A paper presented at the 18th International Conference on Sustainable Development at the Montclair State University, New Jersey, USA, December 2023.

Determinants of Students' Use of e-Learning Information and Communication Technologies

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OIDA International Journal of Sustainable Development, Ontario International Development Agency, Canada.
ISSN 1923-6654 (print) ISSN 1923-6662 (online) www.oidaijsd.com
Also available at https://www.ssrn.com/index.cfm/en/oida-intl-journal-sustainable-dev/

Abstract: The use of e-learning in teaching and learning has increased and improved students' educational experiences in a time when digitalization is transforming educational landscapes. Understanding students' motivations for using e-learning information and communications technologies (ICTs) is crucial for successful educational technology integration. This study aims to investigate the determinants of students' use of e-learning ICTs. To achieve this goal, UTAUT was employed to identify the constructs that influence students' use of e-learning ICTs. The study used a quantitative research method with a survey of 222 university students who use e-learning ICTs. Confirmatory Factor Analysis (CFA), Cronbach Alpha, and Structural Equation Modelling (SEM) techniques were used to analyze the collected data. Reliability and validity values were acceptable. The result derived from the hypothesis found that effort expectancy did not significantly influence students' use of e-learning ICTs. This might be due to digital literacy background of the students. Conversely, utility expectancy, social influence, and facilitating condition were found to exert significant influence on students' use of e-learning ICTs. The study helps in understanding the factors that inform students use of e-learning ICTs.

Keywords: e-learning ICT; Educational Experiences; Intention; Student; Technology Use.

Introduction

Modern education has undergone tremendous change because of the rapid growth of ICTs, which have brought about cutting-edge tools and platforms that enhance teaching and learning (Alenezi 2023). e-learning ICTs are a broad category of digital tools and platforms, have become a significant force behind educational innovation and change which includes computers, smartphones, digital platforms, online learning platforms, virtual classrooms, multimedia materials, and interactive apps that can transcend geographic borders and offer more flexible and individualized learning experiences (Talpur et al., 2021, Vouglanis and Drigas, 2022). e-learning gives students the chance to interact with educational materials and information via digital platforms, encouraging a learner-centric approach that transcends conventional and geographic constraints (Bandyopadhyay et al., 2021). Technology improves educational accessibility, scheduling flexibility encourages active learning, and nurtures 21st-century skills like digital literacy and critical thinking (Khlaisang and Yoshida 2022). ICTs also encourage active learning by gamifying, simulating, and using interactive assessments, which encourages engagement and deeper knowledge (Fusic, et al., 2020). These technological advancements enable a change from conventional didactic strategies to more learner-centred and interactive ones. ICTs for e-learning give teachers the ability to create lessons that are specific to the needs and preferences of each student (Martzoukou et al., 2023). A better comprehension and the development of critical thinking abilities are fostered via interactive multimedia tools, online group projects, and virtual classrooms (Bilotserkovets et al., 2021). With the help of ICTs, instructors can offer their lessons online, freeing up class time for engaging discussions and problem-solving exercises (Carstens et al., 2021).

The use of ICTs in teaching and learning has altered educational practices in a variety of ways, including the facilitation of personalized and adaptive learning experiences in which students can access resources adapted to their specific needs and pace (Ghory and Ghafory, 2021, Sein-Echaluce et al., 2019). Furthermore, it prepares learners for the digital demands of today's workforce and promotes lifelong learning (Khan et al., 2022). Moreover, e-learning ICTs give educators the tools they need to design dynamic learning environments that cross conventional boundaries and deliver engaging instructional content (Alenezi, 2023). Educators can develop learner-centred environments that

enhance active involvement, critical thinking, and collaborative abilities by embracing e-learning ICTs (Chelawat and Sant 2023, Bremner et al., 2023). It becomes essential for educators to comprehend students' use of e-learning ICTs if they want to create effective online learning environments that meet their requirements and expectations (Ramadhan et al., 2022). Intention to use describes a person's deliberate choice and readiness to employ a specific technology or tool (Davis, 1989, Flavián et al., 2020). The willingness and intention of students to accept these technologies, however, is a key factor in the adoption of e-learning ICTs and is critical in defining their overall learning experiences. A multifaceted approach is necessary to understand the factors that influence students' use of e-learning ICTs. Hence the objective of the study is to explore students' use of e-learning ICTs. By examining these factors within the context of e-learning ICTs, educators and researchers can gain valuable insights into the dynamics that shape students' intentions and ultimately drive the successful implementation of these technologies.

The next section reviews related literature on the potential of the utilization of e-learning ICTs in transforming teaching and learning experiences. Section 3 examines several significant theoretical frameworks that are particularly appropriate to the investigation of students' use of e-learning ICTs. The research methodology is covered in Section 4, and the study's results are covered in Section 5. Section 6 presents the discussion and conclusion to make meaningful findings that can inform educators and stakeholders in determining the future of education in the digital era.

Literature Review

The boundaries between time and space have been broken down by e-learning ICTs, allowing students to access instructional materials from any location at any time (Carstens et al., 2021). This adaptability encourages lifelong learning and broadens educational options for various learners, regardless of location limitations. e-learning ICTs provide the ability to customize learning experiences to meet the needs and preferences of specific learners (Ramadhan et al., 2022). Data-driven insights and adaptive learning algorithms enable educators to give tailored training, boosting student engagement and achievement (Ghory and Ghafory, 2021). The interactive aspect of e-learning ICTs engages learners in active and experiential learning through multimedia features, simulations, and gamification (Saleem et al., 2022). This innovative educational strategy improves comprehension, memory, and critical thinking abilities. ICTs' capacity to improve accessibility and inclusivity in education is one of their main benefits (Adtani et al., 2023). Regardless of their location or physical capabilities, learners can participate in education thanks to online learning platforms and digital resources giving students with different learning preferences and styles the chance to interact with the content in ways that work for them (Khlaisang & Yoshida 2022).

The implementation of e-learning ICTs has the potential to promote fundamental changes in instructional strategies. Moreso, discussion forums, online teams, and in-person interactions supported by e-learning ICTs increase student engagement and information retention (Giray, 2021). As a benefit, e-learning ICTs enable seamless communication and collaboration between students and teachers (Chituc, 2020), it maximizes resource utilization while cutting expenses for infrastructure and traditional materials (Al-Ansi et al., 2021). However, despite e-learning ICTs potential in education, issues that require careful thought must be considered. Concerns about screen time, information overload, and maintaining a balance between technology and face-to-face interactions are some of the technical barriers that can limit opportunities for marginalized and underserved populations and create disparities in access to high-quality education (Burrows et al., 2022; Bozkurt et al., 2020). Since e-learning ICTs are virtual, there are worries that interpersonal relationships and face-to-face interactions would deteriorate (Moran-Suarez, 2022).

For educators to be able to use technology to its greatest potential, training and professional development are essential thereby presents a learning curve for educators (Lim et al., 2020). Also, different levels of digital literacy and the need for pedagogical adaptation must be addressed (Tumwesige, 2010). The importance of balancing chances for social connection with technology-mediated learning cannot be overstated (Kluck et al., 2023). Finally, instructional paradigms are changing in favor of student-centered, interactive, and individualized approaches, made possible by a wide range of digital technologies. Technology has the potential to improve educational results and experiences, but its effective integration depends on a rigorous analysis of its advantages, disadvantages, and ethical implications.

Theoretical Framework

Research frequently draws from a variety of theoretical frameworks to comprehend and evaluate students' use of eL-ICTs. This section examines several significant theoretical frameworks that are particularly appropriate to the investigation of students' use of eL-ICTs.

Technology Acceptance Model (TAM)

The TAM has been used for understanding the factors that influence students' technology usage (Davis, 1989, Racero et al., 2020). TAM highlights the importance of perceived usefulness (PU), perceived ease of use (PEOU), attitudes (ATU), and behavioral intentions in predicting actual technology adoption and use (ASU). When discussing e-learning, PU can be used to describe how students believe that utilizing e-learning tools (such learning management systems or online materials) would enhance their academic performance in general or their access to information (Chai et al., 2022, Davis, 1989). Also, PEOU in e-learning measures how intuitive and simple to use e-learning technologies or platforms are seen by students. It has to do with their assurance that they won't encounter major technological difficulties when adopting these technologies (Chai et al., 2022, Davis, 1989). Moreover, ATU in e-learning reflects how students generally feel about using e-learning tools. A more likely adoption of technology and active engagement in online learning activities are frequently linked to a happy attitude (Venkatesh et al., 2003). The use of BI in e-learning indicates the intents of students to actively interact with e-learning technology, do online tasks, take part in online discussions, and make use of digital learning materials. ASU tracks student use and interaction with e-learning technologies and platforms to access course materials, turn in assignments, participate in virtual classes, and engage in group projects online. The way a system is used reflects how people use technology. TAM often includes external variables that can influence the relationships between the core TAM variables. These external factors can be related to individual characteristics (e.g., age, gender, experience), system characteristics (e.g., system performance, technical support), and social influences (e.g., peer pressure, teacher recommendations). External variables in e-learning may include factors like the quality of technical support provided by the institution, the influence of peers or instructors, and students' prior experience with online learning. TAM can assist researchers in analyzing how students' perceptions on the value and simplicity of these technologies affect their intention to adopt them in their instructional strategies and helps educators and institutions design e-learning systems and strategies that align with students' needs and preferences. Resources (Alfalah, 2023).

Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT has been used to explain and predict technology adoption and usage behavior and provides a comprehensive framework for understanding how students in an e-learning context perceive, accept, and use technology (Venkatesh et al., 2003). It considers not only individual beliefs and intentions but also the impact of social influence, facilitating conditions, and moderators on technology adoption. PE in the context of e-learning refers to students' beliefs of how using technology would improve their academic achievement and enrich their learning experience (Venkatesh et al., 2003). The ease of use (EE) in e-learning refers to how students feel e-learning platforms and applications are easy to use and navigate considering factors like user-friendliness, technological complexity, and the technology's learning curve. The term "social influence" (SI) in the context of e-learning refers to the influence of peers, teachers, and other educational stakeholders on students' decisions to adopt and use e-learning technology. Students may be inspired to participate more actively in online learning through supportive social pressure. Internet connectivity, device access, technical assistance, and training are all examples of resources that fall under the category of FC in e-learning. It depicts whether students are in a situation where they can participate in online learning. BI in e-learning refers to a student's intention to continue using e-learning resources and participate in group projects related to future learning. AU in e-learning evaluates how much a student really uses e-learning platforms, accesses online course materials, communicates with classmates and instructors virtually, and uses technology to finish educational assignments. The moderators in UTAUT can change how the primary UTAUT variables are related to one another. Individual attributes (such as age, gender, and experience) as well as system-related (such as system quality, technical support) and contextual (such as organizational culture, external policies) elements can all function as moderators. related to how students view the utility, usability, peer pressure, and accessibility of e-Learning ICTs. In terms of students' use of e-learning ICTs, the UTAUT is significant and offers a thorough framework for evaluating technology uptake and projecting how it will affect instructional strategies (Hunde et al., 2023). Researchers who use UTAUT can investigate how these factors together affect students' use of e-learning ICTs. This model helps educators and institutions design e-learning environments that promote technology adoption and enhance the overall educational experience.

Self-Determination Theory (SDT)

According to Deci and Ryan's Self-Determination Theory (SDT), intrinsic drive and autonomy play a key part in how people adopt new technologies. It looks at how technology may help students feel competent, autonomous, and connected, which will encourage meaningful engagement and self-directed learning (Ryan and Deci, 2022). The SDT emphasizes the significance of building students' sense of competence and autonomy in their learning journey when considering students' intention to use e-Learning ICTs (Olafsen and Deci, 2020). Educators can create interventions that meet the psychological needs of their students by comprehending the motivational elements that influence students' use of e-Learning ICTs. SDT clarifies the psychological factors influencing how readily students integrate technology in the classroom. As a framework for comprehending how students' motivation, autonomy, and perception of competence affect their choices to adopt and engage with educational technology in e-learning context, the e-learning experience for students can be improved by encouraging autonomy, competence, relatedness, and intrinsic motivation, which can lead to more meaningful and long-lasting technology adoption. To encourage students' intrinsic motivation and technological engagement, educators and institutions can create e-learning environments that adhere to SDT's guiding principles.

Social Cognitive Theory (SCT)

The SCT places a strong emphasis on how social interactions and observational learning affect how people behave. When used in the context of e-learning and technology adoption, SCT enables us to comprehend how students' interpersonal relationships, observations of how others use technology, and self-regulation affect their choices and actions about educational technology. Students' self-efficacy in e-learning refers to their belief in their ability to use technology efficiently for learning. It incorporates their conviction that they can use technology to use e-learning platforms, do online assignments, and accomplish learning goals. An increased readiness to adopt and use instructional technology is related to higher self-efficacy. The idea behind observational learning in e-learning is that by seeing the failures and achievements of their classmates or instructors, students can learn how to use technology for educational purposes. Students' personal adoption and usage of technology can be positively influenced when they observe others using it for learning in productive ways. Students' ability to control their own learning processes and technology use is a key component of self-regulation in e-learning. This include establishing study objectives, planning study sessions, and keeping track of their online course performance. Strong self-control abilities increase a student's likelihood of using technology as a tool to improve their educational experiences. It implies that people gain knowledge by paying attention to other people's experiences and the results of their decisions (Al-Dokhny et al., 2021, Bandura, 1986). SCT can be used to investigate students' use of e-learning ICTs are influenced by their observations of peers, educators, and other role models using the technologies. Educators and institutions can create e-learning environments that promote self-efficacy, offer opportunities for observational learning, create positive outcome expectations, and support students' self-regulation by taking these factors into account within the context of Social Cognitive Theory (SCT). This in turn could increase students' use of technology and involvement in online learning.

This study found some conceptual similarities between certain variables in TAM, SDT, and SCT and UTAUT in the context of understanding technology adoption and use. For instance, the Performance Expectancy and Effort Expectancy of the UTAUT variables might be seen as extensions of the Perceived Usefulness and Perceived Ease of Use of the TAM factors, respectively. Perceived Usefulness in TAM is aligned with Performance Expectancy in UTAUT, which includes both the usefulness of the technology and expectations linked to its performance. Effort Expectancy in UTAUT assesses how easy or difficult utilizing the technology is, like Perceived Ease of Use in TAM. While self-efficacy in SCT primarily relates to a person's perceived capacity to do a behavior, effort expectancy in UTAUT concentrates on the perceived simplicity of using a technology. These are only two examples of the parallels between SCT and UTAUT. These two factors are connected because a person's self-efficacy might affect how easy or difficult, they think it will be to use a certain technology. A lower impression of effort required for technology use may result from higher self-efficacy. Furthermore, SCT emphasizes how people can learn from watching others through observational learning. Social Influence in the context of UTAUT considers external influences, the influence of peers, and the impact of social norms on technology acceptance. These ideas are connected because they both consider how social interactions affect how people behave. When people see others use technology and are influenced by their observations, observational learning can be a part of social influence. Perceived competence in self-determination theory (SDT) pertains to people's views in their capacity to carry out a behavior effectively, whereas performance expectancy in UTAUT evaluates the perceived advantages of adopting a

technology. These notions are interrelated because people's thoughts about whether adopting a technology would produce effective results can be influenced by their perceptions of their own competence. Individuals are more likely to anticipate successful performance outcomes from the usage of a technology if they feel skilled using it.

Hypothesis

UTAUT was chosen as the model for this study because it considers the TAM, SDT, and SCT's logic in its multidimensional nature of technology adoption, making it a suitable alternative to evaluate students' use of e-learning ICTs. This is because the variables of the evaluated theories (TAM, SDT, and SCT) converge on shared characteristics with the variables of UTAUT as previously explained.

Effort expectancy: When discussing e-learning and technology adoption, the level of ease or difficulty that students perceive using ICT for e-learning is referred to as effort expectation (Abbad, 2021, Al-Azawei and Alowar, 2020). It has a big impact on how eager students are to use e-learning ICT. Students are more likely to have favorable intentions to utilize technology if they perceive it is simple to use and requires little effort to navigate (OZKAN et al., 2020). The level of effort that students perceive is influenced by their existing technological proficiency and familiarity with related tools (Alenezi, 2023). Students' perceptions of the amount of effort they should expect to put in can be favorably influenced if they observe their peers utilizing e-learning ICT with ease and does not demand a major investment of time and effort (Osei et al., 2022).

- H_1: Effort expectancy has an influence on students' use of e-learning ICTs.

Utility expectancy

In the context of technology adoption and e-learning, refers to how strongly people believe that adopting e-learning ICT would help them obtain better learning outcomes or improve their performance (Abbad, 2021). It's important to consider when determining how students intend to use ICT for e-learning. Students are more likely to have good intentions to use technology as an educational tool if they believe that doing so will improve their academic achievement (Mohammad-Salehi et al., 2021, Rodriguez et al., 2022). Also, students are more inclined to utilize it if they believe it will help them grasp concepts, recall information, or perform well in examinations. Students may feel that if technology is easy to use and does not require much effort to navigate, it would improve their performance (Wijaya et al., 2022). Depending on the individual and environmental circumstances, its efficacy may change.

- H_2: utility expectance has an influence on students' use of e-learning ICTs.

Social Influence

Students' use of e-learning technologies is significantly shaped by social influence, which includes both social pressure and subjective norms. The validity and worth of e-learning platforms are perceived by students differently by peers, teachers, and institutional support (Venkatesh et al., 2003; Dahri et al., 2023). Students' use of e-learning ICT might be strongly influenced by peers' positive comments and recommendations. Students' great experiences and the advantages they've reaped can inspire others to emulate them. Students may be influenced by the potential of working with their peers and benefiting from shared knowledge and experiences if e-learning ICT includes collaborative learning capabilities (Aliyu et al., 2019). Knowing that peers are available to assist and encourage students in utilizing e-learning ICT helps lower perceived obstacles to adoption, increasing the likelihood that students will utilize it (Alenezi, 2023). Intention can be shaped by perceptions of what is socially anticipated in terms of technology use in an educational setting. Students are more likely to accept e-learning ICT if it becomes the norm for assignments, conversations, or group projects (Osei et al 2022). Peers' and instructors' experiences, recommendations, and actions, as well as social norms within the educational environment, all have a key influence in influencing whether students choose to adopt and incorporate e-learning ICT into their learning practices.

- H_3: Social influence has an influence on students' use of e-learning ICTs.

Facilitating Conditions

Refer to the availability of appropriate tools, infrastructure, and support systems that make it possible and practical for students to use ICT for e-learning in the context of technology adoption and e-learning (Venkatesh et al., 2003; Wijaya et al., 2022). The role of facilitating conditions in shaping students' and educators' intentions to adopt technologies has been a subject of significant research interest (Alfalah, 2023). A wider spectrum of students is encouraged to use e-learning ICT when it is inclusive and supports varied requirements. Digital learning tools including e-books, films, simulations, and interactive modules must be accessible. Students are more likely to intend

to use e-learning ICT when they feel properly equipped and instructed and they perceive that valuable resources are readily accessible (OZKAN et al., 2020). Institutions that provide training sessions, tutorials, or resources on how to use e-learning ICT effectively provide facilitating conditions.

- H_4: Facilitating conditions has an influence on students' use of e-learning ICTs.

Research Methodology

UTAUT offers a thorough and well-established framework that considers the multidimensional nature of technology adoption, making it an appropriate choice for evaluating students' use of e-learning ICTs given the study's purpose. It is highly adapted to the complexity of e-learning situations because it considers technological, social, and individual factors.

Study Design

A cross-sectional study was conducted among university students in South Africa. A confirmatory factor analysis of the measurement tool was performed in the initial stage. In this study, a self-administered questionnaire was utilized to examine students' use of e-learning ICTs. The survey also included questions regarding the demographics of the students and their perceptions of the utility expectations, effort expectations, social influence, and facilitating conditions of utilizing e-learning technology, as well as CFA and SEM. The 21 items of the students' use of e-learning ICTs questionnaire were collected from university students using a convenience sampling technique. Students had to register to access the online survey before they could fill out the questionnaire. After distributing the survey via an internet platform, 222 replies were collected. A Likert scale of 1 to 5 was used to record the replies, where 1 stood for "strongly disagree" and 5 for "strongly agree."

Data Analysis

Shapiro Wilk was utilized to establish whether the data fit the criteria for a normal distribution before data analysis started. The demographic characteristics of the respondents were analyzed and described using frequencies and percentages. CFA and SEM analysis of the data were performed using Jamovi software version 2.3.2. The factorial structure of the student use of e-learning questionnaire was confirmed using confirmatory factor analysis (CFA). For each factor's items to be deemed satisfactory in terms of dependability, Hair et al. (2010) recommended a Cronbach alpha > 0.7 and above. The study computed construct reliability (CR) for convergent validity and average variance extracted (AVE) for discriminant validity after assessing the model's fit criteria to ensure that the results fulfil the basic requirements (Hou et al 2014, Hair et al., 2010). SEM was utilised to determine the validity of each hypothesis after CFA. Additionally, the validity and reliability of the measurement model were examined to make sure that the GOF statistics accurately reflected good overall measurement model fit. The general effectiveness of the GOF model was assessed to determine whether it met the standards established to denote a successful model fit: root mean square error of approximation (RMSEA) > 0.08, Tucker Lewis Index (TLI) > 0.9, comparative fit index (CFI) > 0.9, the goodness-of fit index (GFI) > 0.90, the norm fit index (NFI) > 0.80, and standardized root mean square residual (SRMR) (Hou et al 2014, Hair et al., 2010). In determining the result of the hypothesis, the study accepted a value less than 0.05.

Result

Demographics

In this study, the perceptions are skewed towards the male students who make up most participants (60.8%), who use computers on a regular basis (52.3%) and are between the ages of 23 and 29 (75.7%). This age group is skewed towards the constituents of higher education participants as shown in Table 1. Most participants are enrolled in diploma programs. Future research should aim for a more diverse demographic composition to ensure that findings are generalizable.

Table 1: Respondents Details

Category		n	Percentage
Gender	Male	135	60.8
	Female	87	39.2
Age	16-22	26	11.7
	23-29	168	75.7
	30-36	24	10.8
	37+	4	1.8
Computer Usage	None	22	9.9
	Daily	116	52.3
	Weekly	50	22.5
	Monthly	34	15.3
Degree Program	Diploma	109	49.1
	Honors	57	25.7
	Masters	38	17.1
	PhD	18	8.1

Measurement Model

To evaluate the goodness-of-fit, CFA was used to confirm the factor structure of a collection of observed data. The study's GOF indices include CFI = 0.922, TLI = 0.912, GFI = 0.990, SRMR = 0.055, NFI = 0.950, and RMSEA = 0.0612. The requirements of the various model fit indices should be considered before discussing the model fit of CFA. The CFI value for the study is 0.922, which indicates a good fit given that a CFI value greater than 0.90 is necessary. According to some studies, RMSEA values under 0.05 are favorable, between 0.05 and 0.08 are acceptable, between 0.08 and 0.1 are marginal, and over 0.1 are poor (xx et al., 2023). The sample's RMSEA value of 0.0612 thus indicates a decent fit. The GFI index measures the observed covariance matrix of a sample's data and evaluates how well the proposed model fits the data. The observed covariance matrix was used to calculate the GFI index, which measures how well the suggested model fits the sample's data must have a value of 0.90. The result of the study, 0.990 indicated a robust model fit. The other fit indices that must be greater than 0.9 for a successful fit are NFI and TLI (xx et al., 2023), but in this sample, they are. This sample fits the 5-factor model reasonably well based on these indices. One of the most popular internal consistency estimates, Cronbach's alpha, is shown in Table 2 to help validate the precision of each factor's measurement method. In general, internal consistency is regarded as strong or outstanding if it is between 0.70 and 0.90. All the items in each factor show a strong internal consistency with values greater than 0.830.

Table 2: CFA Output

Factor	Items	Factor Loading	Cronbach's α	CR	AVE
Effort Expectancy	EE1	0.893	0.845	0.922	0.747
	EE2	0.828			
	EE3	0.909			
	EE4	0.824			
Utility Expectancy	UE1	0.911	0.908	0.941	0.80
	UE2	0.902			
	UE3	0.883			
	UE4	0.88			
Social Influence	SI1	0.872	0.833	0.849	0.652

	SI2	0.773			
	SI3	0.774			
Facilitating Conditions	FC1	0.866	0.84	0.839	0.635
	FC2	0.758			
	FC3	0.762			
Behavioral Intention	BI1	0.921	0.909	0.940	0.796
	BI2	0.871			
	BI3	0.866			
	BI4	0.91			

Structural Model

The study examined the structural relationship that exists between measurable variables and latent components using structural equation modelling. A preliminary evaluation of the model's goodness-of-fit revealed that it is a suitable measurement model: CFI is 0.994, TLI is 0.993, GFI is 0.991, NFI is 0.989, RMSEA is 0.076, and SRMR is 0.056. A CFI score greater than 0.90 is necessary to ensure that the model is regarded as indicating good fit. The study's fit score of 0.994 indicates a satisfactory result. The GFI index, which assesses how well the proposed model fits the data, measures the observed covariance matrix of the data from this sample and provides values between 0 and 1. Strong model fit is typically indicated by a score of > 0.995 from this investigation. The study's findings show that the model is suitable because both fit indices, NFI and TLI, must be higher than 0.8 for a decent match. It became possible to assess the path coefficients of the structural model using maximum likelihood (ML) as a parameter. Table 3 shows the results of the hypotheses investigated in the study to identify the interaction between students' use of e-learning ICTs.

Table 3: Structural Model Result

Hypothesis	Dep	Pred	Estimate	SE	β	z	p	Outcome
H1	StuUse	EffExp	-0.0214	0.0790	-0.0180	-0.271	0.787	Rejected
H2	StuUse	UtiExp	0.5061	0.0606	0.5044	8.352	< .001	Accepted
H3	StuUse	SocInf	0.2559	0.0567	0.2245	4.513	< .001	Accepted
H4	StuUse	FacCon	0.1858	0.0551	0.1913	3.371	< .001	Accepted

StuUse = Student Use; EffExp = Effort Expectancy; UtiExp = Utility Expectance; SocInf = Social Influence; FacCon = Facilitating Conditions

- The first hypothesis examined how students' use of e-learning ICTs is influenced by effort expectancy. It was found that effort expectation had no significant influence on students' use of e-learning ICTs, whose β-value of -0.0180 ($p > 0.05$). Therefore, Hypothesis 1 was rejected.

- The second hypothesis examined how students' use of e-learning ICTs is influenced by utility expectations. It was found that utility expectation has a significant influence on students' use of e-learning ICTs, whose β-value of 0.5044 ($p < 0.05$). Therefore, Hypothesis 2 was accepted.

- The third hypothesis examined how students' use of e-learning ICTs is influenced by social influence. It was found that social influence has a significant influence on students' use of e-learning ICTs, whose β-value of 0.2245 ($p < 0.05$). Therefore, Hypothesis 3 was accepted.

- The fourth hypothesis examined how students' use of e-learning ICTs is influenced by facilitating condition. It was found that facilitating condition has a significant influence students' use of e-learning ICTs, whose β-value of 0.1913 ($p < 0.05$). Therefore, Hypothesis 3 was accepted.

Discussion

The primary goal of the study is to identify the factors that influence students' use of e-learning ICTs. Some notable characteristics emerged from the study's participants' demographic profile. Most of the participants were men between the ages of 23 and 29. This age group is often frequently associated with higher education, implying that the study was primarily composed of undergraduate or postgraduate students. Additionally, more than 50 percent of the participants said they regularly use computers. This suggests that a sizable section of the sample had prior technology expertise, which may have influenced their assessment of e-learning ICT. The proposed model fit the CFA reasonably well, according to the analysis done to determine the model's suitability. Further confirming the study's measuring techniques were internal consistency, as determined by Cronbach's alpha, which showed strong reliability for each factor. Examining the relationships between the constructs and the suggested model's fit to the data were the goals of the structural equation modelling (SEM) analysis. Several fit indices, including CFI, TLI, GFI, NFI, RMSEA, and SRMR, showed that the SEM model suited the data well. All these indicators pointed to the structural model as the most suitable choice for analysing the relationships between the variables.

Effort expectancy was found to have no significant influence on students' use of e-learning ICTs. Effort expectancy assesses the perceived ease of use of a technology and its impact on users' intentions to adopt it. While effort expectancy is generally considered important in technology adoption, this finding agrees with the outcome of similar studies. For instance, Huang et al., (2023) analysis of Chinese instructors' intentions to utilize technology revealed that effort expectations had no influence on their intentions. The adoption of Web 2.0 technologies by EFL teachers was examined by Mohammad-Salehi et al., (2021), they found that effort expectations have little influence on BI. The intention to use a digital textbook is unaffected by effort expectation of effort, according to Wijaya et al., (2022) analysis of the factors that may affect mathematics teachers' intentions and actual usage of digital textbooks. Aliyu et al., (2019) discovered that effort expectancy had no significant influence on the acceptance and utilization of the Moodle learning system among business students. This finding may at first seem paradoxical, especially because many students today are "digital natives." Digital natives are typically understood to be people who were immersed in technology from an early age and have grown up in a digital world. They are expected to be familiar with technology and adept at using digital tools. Nevertheless, several factors can help to explain this seemingly counterintuitive outcome such as variations in students' levels of digital literacy and proficiency when using various e-learning ICTs. Also, depending on their prior exposure and experiences, some students may still perceive certain e-learning technologies as difficult or needing extra effort as some tools may greatly in terms of complexity and functionality. Understanding and resolving effort expectation are essential for successful technology integration as technology plays an increasing part in education.

It was found that utility expectations influenced students' use e-learning ICTs. This outcome is consistent with studies that found utility expectancy to be a reliable predictor of student's use of technologies in educational contexts. For example, in their investigation on the technology adoption intents of Chinese instructors, Huang et al., (2023) reports that utility expectancy can help to explain these intentions. According to OZKAN et al., (2020), one of the main predictors of students' behavioural intent to use LMS is utility expectancy. Mohammad-Salehi et al., (2021) provided similar findings that utility expectancy (UE) had favourable and direct influences on behavioural intention (BI) to adopt Web 2.0 technologies while utility expectancy was shown by Rodriguez et al., (2020) to have an impact on behavioural intention to adopt IoT. Since the current generation of students are digital natives, their utility expectations and user experiences are tightly correlated because a good user experience supports their utility expectations. Students are more likely to give utilizing e-learning technology a try and stick with it if they anticipate that it will be user-friendly, fun, and effective. Additionally, when e-learning technology supports students' specific learning objectives, it raises their expectations for its usefulness. For instance, a student is more likely to use an e-learning platform that provides practice activities and coding tutorials if their goal is to enhance their programming abilities. The outcome highlights the significance of how students' perceptions about the benefits of e-learning ICTs impact its usage.

Students' use of e-learning ICTs was found to be significantly influenced by social influence in this study. When students perceive that the necessary resources, support, and infrastructure are in place, they are more likely to embrace and effectively use these technologies for their learning. This demonstrates how important it is for peers, teachers, and social networks to encourage the use of e-learning ICTs. This result is in line with findings from other studies. For example, Zacharis and Nikolopoulou, (2022) investigated the factors influencing university students' behavioural intention to use e-learning platforms and found that social influence has an influence on students' intention to utilize e-learning platforms to learn. Similar findings were obtained in other studies (Aliyu et al., 2019; Al-Mamary, 2020, Al-Azawei and Alowar 2020; Wijaya et al., 2022; Dahri et al., 2023). These illustrate how social

influence consistently comes up as a very important predictor of intention to use technologies in educational contexts. The connected nature of today's youth means that students' social influence gets stronger because they are accustomed to using digital spaces, which give them opportunities to ask for advice, share experiences, and support their peers, enhancing their sense of social influence and belonging. An excellent strategy for educational institutions and instructors to support students' efficient use of e-learning technologies is to recognize and harness the power of social influence.

Students' use of e-learning ICTs was found to be significantly influenced by facilitating conditions. This emphasizes the necessity of providing students with the resources and support mechanisms they need to use technology for learning. This result is in line with what has been reported in previous research. According to OZKAN et al., (2020), facilitating conditions are a significant predictor of students' behavioural intention to use a learning management system while Dahri et al., (2023) reports that facilitating conditions have an impact on teachers' intention to use mobile learning technology and their level of adoption. Furthermore, Gunasinghe and Nanayakkara, (2021) found a favourable correlation between facilitating conditions and Sri Lankan university lecturers' intents to embrace VLEs while Rodriguez et al., (2020) reported that facilitating conditions had an impact on university teachers' behaviour about their intention to adopt the IoT. A crucial aspect of creating facilitating conditions is the availability of technical help and assistance. When utilizing the technology, students should be aware that assistance is available if they run into any difficulties. IT departments, professors, or internet help providers may provide this assistance. Educational institutions and policymakers should give priority to creating the necessary conditions that encourage technology use.

Conclusions

The factors influencing students' use of e-learning ICTs are better understood thanks to this study. Although effort expectancy was not found to be a reliable predictor in this situation, performance expectancy, social influence, and facilitating factors were found to have important influences on students' use of e-learning ICTs. These findings are of great importance to educators as well as institutions working to promote the effective use of ICTs for e-learning. Students' readiness to accept and use technology for their academic endeavours can be increased by fostering positive performance expectations, harnessing social influence, and assuring the presence of enabling conditions. Finally, understanding the intricate interplay of these factors is critical for developing effective methods to encourage the adoption of e-learning ICTs and, eventually, improve educational quality in the digital age. To provide a full understanding of technology adoption in education, future research should be performed to study these dynamics in diverse educational settings.

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