucial aspect of ensuring the success of the educational process for institutions, instructors, and students (Mohammed et al., 2022). This reflects the extent to which the collaboration between an information system and its users can be considered successful (Hussein et al., 2021). Achieving satisfaction can be done by providing continuous value-added services to enhance user comfort and effectiveness (Liébana-Cabanillas et al., 2021). The emotional assessment of perceived outcomes also influences satisfaction, whether they are pleasant or frustrating (Alzahrani & Seth, 2021). In the learning context, student satisfaction is achieved when the learning process meets or even exceeds their expectations, whereas dissatisfaction arises when these expectations are not met (Huang, 2021).

The increasing acceptance of online courses that provide satisfaction can encourage the formation of new learning habits, ultimately strengthening students’ intention to adopt this learning model sustainably (Lin et al., 2021). Satisfaction plays a significant role, as higher satisfaction levels are associated with an increased intention to continue using the system. Satisfied users are not only more likely to continue using the technology but also more inclined to recommend it to friends, family, and colleagues (Hoang & Le Tan, 2023). This result aligns with the view that customer satisfaction has a significant impact on their behavioural intentions (Sharabati et al., 2022). Based on the Technology Acceptance Model (TAM), intention is understood as a dependent variable that reflects the likelihood of users adopting a particular system (Elhajjar & Ouaida, 2020). Theoretical perspectives suggest that students need to be satisfied with the quality of education provided and the relevance of information delivered through online classes in order to accept this service. Increasing student satisfaction with learning experiences is a crucial priority, especially in overcoming resistance to online learning (Han & Sa, 2022).

Several studies have shown that satisfaction is a key supporting factor in acceptance intention in e-learning (Almogren, 2022; Han & Sa, 2022; Zardari et al., 2021). A study by Han and Sa (2022) found that to encourage higher acceptance intentions, educational service providers should focus on enhancing student satisfaction, both through improving content quality and managing user experiences on online learning platforms. Furthermore, a study by Silva et al. (2023) demonstrated that user satisfaction plays a significant role in supporting acceptance intention or the continued use of technology-based services, including e-learning and chatbots. Satisfaction serves as a primary factor that increases users' intention to reuse the service and positively impacts acceptance intention.

Another study supporting the positive relationship between satisfaction and acceptance intention in e-learning was conducted by Almogren (2022). User satisfaction serves as a key factor in supporting e-learning acceptance through the significant influence of perceived benefits and ease of use. The findings indicate that user satisfaction with an e-learning platform strengthens behavioural intention to continue using the platform, thereby enhancing the effectiveness of e-learning implementation. Additionally, research from a different perspective suggests that user satisfaction with free e-learning services may reduce users’ intention to switch to paid or premium services, as high satisfaction with free services hinders the intention to accept or purchase additional services (Sae-tae & Wang, 2024).

Service providers must understand the role of user satisfaction despite the various factors influencing acceptance intention in e-learning. Satisfaction is often the primary factor driving the intention to continue using a service, ultimately enhancing the effectiveness of e-learning implementation. Therefore, satisfaction is one of the main predictors of successful e-learning service acceptance. Based on this discussion, the following hypothesis is proposed:

H6: Satisfaction has a positive effect on acceptance intention in e-learning.

3. methodology

3.1 Measurement

This study examines the role of perceived ease of use and perceived usefulness in influencing user satisfaction and acceptance intention toward the Ruangguru application. Employing a causal relationship approach, this research analyzes cause-and-effect linkages through hypothesis testing. Primary data were collected directly from respondents using a quantitative method, with an online questionnaire distributed via Google Forms. The study investigates two independent variables (perceived ease of use and perceived usefulness), one mediating variable (satisfaction), and one dependent variable (acceptance intention). All variables were measured using a six-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The six-point scale was chosen to minimize response bias and capture nuanced opinions, as suggested by Yamashita (2022). Compared to the traditional five-point scale, the inclusion of “somewhat agree” and “somewhat disagree” options encourage respondents to make more apparent distinctions, leading to more precise results.

3.2 Sampling and Data Collection

This study was conducted in Indonesia without specific geographical limitations, as data collection was carried out online and was not restricted to any particular region. Additionally, the adoption of e-learning in Indonesia has been widespread, with Ruangguru being one of the most popular platforms. According to a survey on the most well-known educational startups in Indonesia conducted by Databoks (2022) with 890 respondents, Ruangguru was recognized as the most widely known educational startup, with 98% of respondents being familiar with it. Furthermore, the survey indicated that Zenius ranked second with a recognition rate of 76%, followed by Akademi (31%), Pahamify (29%), and Cakap (28%). Based on this data, Indonesia is selected as the research location deemed appropriate for studying educational startups.

The population in this study comprises Indonesian individuals who have used or are currently using the Ruangguru application, ensuring that the findings are applicable and relevant to this group. In this context, Ruangguru's e-learning platform serves as the primary research subject. Thus, the study sample consists of users of the Ruangguru application in Indonesia, either past or present. The sample is obtained using the convenience sampling technique, which involves selecting participants from an easily accessible subset of the population. This method is chosen as it allows researchers to acquire samples quickly and efficiently. Respondents in this study must meet the following criteria: Indonesian citizens who are users of the Ruangguru application.

The sample size is determined by summing the total number of indicators and latent variables, then multiplying the result by five for the minimum sample size or by ten for the maximum sample size (Hair et al., 2010). This study includes 16 question indicators and four latent variables, resulting in a target sample size ranging from a minimum of 80 respondents to a maximum of 200 respondents (Hair et al., 2019).

3.3 Data Analysis Techniques

At the initial stage, a pilot test was conducted to enhance the reliability and validity of the research instrument. This test involved distributing an online questionnaire to 43 respondents who met the research criteria. The primary objective of the pilot test was to ensure that the questionnaire was appropriate for distribution to the primary research respondents. After collecting the pilot test data, validity and reliability analyses were performed using SPSS software. The results of the pilot test indicated that the measurement model in this study was valid and reliable.

This study employs both descriptive and statistical analyses to examine the collected data. Descriptive analysis is used to systematically and comprehensively describe the characteristics of the data. Specifically, it is applied to present respondent characteristics and to identify each construct under investigation. The primary objective is to provide an overview of respondent demographics and analyze survey responses for each research variable. The respondent characteristics analyzed include gender, age, educational background, and the e-learning platform used. Additionally, item analysis covers variables such as perceived ease of use, perceived usefulness, satisfaction, and acceptance intention to gain a deeper understanding of respondents’ perceptions of these constructs.

This study employs the Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach, conducted using SmartPLS 4 software. PLS-SEM is utilized to test hypotheses by analyzing the relationships between variables within the model. Structural Equation Modeling (SEM) is a statistical analysis method used to examine and understand complex relationships among multiple variables simultaneously through model visualization and validation (Dash & Paul, 2021). The model assessment consists of two main components: (1) the measurement model (outer model), which describes the relationship between latent variables and their indicators, and (2) the structural model (inner model).

The measurement model assessment includes the evaluation of validity and reliability. Validity is tested using both convergent and discriminant validity. Convergent validity is assessed by ensuring that factor loadings exceed 0.7 (Hair et al., 2021) and that the average variance extracted (AVE) is more significant than 0.5 (Yu et al., 2022). Discriminant validity is examined using the Fornell-Larcker criterion and The Heterotrait-Monotrait (HTMT) ratio, with standard thresholds between 0.85 and 0.90 (Hair et al., 2021). Furthermore, reliability is assessed using Cronbach's alpha and composite reliability, with a minimum threshold of 0.6 (Hair et al., 2021). Meanwhile, the structural model assessment includes collinearity testing, where the variance inflation factor (VIF) should be below 5 to avoid serious multicollinearity issues. The determination coefficient (R-square) and predictive relevance (Q-square) are also evaluated. Finally, path coefficient analysis is conducted to determine hypothesis direction and hypothesis testing.

4. results and discussion

**4.1 Respondent Characteristics**

This section presents the results of data analysis, categorized based on respondent profiles, including factors such as gender, age range, highest level of education, and the e-learning platform used. The respondents' profiles are summarized in Table 1.

**Table 1. Respondents’ Profile**

|  |  |  |
| --- | --- | --- |
| **Categories** | **Frequency** | **%** |
| **Gender**MaleFemale | 24178 | 12.088.0 |
| **Age**< 15 years16 - 28 years29 - 47 years> 48 years | 7182101 | 3.591.05.00.5 |
| **Last education**Junior High School or EquivalentSenior High School or EquivalentDiplomaBachelor's DegreePostgraduate (Master's/Doctoral) | 811019612 | 4.055.09.530.51.0 |

Source: Primary data (2025).

Table 1 indicates that the majority of respondents in this study are female. A total of 178 female respondents accounted for 88% of the sample, while 24 male respondents represented 12% of the total. These findings suggest that most Ruangguru users in this study are female. The results show that most respondents are aged 16-28 years, totalling 182 individuals or 91% of the sample. The majority of respondents in this study have a senior high school education or equivalent. Out of 200 respondents, 110 (55%) have completed senior high school.

**4.2 Measurement Model (Outer Model)**

The measurement model in this study was assessed through validity and reliability tests to ensure the accuracy and consistency of the constructs. The evaluation was conducted using SmartPLS with the PLS Algorithm. First, convergent validity was examined by assessing outer loading values above 0.7 (Hair et al., 2021) and average variance extracted (AVE) greater than 0.50 (Yu et al., 2022). Convergent validity measures the extent to which different indicators intended to assess the same construct are strongly correlated, even when different measurement methods are applied (Hair et al., 2021). Next, discriminant validity is the opposite of convergent validity, meaning that indicators within a construct are strongly correlated but do not exhibit a significant relationship with different constructs (Neuman, 2014). Lastly, reliability testing assesses the stability of measurement results obtained through repeated evaluations under the same conditions using the same measurement instrument (Sürücü & Maslakçi, 2020). A more reliable measurement instrument produces a higher level of consistency compared to a less reliable one (Hair et al., 2019). The results of the convergent validity and reliability tests are presented in Table 2.

**Table 2. Data Convergent Validity and Reliability**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Item** | **Loadings** | **CA** | **CR** | **AVE** |
| Acceptance Intention (AI) | AI.1AI.2AI.3AI.4 | 0,8240,7970,8530,813 | 0,840 | 0,893 | 0,676 |
| Perceived Ease of Use (PEOU) | PEOU.1PEOU.2PEOU.3PEOU.4 | 0,8600,9290,9060,784 | 0,840 | 0,893 | 0,760 |
| Perceived Usefulness (PU) | PU.1PU.2PU.3PU.4 | 0,8690,8800,8840,858 | 0,896 | 0,927 | 0,762 |
| Satisfaction (SAT) | SAT.1SAT.2SAT.3SAT.4 | 0,8210,9070,9010,8381 | 0,889 | 0,924 | 0,752 |

*Source: Primary data (2025)*

*\*Notes: Perceived Ease of Use (PEOU); Perceived Usefulness (PU); Satisfaciton (SAT); Acceptance Intention (AI).*

Table 2 demonstrates that all variable items have outer loading values exceeding 0.7 and AVE values above the required threshold of 0.50 (Hair et al., 2019). Therefore, the findings confirm the convergent validity of the measurement model. Additionally, the reliability test results indicate that all variables meet the reliability criteria, as evidenced by Cronbach’s Alpha and Composite Reliability (CR) values exceeding 0.6 (Hair et al., 2021). This finding suggests that the measurement instrument is acceptable and exhibits strong internal consistency. A higher Cronbach’s Alpha and Composite Reliability value reflects a higher level of reliability for a given variable. For instance, the perceived ease of use variable has Cronbach’s Alpha and Composite Reliability values well above 0.8, indicating excellent reliability. Thus, it can be concluded that all variables in this study meet the reliability standards and can be considered reliable.

Next, discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. The Fornell-Larcker method (1981) evaluates discriminant validity by comparing the square root of the Average Variance Extracted (AVE) for each construct with its correlations with other constructs. The findings indicate that the AVE values for all three constructs exceed the recommended threshold of 0.50, as suggested by Fornell and Larcker (1981), confirming acceptable convergent validity (Yu et al., 2022). The results of the Fornell-Larcker criterion are presented in Table 3.

**Table 3. Disciminant Validity: Fornell-Larcker**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | AI | PEOU | PU | SAT |
| AIPEOUPUSAT | 0,8220,5780,6070,664 | 0,8720,7750,745 | 0,8730,721 | 0,867 |

*Source: Primary data (2025)*

*\*Notes: Perceived Ease of Use (PEOU); Perceived Usefulness (PU); Satisfaciton (SAT); Acceptance Intention (AI).*

Table 3 presents the square root of the AVE values based on the Fornell-Larcker criterion. The analysis results indicate that the square root of the AVE for each variable is higher than its correlations with other variables, confirming that the measurement meets the criteria established by Fornell and Larcker (1981). For instance, the square root of the AVE for the perceived usefulness variable (0.873) is more significant than its correlation with the satisfaction variable (0.721), and a similar pattern is observed across all variables. These findings confirm that all variables in this study demonstrate acceptable discriminant validity.

Next, the HTMT test was conducted. In this analysis, the HTMT value for the perceived usefulness variable relative to perceived ease of use was 0.866, while the HTMT values for other variables remained below 0.85. According to Henseler et al. (2015), an HTMT value exceeding the 0.85 threshold may indicate issues with discriminant validity. This result suggests that specific indicators within the perceived usefulness variable contribute to the high HTMT value, preventing it from meeting the discriminant validity criteria. To address this issue, it is necessary to eliminate the problematic indicator to reduce the HTMT value and improve discriminant validity. An analysis of the average inter-item correlations for PEOU-PU was performed to identify the item with the highest average correlation. As a result, PU1 was removed to enhance data validity in the HTMT test. The adjusted HTMT results are presented in Table 4.

**Table 4. Validity Disciminant: Crossloading Test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | AI | PEOU | PU | SAT |
| AIPEOUPUSAT | 0,6620,6960,766 | 0,8340,837 | 0,806 |  |

*Source: Primary data (2025)*

*\*Notes: Perceived Ease of Use (PEOU); Perceived Usefulness (PU); Satisfaciton (SAT); Acceptance Intention (AI).*

Based on Table 4, the revised HTMT test results indicate that all variables have HTMT values below 0.85, meeting the established criteria. Therefore, the test results are considered acceptable, and all variables in this study can be deemed valid in terms of discriminant validity.

**4.3 Structural Model (Inner Model)**

The structural model assessment was conducted through collinearity testing, path coefficient analysis, determination coefficient (R-square) evaluation, and Q-square analysis. The bootstrapping results for the structural model assessment are presented in Figure 2.



**Fig. 2. Bootsrapping result model**

*Research model diagram during the bootstrapping process in SmartPLS. Data processing results, 2025.*

First, collinearity testing was conducted based on the variance inflation factor (VIF) values (Hair et al., 2021). The results of the collinearity test are presented in Table 5.

**Table 5. Collinearity Test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | AI | PEOU | PU | SAT |
| AIPEOUPUSAT | 3,0612,8382,545 |  | 1,000 | 2,5082,508 |

*Source: Primary data (2025)*

*\*Notes: Perceived Ease of Use (PEOU); Perceived Usefulness (PU); Satisfaciton (SAT); Acceptance Intention (AI).*

Table 5 presents the results of the collinearity test, indicating no significant multicollinearity issues in this study. It happens because the variance inflation factor (VIF) values for all variables remain below the threshold of 5 (VIF < 5). In fact, all VIF values are well below 3, suggesting that multicollinearity is not a concern. For instance, the VIF for the relationship between satisfaction and acceptance intention is 2.545, while the VIF for perceived ease of use and satisfaction is 2.508. Based on these findings, there is no disruptive multicollinearity among the variables in this study.

Next, the coefficient of determination test and predictive relevance test are presented in Table 6.

**Table 6. R-Square and Q-Square Results**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **R-square** | **Adjusted R-square** | **Q-square** |
| Acceptance IntentionPerceived UsefulnessSatisfaction | 0,4760,6010,607 | 0,4680,5990,603 | 0,3280,6050,552 |

*Source: Primary data (2025)*

Table 6 presents the R-square and Q-square results of this study. The coefficient of determination test, measured using R-square, indicates the extent to which independent variables explain the dependent variable. The findings reveal that the R-square values for all three variables exceed 0.330, placing them in the moderate category (0.33 < R² < 0.67) (Chin, 1998). Meanwhile, the Q-square test assesses the predictive relevance of the endogenous construct as predicted by the influencing constructs. A Q-square value greater than 0 indicates acceptable predictive relevance, and the test results confirm that this criterion has been met. Based on these findings, it can be concluded that the research model exhibits strong predictive capability and demonstrates a high degree of fit with the data.

Finally, the path coefficient test was conducted to assess the direction of the hypotheses and evaluate the hypothesis testing results. The direction of the relationship is represented by the original sample value (β), with path coefficients ranging from -1 to +1. Hypotheses were tested using the T-statistic and P-value, where a hypothesis is supported if the T-statistic exceeds 1.96 (T-statistic > 1.96) and considered statistically significant if the P-value is below 0.05 (P-value < 0.05). Table 7 presents the results of the path coefficient analysis.

**Table 7. The Path Coefficient**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hypotheses**  | **β** | **T value** | ***P* Value** | **Conclusion** |
| PEOU 🡪 PU | H1 | 0,775 | 16,173 | 0,000 | Supported |
| PEOU 🡪 SAT | H2 | 0,466 | 5,759 | 0,000 | Supported |
| PU 🡪 SAT | H3 | 0,360 | 4,782 | 0,000 | Supported |
| PEOU 🡪 AI | H4 | 0,059 | 0,559 | 0,576 | Not Supported |
| PU 🡪 AI | H5 | 0,238 | 2,635 | 0,000 | Supported |
| SAT 🡪 AI | H6 | 0,448 | 4,296 | 0,000 | Supported |

*Source: Primary data (2025)*

*\*Notes: Perceived Ease of Use (PEOU); Perceived Usefulness (PU); Satisfaciton (SAT); Acceptance Intention (AI).*

Based on the hypothesis testing results presented in Table 7, all direct hypothesis relationships are accepted and significant, except for the direct relationship between perceived ease of use and acceptance intention (H4), which is not significant and therefore rejected. Additionally, all hypothesis relationships exhibit a positive direction, as indicated by β values greater than zero. Furthermore, the research model in this study is adapted from Han & Sa (2022).

**4.3.1 Effect of Ease of Use on Perceived Usefulness**

The findings of this study indicate that perceived ease of use has a positive and significant impact on perceived usefulness in the context of e-learning (T statistic = 16.173 > 1.96 and P value 0.000 < 0.05). Thus, H1 is supported. This result suggests that the easier an e-learning platform is to use, the higher the users’ perception of its benefits (He et al., 2023; Nikou & Maslov, 2021). These findings align with Han and Sa (2022), who emphasize that perceived ease of use and perceived usefulness are fundamental factors in understanding student interactions with online learning platforms. Educational institutions can enhance students’ perceptions of both ease of use and usefulness, ultimately contributing to higher satisfaction and acceptance of online education.

The Technology Acceptance Model (TAM) identifies perceived usefulness and perceived ease of use as two key determinants influencing user behaviour in e-learning (Al-Adwan et al., 2021). These factors play a crucial role in shaping positive perceptions of educational technology, where ease of access and perceived benefits enhance user engagement and their willingness to continue utilizing e-learning platforms in their learning process. A critical aspect of TAM is the extent to which learners perceive an e-learning platform as intuitive and requiring minimal effort to operate. This factor is essential in understanding how students adapt to and accept digital learning systems (Gurban & Almogren, 2022).

The relationship between perceived ease of use and perceived usefulness can also be linked to respondent characteristics, particularly age, as a key variable analyzed in this study. The majority of respondents (91%) were between 16 and 28 years old, indicating that Ruangguru is predominantly used by younger generations with high digital literacy. This demographic finds it easier to understand and navigate the platform’s features, leading to more frequent usage and more substantial recognition of the platform’s benefits in supporting their learning. The flexibility of access and a seamless learning experience further reinforce their perception of the platform. In conclusion, perceived ease of use plays a vital role in enhancing perceived usefulness, which ultimately drives user acceptance of Ruangguru as their primary e-learning platform.

**4.3.2 Effect of Perceived Ease of Use on Satisfaction**

Perceived ease of use has a positive and significant impact on satisfaction in e-learning (T-statistic = 5.759 > 1.96, P value = 0.000 < 0.05), supporting H2. This result implies that the more intuitive and user-friendly a platform is, the higher the level of satisfaction experienced by its users. Ease of access and navigation not only enhances the learning experience but also reduces technical barriers that may disrupt the learning process. Therefore, improving perceptions of ease of use serves as a strategic approach to promoting technology adoption while mitigating user resistance to behavioural changes in digital learning (Choe et al., 2021).

Ease of use plays a crucial role in enhancing student satisfaction with e-learning, as supported by various studies (Chiang et al., 2019; Xu et al., 2022). A platform that is easily accessible and navigable allows students to focus more on learning materials without being hindered by technical difficulties. When users feel comfortable operating the system, they are more likely to engage in the learning process and remain motivated to continue using the technology (Sayaf et al., 2021). Additionally, ease of use contributes to increasing students’ confidence in digital learning. When an e-learning system is intuitively designed, students feel more confident in exploring its features, ultimately fostering a more effective and enjoyable learning experience.

According to the Technology Acceptance Model (TAM), the perceived ease of use of an application directly influences its perceived usefulness. If users find an application easy to use, they are more likely to perceive it as beneficial, which, in turn, enhances their overall satisfaction (Hoang & Le Tan, 2023). This ease of use not only improves satisfaction but also supports the sustainability of digital learning practices. The more students become accustomed to and confident in adopting technology in their learning, the more likely they are to integrate it as an essential part of their academic activities. In the long run, seamless access and usability can contribute to the development of a more inclusive and adaptive digital learning ecosystem.

**4.3.3 Effect of Perceived Usefulness on Satisfaction**

Perceived usefulness has a positive and significant impact on satisfaction, indicating that the higher users’ perception of a platform’s usefulness, the greater their level of satisfaction. (T-statistic = 4.782 > 1.96, P value = 0.000 < 0.05). Thus, H3 is supported. Al-Hattami (2021) emphasizes that perceived usefulness directly influences satisfaction, as users tend to evaluate a system or service based on the extent to which it benefits them in achieving their goals. In the context of e-learning, perceived usefulness plays a crucial role in shaping a positive learning experience (Al-Fraihat et al., 2020; Chang & Chen, 2020). Users who find that a learning platform helps them understand materials more easily, enhances learning efficiency, and provides access to relevant resources are more likely to be satisfied with the service.

This finding is supported by previous research by Saqr et al. (2024), which highlights that user satisfaction in technology-based learning environments is significantly influenced by their perception of platform usefulness, ease of navigation, and availability of interactive features. The intention to continue using such technology depends on the extent to which the platform meets user expectations and contributes to a more effective learning experience (Saqr et al., 2024). This approach aligns with the Technology Acceptance Model (TAM), which asserts that perceived usefulness and perceived ease of use are key factors influencing technology acceptance and utilization in education (Han & Sa, 2022). When a system is designed to deliver clear benefits and provide seamless accessibility, user satisfaction and engagement in digital learning increase. Implementing intuitive and functional technology not only encourages user adoption but also enhances overall learning effectiveness.

The majority of Ruangguru users have a high school education or equivalent, a factor that shapes their evaluation of perceived usefulness in determining satisfaction. If an e-learning platform can provide relevant materials, facilitate the understanding of complex concepts, and improve academic performance, user satisfaction is likely to increase. Learners at this educational level often rely on learning applications to support their studies. They tend to be more critical, prioritizing self-directed learning features such as adaptive learning, artificial intelligence (AI), and access to professional mentors. The higher the perception of usefulness, the greater the likelihood that users will experience satisfaction with their learning journey.

**4.3.4 Effect of Perceived Ease of Use on Acceptance Intention**

The findings of this study indicate that perceived ease of use does not have a direct influence on acceptance intention (T-statistic = 0.559 > 1.96, P value = 0.576 < 0.05), indicating that H4 is not supported. Users' perception of ease of use does not necessarily lead to an increase in their acceptance intention. This result aligns with previous studies (Al-Adwan et al., 2023; Alassafi, 2022; Han & Sa, 2022). Within the examined e-learning context, this suggests that while ease of use may enhance user comfort and experience, it is not necessarily a primary determinant in their decision to adopt the technology. One possible explanation is that users may prioritize the tangible benefits derived from the technology over its ease of use. If a system is easy to use but fails to deliver significant improvements in efficiency or effectiveness, users are unlikely to be motivated for long-term adoption.

This finding is consistent with Han and Sa (2022), who found that students’ ease of using online classes does not directly impact their intention to accept such classes. Their study highlights that while perceived ease of use may contribute to other factors, such as perceived usefulness and satisfaction, it is not the primary determinant of acceptance intention in online education. These findings are further supported by Sprenger and Schwaninger (2023), who emphasize that in the face of technological advancements, the most influential factor in acceptance intention is perceived usefulness—the extent to which technology is seen as beneficial and capable of meeting users' needs. Individuals are more likely to adopt technology when they perceive clear added value, such as increased productivity or efficiency, rather than merely finding it easy to use.

Similarly, Alassafi (2022) found that perceived ease of use does not significantly influence the intention to use e-learning. Instead, academic motivation and perceived usefulness have a more substantial impact, suggesting that students prioritize benefits and intrinsic motivation over ease of use. This study reinforces the argument that while perceived ease of use remains an essential component of the Technology Acceptance Model (TAM), its effect can be overshadowed by other factors such as motivation and user context. Likewise, Al-Adwan et al. (2023) discovered that perceived ease of use does not directly influence the intention to adopt metaverse technology but contributes to increasing perceived enjoyment and perceived usefulness, which are key factors shaping users’ adoption intention. While its direct impact may be limited, perceived ease of use still plays a crucial role in fostering technology adoption. Therefore, technology developers should not solely focus on enhancing usability but must also ensure that the technology provides clear and relevant benefits to users. Prioritizing functionality and value-driven features will ultimately enhance user acceptance and long-term engagement with e-learning platforms.

**4.3.5 Effect of Perceived Usefulness on Acceptance Intention**

Perceived usefulness has a positive and significant effect on acceptance intention in the context of e-learning (T-statistic = 2.635 > 1.96, P value = 0.000 < 0.05). Thus, H5 is accepted. The higher the users’ perception of an application’s usefulness, the more likely they are to adopt it. Substantial perceived usefulness makes users feel that the application enhances their understanding and learning effectiveness, thereby motivating them to adopt it. In electronic service sectors, such as e-learning platforms like Ruangguru, the perception of usefulness is a crucial factor influencing users’ acceptance intention (Alkhawaja et al., 2022; To & Trinh, 2021). A user's intention to engage with a system is closely linked to their evaluation of the benefits it offers. Their perception of how well a system helps them achieve their goals or complete specific tasks significantly influences their decision to adopt it (To & Trinh, 2021).

Perceived usefulness is a key component of the Technology Acceptance Model (TAM), including its application in telemedicine services (Kissi et al., 2020). Users’ understanding of the benefits provided, along with the ease of system use, plays a crucial role in determining its effectiveness (Almaiah et al., 2022). When users believe that a digital tool is both beneficial and easy to use, they are more motivated to adopt and continue using it. A strong belief in the system’s usefulness reinforces users' intention to engage with the service, further supported by an intuitive and efficient user experience (Kissi et al., 2020).

**4.3.6 Effect of Satisfaction on Acceptance Intention**

The findings of this study indicate that satisfaction has a positive and significant impact on acceptance intention (T-statistic = 4.296 > 1.96, P value = 0.000 < 0.05); thus, H6 is accepted. The higher the level of user satisfaction with a system, the greater their intention to adopt and integrate it into their activities. This finding aligns with previous research confirming a positive relationship between satisfaction and acceptance intention in various contexts, particularly in e-learning (Kashive et al., 2020; Lin et al., 2021; Mohammed et al., 2022).

In the context of digital learning, students’ satisfaction with the use of information and communication technology (ICT) serves as a primary predictor of their intention to continue using technology to support their learning process (Sayaf et al., 2021). When students perceive that the technology provides a practical and satisfying learning experience, they are more motivated to engage with it on a long-term basis. Additionally, the intention to use e-learning is not solely influenced by user satisfaction but also by their perception of the system’s ease of use and usefulness. If users find an e-learning system easy to navigate and operate with minimal effort, they are more likely to feel satisfied and open to adopting it over the long term (Kashive et al., 2020).

The Technology Acceptance Model (TAM) provides a relevant framework for understanding the factors influencing users' acceptance and adoption of technology (Balakrishnan & Dwivedi, 2024). This model explains that acceptance intention is shaped by various determinants, including perceived ease of use and perceived usefulness (Han & Sa, 2022). Educational institutions play a crucial role in designing technology solutions that align with users’ needs by ensuring both usability and perceived benefits. Optimizing system features and enhancing service quality are key factors in fostering adoption and long-term usage. A user experience-driven approach not only facilitates more effective technological innovations but also strengthens user engagement, ensuring long-term satisfaction and reinforcing acceptance intention in digital education.

4. Conclusion

This study provides in-depth insights into the key factors influencing acceptance intention in e-learning, particularly on the Ruangguru platform. It also explores the role of satisfaction in shaping acceptance intention, utilizing data from 200 respondents as the research sample. The proposed research model focuses on examining the relationships between perceived ease of use, perceived usefulness, and satisfaction in driving acceptance intention within e-learning environments. The findings reveal that perceived ease of use, perceived usefulness, and satisfaction significantly contribute to acceptance intention. Moreover, satisfaction serves as a mediator in the relationship between perceived ease of use and perceived usefulness in influencing acceptance intention. Overall, this study underscores how the integration of technology in digital learning not only enhances accessibility and learning effectiveness but also fosters deeper user engagement with the platform.

Furthermore, the results highlight the impact of perceived ease of use on perceived usefulness (T-statistic = 16.173, P-value = 0.000). These findings align with He et al. (2023), who assert that the ease of use of an e-learning platform enhances users’ perception of its benefits. This result, in turn, increases the platform’s effectiveness and strengthens users’ intention to accept. Given that these two variables are fundamental components of the Technology Acceptance Model (TAM), they play a crucial role in shaping user behaviour toward the Ruangguru e-learning platform.

The findings of this study offer both theoretical and practical implications for stakeholders involved in the development of e-learning services. Theoretically, this research contributes to strengthening the Technology Acceptance Model (TAM) in explaining the intention of modern e-learning users to accept. Additionally, it provides a deeper examination of the relationship between perceived ease of use and perceived usefulness to optimize technology adoption. This concept is particularly relevant in understanding e-learning adoption patterns among Generations Y, Z, and Alpha, who exhibit distinct technological behaviours (Höfrová et al., 2024).

From a practical standpoint, this study benefits students, researchers, and e-learning service providers. Students can use these findings as a reference to understand better the factors influencing technology acceptance in digital learning. For researchers, this study provides empirical evidence and academic insights into the relationships between perceived ease of use, perceived usefulness, and satisfaction, which ultimately impact acceptance intention in the e-learning context. Meanwhile, e-learning providers can leverage these findings to develop marketing strategies and design more effective systems. Digital platforms that are both accessible and provide tangible benefits to users can enhance satisfaction and reinforce their intention to continue using e-learning services (Filieri et al., 2021; Han & Sa, 2022; Sayaf et al., 2021).

This study reveals that perceived ease of use does not directly increase acceptance intention; instead, its effect is mediated by user satisfaction with their experience in using the system. In contrast, perceived usefulness has a more direct influence, as users are more likely to adopt e-learning if they perceive it as beneficial. Therefore, optimizing technological design and features should prioritize enhancing perceived benefits rather than merely improving navigational ease. A deeper understanding of the factors contributing to satisfaction and acceptance intention enables companies to focus on developing features that deliver real value while mitigating barriers that may hinder platform adoption. Furthermore, this study highlights the strong relationship between perceived ease of use and perceived usefulness, as indicated by the highest P-value (P-value = 16.173) in the analysis based on Table 4. This finding suggests that the easier an e-learning system is to use, the greater the perceived benefits for users. Consequently, perceived ease of use plays a crucial role in enhancing perceived usefulness, which in turn contributes to satisfaction and acceptance intention.

These insights provide valuable guidance for e-learning providers in formulating more effective system development strategies. Providers should consider perceived ease of use, perceived usefulness, and satisfaction when designing their platforms. Ensuring that e-learning platforms are intuitive, functional, and aligned with user needs is essential. One key approach is optimizing features that enhance user comfort while delivering informative and relevant educational content. Ultimately, increased satisfaction will strengthen users’ long-term commitment to e-learning platforms, promoting broader and more sustainable adoption.

This study has several limitations that should be considered for future research to enhance the understanding of e-learning contexts. First, the age distribution of respondents is skewed, with 91% falling within the 16–28 age range, limiting the generalizability of the findings to older user groups. Second, the sample is predominantly female (88%), while male respondents account for only 12%, leading to findings that primarily reflect the experiences of female users. Third, the respondents' educational background is concentrated at the high school level (55%), with only 30.5% holding a bachelor's degree and 9.5% having a diploma, making the results more representative of users with a high school education.

Additionally, this study focuses solely on the Ruangguru platform, which restricts the applicability of the findings to other e-learning platforms that may have different features and user demographics. Lastly, the study employs a cross-sectional research design, capturing user behaviour at a single point in time, thereby limiting insights into long-term behavioural changes in e-learning adoption. Future studies should consider a more diverse respondent profile, include multiple e-learning platforms, and adopt a longitudinal approach to gain deeper insights into user behaviour over time.

The adoption of e-learning continues to evolve across various platforms, necessitating further research better to understand users' acceptance intentions toward these services. Future studies could examine user behaviour by comparing experiences across multiple e-learning platforms, providing a more comprehensive understanding of the factors influencing perceived ease of use, perceived usefulness, and satisfaction. Additionally, exploring user behaviour based on demographic factors such as gender, age group, and educational background is crucial for identifying variations in e-learning acceptance. Given that the majority of respondents in this study were female and aged 16–28, future research should include a more diverse age range to achieve more representative findings.

A longitudinal research approach is also recommended to evaluate changes in perceived ease of use and perceived usefulness over time, as well as their impact on satisfaction and acceptance intention. Furthermore, future studies should analyze e-learning features in greater detail to assess their influence on users' decisions to adopt and continue using these platforms. Key aspects such as virtual classroom effectiveness, examination and practice test systems, interactive tutoring, feedback mechanisms, and certification processes should be explored to understand how these features enhance user experience and support the long-term adoption of e-learning.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests or non-financial interests or personal relationships that could have appeared to influence the work reported in this paper..

References

1. Akdim K, Casaló LV, Flavián C. The role of utilitarian and hedonic aspects in the continuance intention to use social mobile apps. J Retail Consum Serv. 2022;66. doi:10.1016/j.jretconser.2021.102888.
2. Al Kurdi B, Alshurideh M, Salloum SA, Obeidat ZM, Al-dweeri RM. An empirical investigation into examination of factors influencing university students' behavior towards e-learning acceptance using SEM approach. Int J Interact Mob Technol (IJIM). 2020;14(02):19. doi:10.3991/ijim.v14i02.11115.
3. Al-Adwan AS, Albelbisi NA, Hujran O, Al-Rahmi WM, Alkhalifah A. Developing a holistic success model for sustainable e-learning: A structural equation modeling approach. Sustainability (Switzerland). 2021;13(16). doi:10.3390/su13169453.
4. Al-Adwan AS, Li N, Al-Adwan A, Abbasi GA, Albelbisi NA, Habibi A. Extending the Technology Acceptance Model (TAM) to predict university students' intentions to use metaverse-based learning platforms. Educ Inf Technol. 2023;28(11):15381-15413. doi:10.1007/s10639-023-11816-3.
5. Alassafi MO. E-learning intention material using TAM: A case study. Mater Today Proc. 2022;61:873-877. doi:10.1016/j.matpr.2021.09.457.
6. Al-Fraihat D, Joy M, Masa’deh R, Sinclair J. Evaluating E-learning systems success: An empirical study. Comput Human Behav. 2020;102:67-86. doi:10.1016/j.chb.2019.08.004.
7. Al-Hattami HM. Determinants of intention to continue usage of online shopping under a pandemic: COVID-19. Cogent Bus Manag. 2021;8(1). doi:10.1080/23311975.2021.1936368.
8. Aljawarneh SA. Reviewing and exploring innovative ubiquitous learning tools in higher education. J Comput High Educ. 2020;32(1):57-73. doi:10.1007/s12528-019-09207-0.
9. Alkhawaja MI, Halim MSA, Abumandil MSS, Al-Adwan AS. System quality and student’s acceptance of the E-learning system: The serial mediation of perceived usefulness and intention to use. Contemp Educ Technol. 2022;14(2). doi:10.30935/CEDTECH/11525.
10. Almaiah MA, Alfaisal R, Salloum SA, Al-Otaibi S, Al Sawafi OS, Al-Maroof RS, Lutfi A, Alrawad M, Mulhem AA, Awad AB. Determinants influencing the continuous intention to use digital technologies in higher education. Electronics (Switzerland). 2022;11(18). doi:10.3390/electronics11182827.
11. Al-Maroof RS, Alhumaid K, Salloum S. The continuous intention to use E-learning, from two different perspectives. Educ Sci. 2020. doi:10.3390/educsci.
12. Almogren AS. Art education lecturers' intention to continue using the blackboard during and after the COVID-19 pandemic: An empirical investigation into the UTAUT and TAM model. Front Psychol. 2022;13. doi:10.3389/fpsyg.2022.944335.
13. AlMulhem A. Investigating the effects of quality factors and organizational factors on university students’ satisfaction of e-learning system quality. Cogent Educ. 2020;7(1). doi:10.1080/2331186X.2020.1787004.
14. Al-Qudah AA, Al-Okaily M, Alqudah G, Ghazlat A. Mobile payment adoption in the time of the COVID-19 pandemic. Electron Commer Res. 2024;24(1):427-451. doi:10.1007/s10660-022-09577-1.
15. Al-Rahmi AM, Shamsuddin A, Alturki U, Aldraiweesh A, Yusof FM, Al-Rahmi WM, Aljeraiwi AA. The influence of information system success and technology acceptance model on social media factors in education. Sustainability. 2021;13(14):7770. doi:10.3390/su13147770.
16. Alturki U, Aldraiweesh A. Application of learning management system (LMS) during the COVID-19 pandemic: A sustainable acceptance model of the expansion technology approach. Sustainability (Switzerland). 2021;13(19). doi:10.3390/su131910991.
17. Alyoussef IY. E-learning acceptance: The role of task–technology fit as sustainability in higher education. Sustainability. 2021;13(11):6450. doi:10.3390/su13116450.
18. Alzahrani L, Seth KP. Factors influencing students’ satisfaction with continuous use of learning management systems during the COVID-19 pandemic: An empirical study. Educ Inf Technol. 2021;26(6):6787-6805. doi:10.1007/s10639-021-10492-5.
19. Baber H. Modelling the acceptance of e-learning during the pandemic of COVID-19-A study of South Korea. Int J Manag Educ. 2021;19(2):100503. doi:10.1016/j.ijme.2021.100503.
20. Bailey D, Almusharraf N, Hatcher R. Finding satisfaction: Intrinsic motivation for synchronous and asynchronous communication in the online language learning context. Educ Inf Technol. 2021;26(3):2563-2583. doi:10.1007/s10639-020-10369-z.
21. Baji F, Azadeh F, Sabaghinejad Z, Zalpour A. Determinants of e-learning acceptance amongst Iranian postgraduate students. J Glob Educ Res. 2022;6(2):181-191. doi:10.5038/2577-509x.6.2.1089.
22. Balakrishnan J, Dwivedi YK. Conversational commerce: Entering the next stage of AI-powered digital assistants. Ann Oper Res. 2024;333(2-3):653-687. doi:10.1007/s10479-021-04049-5.
23. Bhardwaj P, Gupta PK, Panwar H, Siddiqui MK, Morales-Menendez R, Bhaik A. Application of deep learning on student engagement in e-learning environments. Comput Electr Eng. 2021;93:107277. doi:10.1016/j.compeleceng.2021.107277.
24. Casteel A, Bridier N. Describing Populations and Samples in Doctoral Student Research. Int J Dr Stud. 2021;16:339–62. doi:10.28945/4766.
25. Chang IH, Chen RS. The Impact of Perceived Usefulness on Satisfaction with Online Parenting Resources: The Mediating Effects of Liking and Online Interaction. Asia-Pac Educ Res. 2020;29(4):307–17. doi:10.1007/s40299-019-00484-y.
26. Chang Y-W, Chen J. What motivates customers to shop in smart shops? The impacts of smart technology and technology readiness. J Retail Consum Serv. 2021;58:102325. doi:10.1016/j.jretconser.2020.102325.
27. Chawla D, Joshi H. Role of Mediator in Examining the Influence of Antecedents of Mobile Wallet Adoption on Attitude and Intention. Glob Bus Rev. 2023;24(4):609–25. doi:10.1177/0972150920924506.
28. Chen X, You X, Chang V. FinTech and commercial banks’ performance in China: A leap forward or survival of the fittest? Technol Forecast Soc Change. 2021;166:120645. doi:10.1016/j.techfore.2021.120645.
29. Cheung GW, Cooper-Thomas HD, Lau RS, Wang LC. Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. Asia Pac J Manag. 2024;41(2):745–83. doi:10.1007/s10490-023-09871-y.
30. Chiang C-Y, Boakye K, Tang X. The Investigation of E-Learning System Design Quality on Usage Intention. J Comput Inf Syst. 2019;59(3):256–65. doi:10.1080/08874417.2017.1342176.
31. Chin WW. The partial least squares approach to structural equation modelling. 1998;295. doi:10.4324/9781410604385-10.
32. Choe JY, Kim JJ, Hwang J. Innovative marketing strategies for the successful construction of drone food delivery services: Merging TAM with TPB. J Travel Tour Mark. 2021;38(1):16–30. doi:10.1080/10548408.2020.1862023.
33. Chowdhury S, Rodriguez-Espindola O, Dey P, Budhwar P. Blockchain technology adoption for managing risks in operations and supply chain management: evidence from the UK. Ann Oper Res. 2023;327(1):539–74. doi:10.1007/s10479-021-04487-1.
34. CNN Indonesia. Apa Itu Acara Clash of Champions yang Viral di Media Sosial? [Internet]. 2024. Available from: <https://www.cnnindonesia.com/hiburan/20240702121307-220-1116603/apa-itu-acara-clash-of-champions-yang-viral-di-media-sosial>
35. Darda MA, Bhuiyan MAH. A Structural Equation Model (SEM) for the socio-economic impacts of ecotourism development in Malaysia. PLoS One. 2022;17(8):e0273294. doi:10.1371/journal.pone.0273294.
36. Dash G, Paul J. CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. Technol Forecast Soc Change. 2021;173:121092. doi:10.1016/j.techfore.2021.121092.
37. Databoks. Hanya Sedikit Warga RI yang Akses Layanan Pendidikan Online [Internet]. 2022a. Available from: <https://databoks.katadata.co.id/pendidikan/statistik/20a591758c7f9dc/hanya-sedikit-warga-ri-yang-akses-layanan-pendidikan-online>
38. Databoks. Survei: Ruangguru Startup Edukasi Paling Populer di Indonesia [Internet]. 2022b. Available from: <https://databoks.katadata.co.id/teknologi-telekomunikasi/statistik/22a18329c984093/survei-ruangguru-startup-edukasi-paling-populer-di-indonesia>
39. Djeki E, Dégila J, Bondiombouy C, Alhassan MH. E-learning bibliometric analysis from 2015 to 2020. J Comput Educ. 2022;9(4):727–54. doi:10.1007/s40692-021-00218-4.
40. Duy Phuong NN, Luan LT, Van Dong V, Le Nhat Khanh N. Examining customers’ continuance intentions towards e-wallet usage: The emergence of mobile payment acceptance in Vietnam. J Asian Financ Econ Bus. 2020;7(9):505–16. doi:10.13106/JAFEB.2020.VOL7.NO9.505.
41. Elhajjar S, Ouaida F. An analysis of factors affecting mobile banking adoption. Int J Bank Mark. 2020;38(2):352–67. doi:10.1108/IJBM-02-2019-0055.
42. El-Sabagh HA. Adaptive e-learning environment based on learning styles and its impact on development students’ engagement. Int J Educ Technol High Educ. 2021;18(1):53. doi:10.1186/s41239-021-00289-4.
43. Filieri R, Acikgoz F, Ndou V, Dwivedi Y. Is TripAdvisor still relevant? The influence of review credibility, review usefulness, and ease of use on consumers’ continuance intention. Int J Contemp Hosp Manag. 2021;33(1):199–223. doi:10.1108/IJCHM-05-2020-0402.
44. Fülöp MT, Breaz TO, Topor ID, Ionescu CA, Dragolea L-L. Challenges and perceptions of e-learning for educational sustainability in the “new normality era.” Front Psychol. 2023;14. doi:10.3389/fpsyg.2023.1104633.
45. Gautam DK, Gautam PK. Transition to online higher education during COVID-19 pandemic: turmoil and way forward to developing country of South Asia-Nepal. J Res Innov Teach Learn. 2021;14(1):93–111. doi:10.1108/JRIT-10-2020-0051.
46. GoodStats. Indeks Pembangunan TIK Indonesia Kembali Meningkat - GoodStats Data [Internet]. 2024a. Available from: <https://data.goodstats.id/statistic/indeks-pembangunan-tik-indonesia-kembali-meningkat-RnbEG>
47. GoodStats. Ruangguru Dulang Lebih Dari 100 Ribu Subscriber dari Clash of Champions - GoodStats Data [Internet]. 2024b. Available from: <https://data.goodstats.id/statistic/ruangguru-dulang-lebih-dari-100-ribu-subscriber-dari-clash-of-champions-V1vCq>
48. Gupta A, Dhiman N, Yousaf A, Arora N. Social comparison and continuance intention of smart fitness wearables: an extended expectation confirmation theory perspective. Behav Inf Technol. 2021;40(13):1341–55. doi:10.1080/0144929X.2020.1748715.
49. Gurban MA, Almogren AS. Students’ Actual Use of E-Learning in Higher Education During the COVID-19 Pandemic. SAGE Open. 2022;12(2). doi:10.1177/21582440221091250.
50. Hair JF, Black WC, Babin BJ, Anderson RE. MULTIVARIATE DATA ANALYSIS EIGHTH EDITION. [Internet]. 2019. Available from: [www.cengage.com/highered](http://www.cengage.com/highered)
51. Hair JF, Hult GTM, Ringle CM, Sarstedt M, Danks NP, Ray S. Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R. Springer International Publishing; 2021. Available from: <https://doi.org/10.1007/978-3-030-80519-7>
52. Han JH, Sa HJ. Acceptance of and satisfaction with online educational classes through the technology acceptance model (TAM): the COVID-19 situation in Korea. Asia Pac Educ Rev. 2022;23(3):403–15. Available from: <https://doi.org/10.1007/s12564-021-09716-7>
53. He S, Jiang S, Zhu R, Hu X. The influence of educational and emotional support on e-learning acceptance: An integration of social support theory and TAM. Educ Inf Technol. 2023;28(9):11145–65. Available from: <https://doi.org/10.1007/s10639-023-11648-1>
54. Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. J Acad Mark Sci. 2015;43(1):115–35. Available from: <https://doi.org/10.1007/s11747-014-0403-8>
55. Hoang H, Le Tan T. Unveiling digital transformation: Investigating technology adoption in Vietnam’s food delivery industry for enhanced customer experience. Heliyon. 2023;9(9):e19719. Available from: <https://doi.org/10.1016/j.heliyon.2023.e19719>
56. Höfrová A, Balidemaj V, Small MA. A systematic literature review of education for Generation Alpha. Discov Educ. 2024;3(1):125. Available from: <https://doi.org/10.1007/s44217-024-00218-3>
57. Holdack E, Lurie-Stoyanov K, Fromme HF. The role of perceived enjoyment and perceived informativeness in assessing the acceptance of AR wearables. J Retail Consum Serv. 2022;65:102259. Available from: <https://doi.org/10.1016/j.jretconser.2020.102259>
58. Huang C-H. Using PLS-SEM Model to Explore the Influencing Factors of Learning Satisfaction in Blended Learning. Educ Sci. 2021;11(5):249. Available from: <https://doi.org/10.3390/educsci11050249>
59. Humida T, Al Mamun MH, Keikhosrokiani P. Predicting behavioral intention to use e-learning system: A case-study in Begum Rokeya University, Rangpur, Bangladesh. Educ Inf Technol. 2022;27(2):2241–65. Available from: <https://doi.org/10.1007/s10639-021-10707-9>
60. Hunde MK, Demsash AW, Walle AD. Behavioral intention to use e-learning and its associated factors among health science students in Mettu university, southwest Ethiopia: Using modified UTAUT model. Informatics Med Unlocked. 2023;36. doi:10.1016/j.imu.2022.101154.
61. Hussein RS, Mohamed H, Kais A. Antecedents of level of social media use: exploring the mediating effect of usefulness, attitude and satisfaction. J Mark Commun. 2021. doi:10.1080/13527266.2021.1936125.
62. Kashive N, Powale L, Kashive K. Understanding user perception toward artificial intelligence (AI) enabled e-learning. Int J Inf Learn Technol. 2020;38(1):1-19. doi:10.1108/IJILT-05-2020-0090.
63. Khan MJ, Reddy LKV, Khan J, et al. Challenges of E-Learning: Behavioral Intention of Academicians to Use E-Learning during COVID-19 Crisis. J Pers Med. 2023;13(3). doi:10.3390/jpm13030555.
64. Kim L, Pongsakornrungsilp P, Pongsakornrungsilp S, Cattapan T, Nantavisit N. Determinants of perceived e-learning usefulness in higher education: A case of Thailand. Innov Mark. 2022;18(4):86-96. doi:10.21511/im.18(4).2022.08.
65. Kissi J, Dai B, Dogbe CSK, Banahene J, Ernest O. Predictive factors of physicians’ satisfaction with telemedicine services acceptance. Health Informatics J. 2020;26(3):1866-1880. doi:10.1177/1460458219892162.
66. Kolade O, Odumuyiwa V, Abolfathi S, et al. Technology acceptance and readiness of stakeholders for transitioning to a circular plastic economy in Africa. Technol Forecast Soc Change. 2022;183. doi:10.1016/j.techfore.2022.121954.
67. Li R. Modeling the Continuance Intention to Use Automated Writing Evaluation Among Chinese EFL Learners. Sage Open. 2021;11(4). doi:10.1177/21582440211060782.
68. Liao Y-K, Wu W-Y, Le TQ, Phung TTT. The Integration of the Technology Acceptance Model and Value-Based Adoption Model to Study the Adoption of E-Learning: The Moderating Role of e-WOM. Sustainability. 2022;14(2):815. doi:10.3390/su14020815.
69. Liébana-Cabanillas F, Singh N, Kalinic Z, Carvajal-Trujillo E. Examining the determinants of continuance intention to use and the moderating effect of the gender and age of users of NFC mobile payments: a multi-analytical approach. Inf Technol Manag. 2021;22(2):133-161. doi:10.1007/s10799-021-00328-6.
70. Lin C-L, Jin YQ, Zhao Q, Yu S-W, Su Y-S. Factors Influence Students’ Switching Behavior to Online Learning under COVID-19 Pandemic: A Push–Pull–Mooring Model Perspective. Asia-Pac Educ Res. 2021;30(3):229-245. doi:10.1007/s40299-021-00570-0.
71. Liu M, Yu D. Towards intelligent E-learning systems. Educ Inf Technol. 2023;28(7):7845-7876. doi:10.1007/s10639-022-11479-6.
72. Logan RM, Johnson CE, Worsham JW. Development of an e-learning module to facilitate student learning and outcomes. Teach Learn Nurs. 2021;16(2):139-142. doi:10.1016/j.teln.2020.10.007.
73. Maatuk AM, Elberkawi EK, Aljawarneh S, Rashaideh H, Alharbi H. The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. J Comput High Educ. 2022;34(1):21-38. doi:10.1007/s12528-021-09274-2.
74. Neuman WL. Social research methods: qualitative and quantitative approaches. Pearson; 2014.
75. Nguyen HTH, Pham HV, Vu NH, Hoang HT. Factors Influencing Students’ Intention to Use E-learning System: A Case Study Conducted in Vietnam. Int J Emerg Technol Learn. 2020;15(18):165. doi:10.3991/ijet.v15i18.15441.
76. Nikou S, Maslov I. An analysis of students’ perspectives on e-learning participation – the case of COVID-19 pandemic. Int J Inf Learn Technol. 2021;38(3):299-315. doi:10.1108/IJILT-12-2020-0220.
77. Puriwat W, Tripopsakul S. The impact of e-learning quality on student satisfaction and continuance usage intentions during COVID-19. Int J Inf Educ Technol. 2021;11(8):368-374. doi:10.18178/ijiet.2021.11.8.1536.
78. Rasheed F, Wahid A. Learning style detection in E-learning systems using machine learning techniques. Expert Syst Appl. 2021;174:114774. doi:10.1016/j.eswa.2021.114774
79. Raza SA, Qazi W, Khan KA, Salam J. Social Isolation and Acceptance of the Learning Management System (LMS) in the time of COVID-19 Pandemic: An Expansion of the UTAUT Model. J Educ Comput Res. 2021;59(2):183-208. doi:10.1177/0735633120960421.
80. Rizun M, Strzelecki A. Students’ acceptance of the COVID-19 impact on shifting higher education to distance learning in Poland. Int J Environ Res Public Health. 2020;17(18):1-19. doi:10.3390/ijerph17186468.
81. Sae-tae K, Wang Q. Satisfied But No Payment: The Impact of Perceived Value on Continuance Intention and Purchase Intention in Music Streaming Services. Telemat Inform Rep. 2024;100179. doi:10.1016/j.teler.2024.100179.
82. Sharabati A-AA, Al-Haddad S, Al-Khasawneh M, et al. The Impact of TikTok User Satisfaction on Continuous Intention to Use the Application. J Open Innov Technol Mark Complex. 2022;8(3):125. doi:10.3390/joitmc8030125.
83. Shirahada K, Zhang Y. Counterproductive knowledge behavior in volunteer work: perspectives from the theory of planned behavior and well-being theory. J Knowl Manag. 2022;26(11):22-41. doi:10.1108/JKM-08-2021-0612.
84. Silva FA, Shojaei AS, Barbosa B. Chatbot-Based Services: A Study on Customers’ Reuse Intention. J Theor Appl Electron Commer Res. 2023;18(1):457-474. doi:10.3390/jtaer18010024.

APPENDIX

The item scale used to measure the construct of this study was adapted from Han & Sa (2022). The item scale of measurement in this study presented in Table 8.

**Table 8. Item Scale**

|  |  |
| --- | --- |
| **Construct** | **Item** |
| Perceived Ease of Use | PEOU1PEOU2PEOU3PEOU4 | I can clearly understand how to use Ruangguru. I can use Ruangguru proficiently. Learning how to use Ruangguru feels easy. Ruangguru is easy to use. |
| Perceived Usefulness | PU1PU2PU3PU4 | Using Ruangguru allows me to access educational information efficiently.Using Ruangguru enables me to obtain useful and engaging educational information.The educational information obtained through Ruangguru is highly beneficial.Using Ruangguru can help me improve my academic performance. |
| Satisfaction | SAT1SAT2SAT3SAT4 | I am satisfied with my choice of using the Ruangguru. I am satisfied with my experience using the Ruangguru. I am satisfied with the quality of the Ruangguru. I agree with the fees charged for using the Ruangguru. |
| Acceptance Intention | AI1AI2AI3AI4 | I plan to use Ruangguru in the future. I will choose Ruangguru in the future. I will speak positively about Ruangguru to others in the future. I will recommend Ruangguru to others in the future. |