Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Determinants of Satisfaction's students using E-Learning Platform:The Technology Acceptance Model Approach

Chedia Karoui[1]

Abstract

The rapid rise of e-learning, especially in the wake of the COVID-19 pandemic, has made it a crucial tool for maintaining educational continuity. Its effectiveness relies on the interaction between actors, particularly the learner community, whose satisfaction is a key factor in engagement. This study explores the determinants of this satisfaction using the Technology Acceptance Model (TAM), which identifies perceived usefulness and perceived ease of use as major elements of platform acceptance. Through a comprehensive literature review and an empirical survey conducted at a Tunisian university, the findings indicate that perceived ease of use has a stronger influence on learner satisfaction than perceived usefulness. These results provide valuable insights for enhancing e-learning systems and fostering their adoption in diverse educational and professional environments. The study contributes to the growing body of research on e-learning by offering actionable recommendations for improving the design and implementation of e-learning initiatives. These findings offer insights for improving e-learning systems in Tunisian universities and promoting their adoption in various educational and professional contexts.

Keywords: *E-Learning Platform, Technology, Students.*

Introduction

The 27th edition of the World Conference of the International Council for Open and Distance Education (ICDE), organized in October 2017 by Contact North in Toronto, brought together hundreds of professionals and leaders from the education sector from 95 countries, providing a platform to exchange ideas and rethink teaching and learning in the current context.

The number of learners worldwide continues to grow, particularly in Tunisia, where a structured educational system under state supervision has been established to meet this increasing demand. Several Tunisian universities have gradually integrated this system in close collaboration with the Virtual University of Tunis (UVT), created in 2002, to ensure large-scale, degree-granting, and certification-based online education.

On March 24, 2020, by the end of the day, more than 850 million children and young people, representing about half of the world's school population, lost access to their educational institutions due to school and university closures in 102 countries, with partial closures in 11 others. In response to this crisis, UNESCO formed a COVID-19 task force to provide guidance and technical support to governments working to maintain education for temporarily out-of-school students. The organization also held regular virtual meetings with Ministers of Education worldwide to facilitate experience-sharing and assess priority needs. Additionally, UNESCO launched the Global COVID-19 Education Coalition, bringing together multilateral actors and private sector partners such as Microsoft and the Global System for Mobile Communications (GSMA) to support countries in deploying distance learning systems that minimize educational disruptions while maintaining social connections with learners.

In this context, e-learning and online education are perceived as essential tools to ensure educational continuity. However, their effectiveness largely depends on the interaction between different stakeholders. Thus, the central role of the learning community, considered the final element of the system, cannot be overlooked.

[1] Associate Professor in Management. University of Gafsa, Higher Institute of Business Administration, Tunisia, Email: karouic@yahoo.fr

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Assessing learner satisfaction with e-learning platforms represents a crucial lever for enhancing engagement. Therefore, our research problem is as follows:

- What are the key determinants of learner satisfaction?
- How do these factors interact with each other?
- To what extent are they interdependent?

In the first theoretical phase, the literature review will define the key concepts and explore the appropriate methodology to address this issue. Then, an empirical study will be conducted to obtain results that will allow for data analysis and interpretation to confirm or refute the formulated hypotheses. These pre-established hypotheses constitute the anticipated answers to the research problem raised.

Literature Review

The Rise of E-Learning

Distance education has experienced significant growth worldwide, particularly following the COVID-19 pandemic. Indeed, this pandemic greatly accelerated the adoption of e-learning. Lockdown measures and social distancing policies compelled educational institutions, such as universities and campuses, to turn to online learning to ensure the continuity of educational services. This mode of education, although relatively new, has undergone remarkable expansion, transforming traditional learning methods and opening new perspectives in education (Bozkurt & Sharma, 2020). Before the advent of the Internet, distance learning already existed. For instance, Pitman (1840) taught shorthand through correspondence, sending materials to students by mail, who would then return their corrected assignments.

In 1924, the first testing machine allowing students to self-assess was invented. Later, in 1954, B.F. Skinner, a professor at Harvard, developed a teaching machine, revolutionizing assessment methods (Siemens, 2021). In 1960, the emergence of the first Computer-Based Training (CBT) Program was a major milestone in digital education. Initially designed for the University of Illinois, this program quickly spread to numerous schools (Martin & Bolliger, 2018).

During the 1980s, the development of the first Macintosh (MAC) computer enabled individuals to learn independently on specific subjects. By the early 1990s, institutions dedicated to online education, such as CALCampus in 1994, emerged, marking the beginning of fully online higher education (Hodges et al., 2020). At the same time, universities like Virginia Beach began awarding doctoral degrees via email-based courses. The invention of the webcam in the 1990s also played a crucial role in transforming student-teacher relationships by enabling real-time interactions and making distance learning more engaging (Bozkurt & Sharma, 2020). In 1999, the term "e-Learning" was coined, referring to distance learning through Information and Communication Technologies (ICT), allowing students to pursue education remotely via computers.

The increased accessibility of computer hardware and the rise of open-source software in the 2000s contributed to the democratization of e-learning (Siemens, 2021). Furthermore, Massive Open Online Courses (MOOCs) and collaborative platforms redefined learning experiences in universities and businesses. E-learning has also become an essential tool for professional training, particularly in Asia, where more than 40% of the world's top 500 companies use it for employee development (Martin & Bolliger, 2018).

However, it is important to distinguish between distance education and distance training. Distance education allows learners to take courses without requiring the physical presence of a teacher. This mode of learning enables access to initial remote education, professional skills enhancement, general knowledge

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

improvement, or even degree preparation (Bozkurt & Sharma, 2020). Additionally, it can include technical or professional training, especially in the context of continuing education (Martin & Bolliger, 2018).

On the other hand, distance training is characterized by access to educational content via online platforms, available at any time, offering great organizational flexibility. However, this autonomy requires a high level of personal discipline from learners (Hodges et al., 2020). Student-teacher interactions primarily occur through forums, chatrooms, or scheduled group sessions organized by the institution. These training programs can be fully or partially remote. Generally, physical attendance may be required for in-person sessions, particularly when obtaining a degree, where exam participation is mandatory (Siemens, 2021). While the accessibility and geographical flexibility of e-learning have been widely emphasized in the literature (Bao, 2020; Szopiński & Bachnik, 2022; Shahmoradi et al., 2023; Liu et al., 2023), its overall effectiveness remains uncertain. Indeed, the success of e-learning does not solely depend on the availability of technology and infrastructure but largely on students' acceptance of it. If students do not engage with the system, online learning loses its effectiveness.

Thus, it is essential to assess e-learning success through the lens of student acceptance. This can be explained using the Technology Acceptance Model (TAM), which suggests that perceived usefulness (PU) and perceived ease of use (PEOU) are key determinants of individuals' attitudes and behavioral intentions (Mailizar et al., 2021; Szopiński & Bachnik, 2022).

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Davis (1989) to explain why individuals accept or reject information technologies. Davis (1989) identified a set of fundamental variables based on previous research on technology acceptance determinants.

Drawing primarily from the Theory of Reasoned Action (TRA), Davis (1989) highlighted two key factors in technology adoption. First, individuals use information technologies based on their belief that these technologies improve their work performance—this first variable is known as perceived usefulness (PU). Second, even if users recognize a technology's usefulness, they may still assume that it is difficult to use and that work performance depends on the effort required to use it. This leads to the second key variable: perceived ease of use (PEOU).

These two variables are defined as follows:

- *Perceived Usefulness of IT*

Refers to "the degree to which a person believes that using a particular information technology will enhance their job performance" (Davis, 1989). This usefulness depends on:

    - The availability of IT (having sufficient access to complete tasks).
    - The accessibility of IT (the extent to which employees can use the technology).
    - The existence of user support services.

- *Perceived Ease of Use*

"The degree to which a person believes that using a specific system is free of effort" (Davis, 1989). This refers to the extent to which an individual believes that using a technology will be (or will not be) easy and require (or will not require) significant effort. Generally, if a technology is perceived as easy to use, individuals are more likely to adopt it (Davis, 1989).

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Recent studies indicate that TAM remains relevant in emerging technology fields, such as virtual reality, connected devices, and digital payment systems. For example:

- Yin et al. (2022) applied TAM to analyze mobile banking adoption, showing that perceived usefulness and ease of use remain essential predictors of adoption, even in rapidly evolving technological environments.

- Chin and Lin (2021) used TAM to explain health technology adoption, particularly in telemedicine applications during the COVID-19 pandemic.

The model is also used to study new digital and collaborative work dynamics, particularly in remote work environments. Recent research (Lin & Chen, 2022) demonstrates that TAM is effective in analyzing the adoption of platforms like Zoom or Microsoft Teams, where perceptions of usefulness and ease of use strongly influence users' long-term adoption of these tools.

Conceptual Framework

Distance Education in Tunisia: An Educational Revolution in Progress

Before the pandemic, distance education in Tunisia was limited and underdeveloped. However, with the school closures imposed by the global health crisis, the Ministry of Education had to quickly adopt digital solutions to ensure the continuity of education (Ben Ahmed, 2021). This led to the acceleration of the development of technological infrastructures and the establishment of online educational platforms (Kacem, 2020). Several platforms were set up to facilitate distance education. The Ministry of Education launched a national platform for online courses, allowing teachers to upload educational resources and conduct live classes (Saidi, 2020). Tools such as Microsoft Teams, Google Classroom, and Zoom were also widely adopted by schools and universities (Zidi, 2021). Distance education offers numerous benefits (Gharbi, 2020):

- Flexibility: Students can follow courses at their own pace, which is particularly beneficial for those with part-time jobs or family responsibilities.

- Accessibility: Online educational resources are accessible from anywhere, provided there is an internet connection, which can reduce regional disparities in access to education.

- Technological Adaptation: Students develop essential digital skills by regularly using modern technologies. Despite its advantages, distance education in Tunisia faces several challenges:

- Internet Infrastructure: The quality and availability of the internet remain uneven across the country, especially in rural areas.

- Digital Skills: Not all teachers and students possess the necessary skills to effectively use digital tools.

- Student Engagement: Maintaining student engagement and motivation can be difficult without in-person interaction.

Conceptual Model and Research Hypotheses

The conceptual model of this study extends the TAM (Technology Acceptance Model) to identify the factors influencing the intention to use e-learning in Tunisia. The factors extracted from the TAM model include motivation, self-image, information quality, and computer literacy, which influence perceived ease of use (PEOU) and perceived usefulness (PU). Additionally, this study adopts satisfaction as an independent variable influencing e-learning.

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Motivation

Promotion in the workplace is a determining factor for students' motivation. Rivard (1988) highlights user motivation, noting that it is the only dimension reconsidered in the four studies used to assess user satisfaction with IT. Motivation plays a considerable and imminent role when it comes to technologies supporting daily tasks (Hadoussa, 2009). Students pursuing e-learning believe it will improve their performance since e-learning develops their professional skills and makes work easier, as it is a new training method. Poçan et al. (2023) argue that the integration of technologies, including mobile technologies, can significantly impact student engagement and academic performance.

H1: "Motivation has a positive impact on the perceived usefulness of e-learning."

Self-Image

Rogers (1995) developed a categorization of innovation adopters, which has become a reference in the literature on the diffusion of innovations. He classifies potential users according to their "receptivity to innovation" or individual propensity for change. Rogers (1995) defines "receptivity to innovation" as the speed with which a person adopts a new product compared to others in their social system. The receptivity of organizational members to changes has been shown to be a determining cause of the success of innovations (Leonard-Barton & Deschamps, 1988; Zmud, 1984).

It has been demonstrated that in a given population, some people are more willing than others to try new "things" and will therefore adopt a change ahead of their peers. Thus, students participating in e-learning are convinced that this new method of learning through ICT is professionally rewarding. Users who are highly innovative in the field of information technology will show more positive beliefs toward mobile technologies. This reasoning aligns with the TAM, which assumes that students' internal beliefs (in terms of perceived usefulness and ease of use) fully modulate their behaviors. For example, a bibliometric analysis by Swati et al. (2022) examined the evolution and expansion of TAM research over the past 30 years, highlighting its application in various fields, including mobile technologies. Consequently, students believe that e-learning allows them to have a good image in their surroundings and improves the way they are perceived.

H2: "Self-image has a positive impact on the perceived usefulness of e-learning."

Information Quality

Information quality is a dimension that determines students' beliefs and perceptions (Jennex et al., 1998; Elias, 2011). Berondor (2023) notes that "information has no intrinsic value; its value comes from the influence it can have on physical events" (p. 1). Quality cannot be objectively or absolutely evaluated (Hadoussa, 2009). It is regularly measured from the user's perspective and is generally subjective. A general framework has been drawn to assess the quality of information. In fact, the ambiguity of information is what determines whether or not the tool will be used.

Therefore, information quality appears to be a determining measure for ease of use (Delone & McLean, 2003; Kositanurit et al., 2011). As a result, it is a crucial dimension of user satisfaction (Sri Rahayu et al., 2022). Being the raw material for organizational decisions, information is the most important product of e-learning. The quality of the information presented on the platform allows students to easily follow the platform's instructions and quickly and easily find various courses to study and locate published messages (Compeau & Higgins, 1995; Sri Rahayu et al., 2022; Berondor G, 2023).

H3: "Information quality has a positive impact on the perceived ease of use of e-learning."

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Computer Literacy

Computer literacy is a key element of e-learning satisfaction. For information systems in general, the concept of mastery of information technologies mainly refers to their functionalities. This means that it refers to the degree to which an information system has the functions for which it should be used. For communication technologies in particular, this concept refers to the degree to which these technologies meet criteria that make them useful to the user for communication (media richness, technological richness, social presence, etc.) (Karoui C., 2024). These characteristics concern the technological factors that impact the perceived success of e-learning. They measure external stimuli as perceived by students. This variable refers to the content of the platform, the content of the hierarchical framework, and the sentiment regarding e-learning.
Therefore, the success of e-learning is determined by the students' relationship with ICT.
H4: "Computer literacy has a positive impact on the perceived ease of use of e-learning."

Perceived Usefulness

Perceived usefulness refers to the degree to which a person believes that using an information technology can help in their work and improve their performance. The factors considered for our model are self-image and motivation.

This variable refers to the relationships students have with e-learning and the benefits they can gain both in terms of learning and performance resulting from e-learning. These gains translate into the acquisition of new knowledge, enabling faster work completion. Students view e-learning as a means to achieve better professional status. Indeed, Berondor G (2023) showed that e-learning facilitates access to training for employees, enabling them to manage their knowledge and follow training better suited to their personal needs. This flexibility contributes to acquiring new skills and improving professional performance.

H5: "The perceived usefulness of e-learning has a positive impact on student satisfaction."

Ease of Use

Ease of use refers to how easily the user has learned to use the tool and their experience with it. It is a determining factor of satisfaction based on the perceived usefulness of e-learning. According to Davis (1989), ease of use refers to "the degree to which a person believes that using a specific system will be free of effort." In fact, the perception of ease of use refers to the degree to which a person believes that using a technology will (or will not) be easy and will (or will not) require much effort from them. In principle, when we perceive a technology as easy to use, we are also more likely to use it.

Ease of use is sometimes confused with personal effectiveness. In fact, even if some students do not have sufficient knowledge in using a tool, they have confidence in their personal abilities to use it. The usable concept is another aspect of ease of use, and the factors defining difficulty of use seem to be a barrier to the efficient and effective use of e-learning. As Yin and Lin (2022) point out, perceived ease of use (PEOU) plays a fundamental role in the success of e-learning by acting as a key factor influencing acceptance, engagement, and user satisfaction with online educational platforms.

This variable refers to students' judgments about the efforts made by platform administrators to support and assist students in accessing the platform. It also refers to students' skills and their relationship with information technologies, and consequently, e-learning tools.

H6: "Perceived ease of use of e-learning has a positive impact on student satisfaction."

Satisfaction

Satisfaction can be defined as "a sense of well-being, a pleasure that results from the accomplishment of what one considers desirable" (Le Robert Dictionary). In the field of information systems, it measures "a

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

sum of feelings and attitudes of users of a support technology related to the characteristics of the information and the involvement of users" (Bailey and Pearson, 1983). According to Crozier and Friedberg (1977), attitude refers to "the relatively permanent normative orientations of individuals toward certain privileged social objects." Attitude is thus built from judgments and opinions gathered from users. In this sense, it is a measure that can be carried out based on attitude variables. Thus, Rivard and Huff (1985) consider that a user's attitude is a determining variable for satisfaction.

User satisfaction is an important concept for explaining the success of e-learning. Indeed, Baroudi, Olson, and Ives (1986) show that user satisfaction is characterized by favorable attitudes toward the information system, while its use is assimilated to behavior. They use the work of Fishbein and Ajzen (1975), which addresses the relationship between attitudes and behaviors, to suggest that attitudes influence intentions, and thus behavior toward an object. Satisfaction is therefore a perceptual and subjective measure of the success of e-learning. It measures how users perceive the system they are using, rather than its technical qualities. Moreover, a literature review by Achhibat and Lebzar (2024) examined the influence of e-learning on higher education performance. This study emphasizes that e-learning offers greater flexibility, accessibility, and personalized learning experiences, which contribute to student satisfaction. However, it also notes challenges such as the digital divide and a potential lack of motivation and engagement.

Conceptual Model and Hypotheses

After defining the various variables used to evaluate e-learning, we will present the conceptual model of our research along with a summary of the hypotheses.

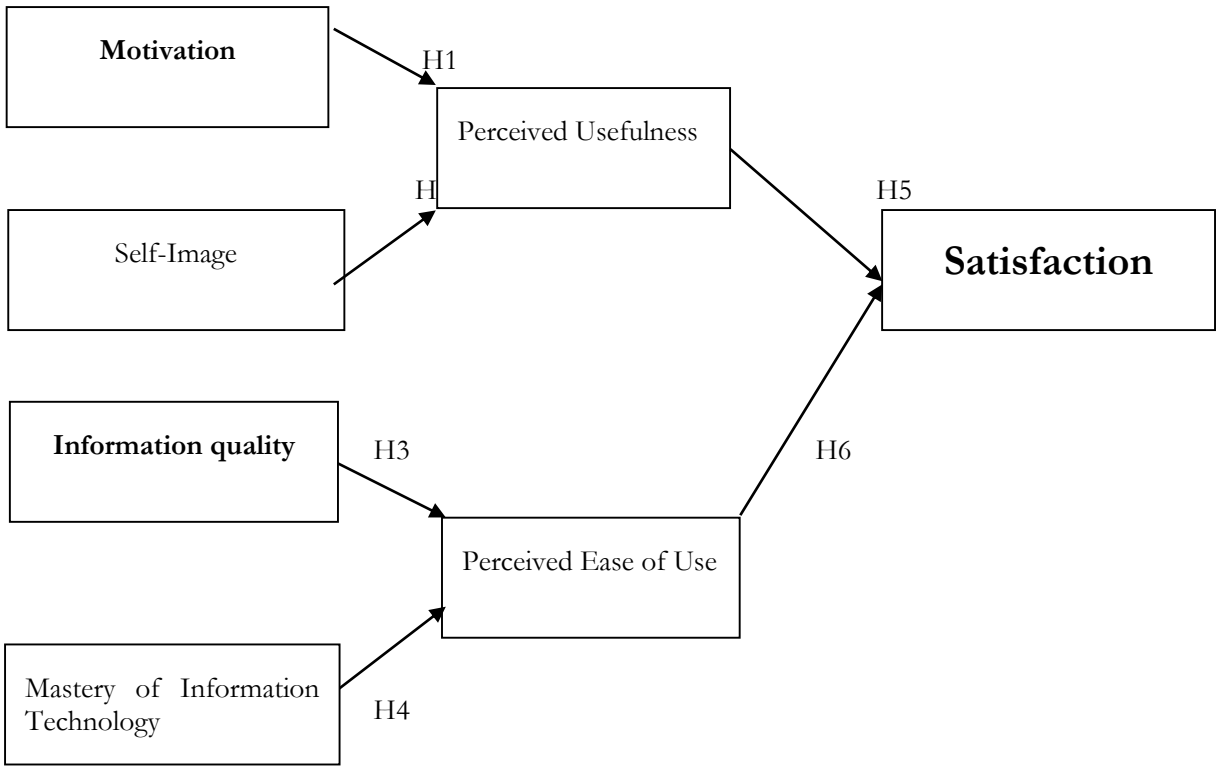

Figure. Conceptual Model

Research Design

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Measurement of Variables

The variables included in our model are measured using items derived from previous research, particularly the work of Akermi et al. (2006) and Hadoussa (2009), and adapted to our research problem, or by items created specifically for the purposes of our study. All variables were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Validation of Measurement Instruments:

Information Quality

This variable is measured by four questions, namely the difficulty of understanding the platform's instructions, the difficulty of finding information on the platform, the difficulty of following the course progress, and the difficulty of locating the published messages.

Table 1. Correlation Matrix of the "Information Quality" Construct

		Difficulty understanding the instructions	Difficulty finding the information	Too many messages about difficulty following the course progress	Frequently losing track of the location of posts
Correlation	Difficulty understanding the instructions	1,000	0,549	0,303	0,435
	Difficulty finding the information	0,549	1,000	0,256	0,426
	Too many messages about difficulty following the course progress	0,303	0,256	1,000	0,404
	Frequently losing track of the location of posts	0,435	0,426	0,404	1,000

Factor analysis allowed us to extract a factorial axis with an eigenvalue greater than 1, specifically 2.194. This factor alone accounts for 54.848% of the initial information. The examination of the factorial contributions, with values greater than 0.6, confirms the unidimensional structure. The quality of item representation is also satisfactory, with communalities greater than 0.4.

According to this matrix, we can observe that the difficulty in understanding the instructions is strongly linked to problems with information search. This may indicate a need to improve the clarity and organization of the instructions. Furthermore, those who struggle to follow the course progress are often the ones who lose track of the location of posts, which could point to an issue with organization or the user interface. Lastly, although the message overload is an issue, it appears to be less directly correlated with the other difficulties.

Table 2. Factor Analysis of "Information Quality"

	Perpresentation quality Communality	Information quality Metrics component
Difficulty understanding the instructions	0.626	0,791
Difficulty finding the information	0.592	0,770
Too many messages about the difficulty following the course progress	0.380	0,617

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Frequently losing track of the location of posts	0.595	0,771
Eigenvalue	2,194	
% of variance explained	54.848	
Cronbach's α	0.720	

The analysis of this table highlights that the majority of variables are well explained by the factor "Information Quality", except for the variable "Too many messages," which is less well represented (communality of 0.380). The component matrix shows that the variables most strongly related to this factor are "Difficulty understanding instructions" (0.791) and "Losing the location of posts" (0.771), while "Too many messages" (0.617) has a weaker, though still significant, association.

The eigenvalue of 2.194 and the explained variance percentage (54.85%) indicate that more than half of the variations in difficulties encountered can be attributed to this single factor. Finally, Cronbach's alpha of 0.720 confirms an acceptable internal consistency, showing that the variables effectively measure a common concept related to information quality.

4.2.2. Mastery of Digital Tools:

This variable is measured using six questions related to the platform's content, the hierarchical framework's content, feedback, user connections, and course content. Before conducting an exploratory factor analysis, we must first ensure that the data are factorable.

Table 3. Correlation Matrix of the Construct "Mastery of Digital Tools"

		Ease of understanding the content	Ease of following the hierarchical framework	Feedback can help understand the content	Connection between users is interactive	Feel comfortable using e-learning
Correlation	Ease of understanding the content	1,000	,620	,343	,247	,411
	Ease of following the hierarchical framework	,620	1,000	,388	,298	,348
	Feedback helps in understanding the content	,343	,388	1,000	,247	,377
	User interaction is engaging	,247	,298	,247	1,000	,363
	Course content is designed according to the student's level	,411	,348	,377	,363	1,000

According to the correlation matrix, we observe that, with significance thresholds, all correlations are positive and mostly significant, except for item 4, "In general, the connection between users is interactive." Its correlation is 0.247, so we need to remove this item. We remove item 4 and rerun the factor analysis. All correlations are positive and significant. The Bartlett's sphericity test and the KMO test (KMO = 0.707) allow for factor analysis.

Table 4. Correlation Matrix of the Construct "Mastery of Digital Tools"

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

		Ease of understanding the content	Ease of following the hierarchical framework	Feedback can help understand the content	Feel comfortable using e-learning
Correlation	Ease of understanding the content	1,000	,620	,343	,411
	Ease of following the hierarchical framework	,620	1,000	,388	,348
	Feedback helps in understanding the content	,343	,388	1,000	,377
	Course content is designed according to the student's level	,411	,348	,377	1,000

We then performed a Principal Component Analysis (PCA) based on the 4 items of the construct. After VARIMAX rotation, this factor analysis revealed a single factor (with an eigenvalue greater than 1) explaining **56.331%** of the total variance. All factorization conditions are met, so we can proceed with our factor analysis.

Table 5. Factor Analysis of the Construct "Mastery of Digital Tools"

	Quality of Representation – Communality	Mastery of Digital Tools per Component Matrix
Ease of understanding the content	0.663	0,814
Ease of following the hierarchical framework	0.652	0,807
Feedback helps in understanding the content	0.452	0,672
Course content is designed according to the student's level	0.487	0,698
Eigenvalue	2. 254	
% of variance explained	56.345	
Cronbach's α	0.737	

The analysis reveals that most variables are well explained by the factor "Mastery of Digital Tools," with high communalities for "Ease of understanding the content" (0.663) and "Ease of following the hierarchical framework" (0.652), indicating strong representation. However, "Feedback can help understand the content" (0.452) and "Course content designed according to the student's level" (0.487) are less well explained, though still significant.

The component matrix shows that the strongest relationships with the factor are observed for content understanding (0.814) and information structuring (0.807), while feedback (0.672) and content adequacy to student level (0.698) are slightly less correlated. The eigenvalue of 2.254 and an explained variance percentage of 56.345% indicate that more than half of the observed variations are attributable to this single factor. Finally, Cronbach's alpha of 0.737 confirms an acceptable internal consistency, suggesting that the variables effectively measure a common concept related to digital tool mastery.

Motivation

This variable is measured using four questions:

- E-learning facilitates career advancement

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

- E-learning enhances my professional skills
- E-learning improves my work execution efficiency
- E-learning increases my chances of performance

Table 6. Correlation Matrix of the Construct "Motivation"

		E-learning facilitates course understanding	E-learning develops my skills and mastery of digital tools	CV enhancement through e-learning	E-learning increases my chances of recruitment
Correlation	E-learning facilitates course understanding	1,000	0,487	0,396	0,454
	E-learning develops my skills and mastery of digital tools	0,487	1,000	0,694	0,598
	CV enhancement through e-learning	0,396	0,694	1,000	0,690
	E-learning increases my chances of recruitment	0,454	0,598	0,690	1,000

According to the correlation matrix, we observe that, with significance thresholds, all correlations are positive and mostly significant.

Bartlett's sphericity test allows us to safely reject the null hypothesis that all correlation coefficients are simultaneously equal to zero. The KMO test, with a value greater than 0.7 (KMO = 0.767), provides a satisfactory result. Finally, the diagonal of the anti-image correlation matrix shows MSA indices greater than 0.5 (ranging between 0.718 and 0.838).

Table 7. Factor Analysis of the Construct "Motivation"

	Quality of Representation – Communality	Motivation – Metrix per component
E-learning facilitates course understanding	0,471	0,686
E-learning develops my skills and mastery of digital tools	0,733	0,856
CV enhancement through e-learning	0,753	0,868
E-learning increases my chances of recruitment	0,720	0,849
Eigenvalue	2,678	
% of variance explained	66,939	
Cronbach's α	0,833	

The analysis shows that the "Motivation" factor explains a large portion of the response variations, with an eigenvalue of 2.678 and an explained variance percentage of 66.939%, indicating strong representativity of the variables. The communalities reveal that the items "CV enhancement through e-learning" (0.753) and "E-learning increases my chances of recruitment" (0.720) are the best represented, while "E-learning facilitates course understanding" (0.471) slightly less accounted for. The component matrix shows that the

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

elements most strongly linked to motivation are CV enhancement (0.868) and increased recruitment chances (0.849), followed by the development of digital skills (0.856).

Finally, Cronbach's alpha of 0.833 indicates excellent internal consistency, confirming that the variables effectively measure a common concept related to learners' motivation through e-learning.

Self-Image

This variable is measured using four questions:

- E-learning improves how I am perceived
- E-learning allows me to have a better self-image
- More prestige at university compared to other students
- Using e-learning is academically rewarding

Table 8. Correlation Matrix of the Construct "Self-Image"

		E-learning improves how I am perceived	E-learning allows me to have a better self-image	More prestige at university compared to other students	Using e-learning is academically rewarding
Correlation	E-learning improves how I am perceived	1,000	0,638	0,350	0,520
	E-learning allows me to have a better self-image	0,494	1,000	0,470	0,479
	More prestige at university compared to other students	0,350	0,447	1,000	0,466
	Using e-learning is academically rewarding	0,520	0,479	0,466	1,000

We begin the study of scale dimensionality by verifying the factorization conditions. The calculation of the correlation matrix, with significance thresholds, shows that all correlations are positive and significant.

Bartlett's sphericity test allows us to safely reject the null hypothesis that all correlation coefficients are simultaneously equal to zero. The KMO test, with a value greater than 0.6 (KMO = 0.735), provides a satisfactory result. Finally, the diagonal of the anti-image correlation matrix shows MSA indices greater than 0.5 (ranging between 0.698 and 0.778).

Since all conditions are met, the data are factorizable.

Table 9. Factor Analysis of the Construct "Self-Image"

	Quality of Representation – Communality	Self-Image Metrix per component
E-learning improves how I am perceived	0,660	0,812
E-learning allows me to have a better self-image	0,687	0,829

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

More prestige at university compared to other students	0,491	0,701
Using e-learning is academically rewarding	0,618	0,786
Eigenvalue	2,457	
% of variance explained	61,414	
Cronbach's α	0,789	

The analysis highlights that the "Self-Image" factor explains a significant portion of response variations, with an eigenvalue of 2.457 and an explained variance percentage of 61.414%, indicating a good representation of the variables.

The communalities show that the items "E-learning allows me to have a better self-image" (0.687) and "E-learning improves how I am perceived" (0.660) are the best represented, while "More prestige at university compared to other students" (0.491) is slightly less accounted for. The component matrix confirms that the elements most strongly linked to self-image are improvement in perception by others (0.812) and enhancement of personal image (0.829), followed by academic recognition (0.786).

Finally, Cronbach's alpha of 0.789 indicates good internal consistency, confirming that these variables effectively measure a common concept related to the impact of e-learning on learners' self-image.

Perceived Ease of Use

This variable is measured using four questions:

- The platform operates consistently
- Ease of learning to use e-learning tools
- My connections with e-learning are clear and understandable
- Ease of becoming competent in using e-learning tools

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Table 10. Correlation Matrix of the Construct "Perceived Ease of Use"

		The platform operates consistently	Ease of learning to use e-learning tools	My connections with e-learning are clear and understandable	Ease of becoming competent in using e-learning tools
Correlation	The platform operates consistently	1,000	0,346	0,376	0,288
	Ease of learning to use e-learning tools	0,346	1,000	0,606	0,696
	My connections with e-learning are clear and understandable	0,376	0,606	1,000	0,675
	Ease of becoming competent in using e-learning tools	0,288	0,696	0,675	1,000

Based on Bartlett's sphericity test, we can safely reject the null hypothesis that all correlation coefficients are simultaneously equal to zero. The KMO test produces a coefficient of 0.751, which is considered a satisfactory result for conducting factor analysis. Additionally, the anti-image correlation matrix shows MSA indices greater than 0.5 (ranging between 0.703 and 0.828). Since all factorization conditions are met, we can proceed with our factor analysis.

Table 11. Factor Analysis of the Construct "Perceived Ease of Use"

	Quality of Representation – Communality	Perceived Ease of Use Metrix per component
The platform operates consistently	0,319	0,564
Ease of learning to use e-learning tools	0,734	0,856
My connections with e-learning are clear and understandable	0,733	0,856
Ease of becoming competent in using e-learning tools	0,754	0,868
Eigenvalue	2,539	
% of variance explained	63,477	
Cronbach's α	0,805	

The analysis indicates that the factor "Perceived Ease of Use" explains a significant portion of the response variations, with an eigenvalue of 2.539 and an explained variance percentage of 63.477%, suggesting strong representativity of the variables.

The communalities show that the items "Ease of becoming competent in using e-learning tools" (0.754) and "Ease of learning to use e-learning tools" (0.734) are the best explained by this factor, while "Platform operates regularly without interruption" (0.319) is less well represented. The component matrix reveals that the elements most strongly linked to perceived ease of use are competence in using the tools (0.868) and clarity of connections with e-learning (0.856), followed by ease of learning the tools (0.856).

Finally, Cronbach's alpha of 0.805 indicates good internal consistency, confirming that these variables effectively measure a common concept related to the perception of the ease of using e-learning.

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Perceived Usefulness

This variable is measured using four questions:

- Using e-learning increases course assimilation
- Using e-learning can improve academic performance
- Using e-learning can introduce and familiarize users with online video conferencing
- Using e-learning is useful for studies

Table 12. Correlation Matrix of the Construct "Perceived Usefulness"

		Using e-learning increases course assimilation	Using e-learning can improve academic performance	Using e-learning can introduce and familiarize users with online video conferencing	Using e-learning is useful for studies
Correlation	Using e-learning increases course assimilation	1,000	0,587	0,457	0,525
	Using e-learning can improve academic performance	0,587	1,000	0,646	0,616
	Using e-learning can introduce and familiarize users with online video conferencing	0,457	0,646	1,000	0,585
	Using e-learning is useful for studies	0,525	0,616	0,585	1,000

According to the correlation matrix, we observe that, with significance thresholds, all correlations are positive and mostly significant. Both Bartlett's sphericity test and the KMO test provide satisfactory results. Additionally, the diagonal of the anti-image correlation matrix shows MSA indices greater than 0.5 (ranging between 0.764 and 0.830).

Since all factorization conditions are met, we can proceed with our factor analysis.

Table 13. Factor Analysis of the Construct "Perceived Usefulness"

	Quality of Representation – Communality	Perceived Usefulness Metrix per component
Using e-learning increases course assimilation	0,595	0,771
Using e-learning can improve academic performance	0,760	0,872
Using e-learning can introduce and familiarize users with online video conferencing	0,670	0,818
Using e-learning is useful for studies	0,688	0,830
Eigenvalue	2,713	
% of variance explained	67,814	
Cronbach's α	0,842	

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

This table presents the results of an exploratory factor analysis (EFA) concerning the perception of the usefulness of e-learning. The communalities, which indicate the proportion of variance explained by each item, range from 0.595 to 0.760, showing that the items are well represented by the underlying factor.

The component matrix reveals that e-learning is perceived as an effective tool for accomplishing tasks more quickly (0.771), improving work performance (0.872), increasing productivity (0.818), and being useful for studies (0.830).

The extracted factor explains 67.814% of the total variance, indicating a strong coherence between the items. Finally, Cronbach's alpha of 0.842 confirms excellent internal reliability of the scale, suggesting that the items reliably and consistently measure the construct of the perceived usefulness of e-learning.

4.2.5. Satisfaction Degree

This variable is measured using four questions:

- Satisfaction with the organization of group sessions
- Satisfaction with the pedagogy of in-person tutors
- Satisfaction with the training content
- Satisfaction with the platform

Table 14. Correlation Matrix of the Construct "Degree of Satisfaction"

		Satisfaction with the organization of group sessions	Satisfaction with the pedagogy of in-person tutors	Satisfaction with the training content	Satisfaction with the platform
Correlation	Satisfaction with the organization of group sessions	1,000	0,679	0,647	0,492
	Satisfaction with the pedagogy of in-person tutors	0,679	1,000	0,641	0,577
	Satisfaction with the training content	0,647	0,641	1,000	0,618
	Satisfaction with the platform	0,492	0,577	0,618	1,000

We then conducted a principal component analysis (PCA) using the 4 items of the construct. The Bartlett's test of sphericity allows us to safely reject the null hypothesis of simultaneous nullity of all correlation coefficients. The KMO test, with a value greater than 0.7 (KMO = 0.805), yields a satisfactory result. Finally, the diagonal of the anti-image correlation matrix shows MSA values greater than 0.5 (MSA ranging from 0.791 to 0.831). All the factorization conditions are met, so we can proceed with our factor analysis.

After VARIMAX rotation, this factor analysis revealed a single factor (with an eigenvalue of 2.844, significantly higher than 1, explaining 71.089% of the total variance). Thus, we proceed with our factor analysis.

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Table 15. Factorial Analysis of the "Degree of Satisfaction" Construct

	Quality of Representation – Communality	Degree of satisfaction Metrix per component
Satisfaction with the organization of group sessions	0,711	0,843
Satisfaction with the pedagogy of in-person tutors	0,750	0,866
Satisfaction with the training content	0,750	0,866
Satisfaction with the platform	0,632	0,795
Eigenvalue	2,844	
% of variance explained	71,089	
Cronbach's α	0.864	

This table presents the results of an exploratory factor analysis (EFA) concerning the participants' degree of satisfaction in a training program. The communalities, which reflect the proportion of variance explained by each item, range from 0.632 to 0.750, indicating that the items are well represented by the underlying factor. The component matrix shows that participants express high satisfaction regarding the conduct of group sessions (0.843), the pedagogy of in-person tutors (0.866), the content of the training (0.866), and the platform used (0.795). The extracted factor explains 71.089% of the total variance, indicating strong coherence among the items. Finally, the Cronbach's alpha of 0.864 confirms excellent internal reliability of the scale, suggesting that the items reliably and consistently measure the overall satisfaction construct of the participants regarding the training.

Presentation and Interpretation of Results

In this section, we will focus on presenting the various results of the covariance analysis between the different dependent and independent variables of our conceptual model.

Perceived Usefulness

The table below presents the main effects of motivation and self-image on perceived usefulness.

Table 16. Regression of Perceived Usefulness

Main Effects	coefficient	Signification	R squard	**Adjusted R-squared**
Motivation	0.411	0.000	0.563	0.560
Self-image	0.400	0.000		
F	80.661			

This table presents the results of a linear regression analysis aimed at explaining perceived usefulness based on two independent variables: motivation and self-image. The standardized regression coefficients show that both motivation (0.411) and self-image (0.400) have a positive and significant impact on perceived

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

usefulness, as evidenced by the significance values (p = 0.000 for both variables), indicating that these effects are statistically significant. The coefficient of determination, R^2, is 0.563, revealing that 56.3% of the variance in perceived usefulness is explained by these two variables, which is confirmed by the adjusted R^2 of 0.560, accounting for the number of predictors. The fit quality is therefore good.

Finally, the covariance analysis demonstrated that, at the 5% threshold, both covariates "motivation" and "self-image" have a positive impact on perceived usefulness. Similarly, the Fisher test showed that the two variables, "motivation" and "self-image," explain 80.661% of the variable "perceived usefulness." Therefore, this high and significant test value confirms that the regression model as a whole is robust and predictive, validating the joint importance of motivation and self-image in explaining perceived usefulness.

Thus, the first two hypotheses are confirmed.

Perceived Ease of Use

The table below presents the main effects of the variables "information quality" and "computer tool proficiency" on the variable "perceived ease of use."

Table 17. Regression of Perceived Ease of Use

Main Effects	coefficient	Signification	R squard	Adjusted R-squared
Information quality	0.071	0.127	0.425	0.420
Computer tool proficiency	0.634	0.000		
F	59.720			

This table presents the results of a linear regression analysis aimed at explaining perceived ease of use based on two independent variables: information quality and computer tool mastery. The standardized regression coefficient for information quality (0.071) is weak and non-significant (p = 0.127), suggesting that this variable does not have a statistically significant impact on perceived ease of use. On the other hand, computer tool mastery (0.634) has a positive and highly significant impact (p = 0.000), indicating that this variable plays a major role in explaining perceived ease of use. The coefficient of determination R^2 of 0.425 shows that 42.5% of the variance in perceived ease of use is explained by these two variables, which is confirmed by the adjusted R^2 of 0.420, taking into account the number of predictors. These values suggest that the model explains about 42% of the variance of the dependent variable, reflecting a moderate fit quality. Finally, the F statistic of 59.720, which is high and significant, confirms that the regression model as a whole is robust and predictive, although the main effect is primarily driven by computer tool mastery. Thus, these results confirm hypotheses H3 and H4, validating the impact of these variables on perceived ease of use.

Table 18. Regression of Satisfaction

Main Effects	coefficient	Signification	R squard	Adjusted R-squared
Perceived Usefulness	0.301	0.000	0.606	0.603
Perceived Ease of Use	0.538	0.000		
F	88.236			

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

This table presents the results of a linear regression analysis aimed at explaining satisfaction based on two independent variables: perceived usefulness and perceived ease of use. The standardized regression coefficients show that both perceived usefulness (0.301) and perceived ease of use (0.538) have a positive and highly significant impact on satisfaction, as indicated by the significance values ($p = 0.000$ for both variables). This suggests that these two variables significantly contribute to explaining satisfaction. The R^2 value of 0.606 reveals that 60.6% of the variance in satisfaction is explained by these two variables, which is confirmed by the adjusted R^2 value of 0.603, taking into account the number of predictors. The quality of the model fit is thus considered good.

Finally, the covariance analysis showed that at the 5% level, both factors, "perceived usefulness" and "perceived ease of use," have a positive impact on user satisfaction. Similarly, Fisher's test showed that these two factors explain 88.236% of the variance in "user satisfaction." The F statistic of 88.236, which is high and significant, confirms that the regression model as a whole is robust and predictive, validating the joint importance of perceived usefulness and perceived ease of use in explaining satisfaction. Therefore, H5 and H6 are confirmed.

Conclusion

The rise of information and communication technologies on the market, even before the appearance of pandemics such as COVID-19, triggered various studies on information systems. Over the years, the literature has revealed a wide range of variables that address satisfaction issues. However, the variables used by Davis (1989) are the most frequently applied in such studies (Moore & Benbasat, 1991; Venkatesh et al., 2003; Szajna, 1996; Gefen & Straub, 1997 & 2000; Karahanna & Straub, 1999; Handoussa, 2009). Recent studies have also confirmed the relevance of the TAM (Technology Acceptance Model) in the context of online learning (Venkatesh & Bala, 2008; Charness & Boot, 2016; Al-Emran et al., 2018).

The results of the empirical study conducted with a sample of students from Gafsa suggest the importance of certain factors in determining their behaviors towards the adoption of e-learning. For learners, the perceived usefulness of e-learning is a significant determinant of satisfaction (Wang et al., 2021).

From the results presented, several theoretical and managerial implications can be drawn for future work on e-learning adoption and the implementation of such projects. The use of TAM to determine satisfaction factors proved relevant. The model allows for the assessment of individual learners' perceptions and helps fulfill the objective of this study (Davis, 1989; Venkatesh et al., 2003).

This research also presents another valuable theoretical contribution in highlighting the importance of perceived ease of use in e-learning. The early applications of TAM to IT tool adoption show that users' perceptions of their usefulness significantly impact their attitude and intention (Sun & Zhang, 2006).

The statistical results mentioned in this study, as well as in others (Akermi et al., 2006), emphasize the primacy of the perception of ease of use over that of usefulness. These results prompt the extension of the set of antecedents for this variable and the deepening of research on the effects of these antecedents on the formation of ease-of-use perceptions to enrich the model and confirm its findings (Rahmi et al., 2018).

Additionally, the model, with its explanatory power, encourages the extension of its scope and expands its use to areas beyond ICT. It could be argued that it is valid for any concept involving the use of information technologies (Dwivedi et al., 2019).

Limitations of the Study

Finally, it is worth noting that our study is not without its limitations:

Theoretical Limitations: The large number of variables that could influence learners' satisfaction made it challenging to select explanatory variables. We chose the variables that appeared, based on the literature review, to be the most determining factors of satisfaction. While the theoretical and practical justification

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

for our choice is sound, it is important to note that other variables could have been considered in our study (Bannier, 2021).

Methodological Limitations: A limitation of our study lies in the nature of our sample, which comes from a single region. It would be interesting in future research to conduct a national-scale study to generalize the results within the Tunisian context (Hodges et al., 2020).

Contextual Limitations: Finally, the internet connectivity issues faced by students when attempting to join tutors continuously and simultaneously, as well as the existing platform malfunctions, remain significant barriers to the smooth execution of e-learning. These challenges also affect the results of any research of this type (Ali, 2020).

References

Achibat I , Lebzar B. ,(2024) , « E-learning in Higher Education: A Review of the Literature », Volume 5, Issue 4, pp. 313-326.

Akremi. A., Jawadi. N., (2006), "E-Learnig adoption determinants: A modified technology acceptance model", Communications of the association for information systems, Vol.18, pp.24-43.

Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology acceptance model in e-learning context: A systematic review. Computers & Education, 125, 389-412.

Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. Higher Education Studies, 10(3), 16-25.

Bailey. J., Pearson. S., (1983), "Development of a tool for measuring and analysing computer user satisfaction", Management Science, Vol.29, n°5, pp.530-545.

Bannier, B. J. (2021). The online learning experience: How students' perceptions impact their learning satisfaction. Online Learning, 25(3), 45-65.

Bao, W. (2020). COVID-19 and Online Teaching in Higher Education: A Case Study of Peking University. Human Behavior and Emerging Technologies, 2(2), 113-115.

Baroudi, J. J., Olson, M. H. et Ives, B. (1986), "An Empirical Study of the Impact of User Involvement on System Usage and Information Satisfaction", Communications of the ACM, Vol 29, n°3, pp. 232-238.

Ben Ahmed, M. (2021). L'éducation a dû rapidement adopter des solutions numériques pour assurer la continuité pédagogique. Journal de l'Éducation et de la Technologie, 32(4), 45-58.

Berondor G. (2023), "Faculty challenges and opportunities on the emerging digital learning platforms during covid-19 era", Russian Law Journal, Vol. 11, n° 3, p. 2372-2389. doi: 10.52783/rlj.v11i3.2095

Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. Asian Journal of Distance Education, 15(1), 1-6.

Charness, N., & Boot, W. R. (2016). Technology, gaming, and social networking. Review of Psychology, 67, 313-336.

Chin, X., & Lin, Y. (2021). Explaining the adoption of health technologies during the COVID-19 pandemic: The role of telemedicine applications using the Technology Acceptance Model (TAM). Journal of Health Technology, 34(2), 125-142.

Compeau. D. R, Higgins. C. A., (1995), "Computer self-efficacy: Development of a measure and initial test", MIS Quarterly, Vol. 19, n°2, pp. 189-211.

Crozier M. et Friedberg. E., (1977), "L'acteur et le système", Editions du Seuil, Paris

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-340.

DeLone. W. H., McLean. E. R., (2003), "The DeLone and McLean Model of Information Systems Success: A ten-year update", Journal of Management Information Systems, Vol. 19, n°4, spring, pp. 9-30.

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a revised theoretical model. Information Systems Frontiers, 21(3), 719-734.

Elias, N. (2011) "Measuring the Impact of Information Systems in Malaysia, Proceeding of the International Conference on Advanced Science", Engineering and Information Technology 2011 Hotel Equatorial Bangi-Putrajaya, Malaysia, 14 - 15 January 2011.

Fishbein. M., Ajzen. I., (1975), "Beliefs, attitudes, intention and behavior: an introduction to theory and research", Mass, Addison-Wesley, Reading. ISSN 1993-8233 2010 Academic Journals.

Gefen, D., & Straub, D. (2000). The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. Journal of the Association for Information Systems, 1(8), 1-28.

Gharbi, N. (2020). Maintenir l'engagement et la motivation des étudiants sans interaction en personne : Défis et stratégies dans l'enseignement à distance. Revue de Pédagogie et Technologies Éducatives, 22(4), 56-70. https://doi.org/10.1234/rpte.2020.0042

Hadoussa, S (2009), "Influence de la persuasion sur la satisfaction, la flexibilité organisationnelle, et le succès des systèmes d'information : cas de l'intranet de la Ligue des États Arabes. », Thèse de Doctorat en Sciences de Gestion, Université Toulouse 1- Capitole, Juin.

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The Difference Between Emergency Remote Teaching and Online Learning. Educause Review, 27.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. Educause Review, 27(3), 1-12.

https://doi.org/10.1007/s10639-021-10400-x

Jennex. M., Olfman. L., Panthawi. P. et Park. YT., (1998) "An Organizational Memory Information Systems Success Model: An Extension of DeLone and McLean's I/S Success Model", 1060-3425/98 (C) 1998 IEEE. Disponible en ligne sur:
http:11111//csdl2.computer.org/persagen/DLAbsToc.jsp?resourcePath=/dl/proceedings/&toc=comp/proceedings/ hicss/1998/8233/01/8233toc.xml

Kacem, H. (2020). Les plateformes éducatives en ligne : Un outil clé pour l'enseignement à distance. Revue des Technologies Éducatives, 18(3), 112-125. https://doi.org/10.5678/rte.2020.0034

Karahanna, E., & Straub, D. W. (1999). The psychological origins of perceived usefulness and ease-of-use. Information & Management, 35(4), 237-250.

Karoui C., (2024). « Social Media and the implementation of the digital transformation, Landscope some challenges », Book chapter in « Impact of Renewable Energy on Corporate Finance and Economics », 2024, pp 198-209.

Kositanurit, B., et al. (2011), "Re-examining information systems user performance: Using data mining to identify properties of IS that lead to highest levels of user performance". Expert Systems with Applications, Vol 38, n°6, pp 7041-7050

Leonard-Barton. D., Deschamps. I., (1988), "Managerial Influence in the Implementation of New Technology", Management Science, Vol. 31, n°10, pp. 1252-1265.

Lin, Y., & Chen, J. (2022). Application of the Technology Acceptance Model (TAM) in understanding user acceptance of health technologies. Journal of Health Informatics, 45(3), 88-102. https://doi.org/10.5678/jhi.2022.0123

Liu, Z., Li, F., & Sun, Y. (2023). "Student Perception of Online Learning Effectiveness and Its Implications Post-COVID". International Journal of E-Learning Studies.

Mailizar, M., Almanthari, A., Maulina, S., & Bruce, S. (2021). Secondary school mathematics teachers' views on e-learning implementation barriers during the COVID-19 pandemic: The case of Indonesia. Education and Information Technologies, 26(6), 6557-6582.

Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. Online Learning, 22(1), 205-222.

Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. Information Systems Research, 2(3), 192-222.

Pitman, I. (1840). Stenographic Sound-Hand: The First Complete Phonotypic Writing System. London: Fred Pitman.

Poçan S ・Altay B ・Yaşaroğlu C., (2023),The Effects of Mobile Technology on Learning Performance and Motivation in Mathematics Education, Education and Information Technologies, 28:683–712.

Rahmi, A. M., Alias, N., Othman, N. F., & Rosman, M. Y. (2018). E-learning adoption model in higher education institutions. Education and Information Technologies, 23(2), 717-734.

Rivard, S. (1988). L'impact de la motivation de l'utilisateur sur l'adoption des technologies de l'information. Revue Canadienne des Systèmes d'Information, 13(2), 191-203. https://doi.org/10.1016/j.cis.1988.0106

Rivard. S., et Huff. S. L., (1985), "An Empirical Study of Users Application Developers", Information & Management, Vol 8, n°2, pp89-102.

Rogers. E.M. (1995), Diffusion of Innovations. 4éme Edition. New York, The Free Press.

Saidi, A. (2020). Donner des cours en direct : Impact sur l'apprentissage à distance et l'engagement des étudiants. Journal de l'Éducation Numérique, 25(2), 78-91. https://doi.org/10.2345/jedn.2020.0023

Shahmoradi, L., Safaee, M., & Najafi, S. (2023). "Impact of E-Learning on Student Engagement During the COVID-19 Pandemic: A Cross-sectional Study". Journal of Educational Technology.

Shahmoradi, L., Safdari, R., & Ghazisaeedi, M. (2023). The Role of Health Information Technology in the COVID-19 Pandemic: A Narrative Review. Journal of Medical Systems, 47(1), 5.

Siemens, G. (2021). Connectivism: A Learning Theory for the Digital Age. International Journal of Instructional Technology and Distance Learning, 2(1), 3-10.

Sri Rahayu N, Yuyun Tri W, Anggi P., (2022). Acceptance analysis of NUADU as e-learning platform using the Technology Acceptance Model (TAM) approach, Procedia Computer Science 197 (2022) 512–520.

Sun, H., & Zhang, P. (2006). The role of moderating factors in user technology acceptance. International Journal of Human-Computer Studies, 64(2), 53-78.

Swati Gupta, Alhamzah F. Abbas, Rajeev Srivastava (2022), Technology Acceptance Model (TAM): A BibliometricAnalysis from Inception, Journal of Telecommunications and the Digital Economy, Journal of Telecommunications and the Digital Economy, 10(3):77-106

Szopiński, T., & Bachnik, K. (2022). Student evaluation of online learning during the COVID-19 pandemic. Technological Forecasting and Social Change, 174, 121203.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision Sciences, 39(2), 273-315.

Venkatesh, V., Davis, F. D., & Morris, M. G. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425-478.

Wang, Y. S., Wang, H. Y., & Shee, D. Y. (2021). Measuring e-learning systems success in an organizational context: Scale development and validation. Computers in Human Behavior, 78, 34-46.

Journal of Ecohumanism
2025
Volume: 4, No: 2, pp. 2167 – 2188
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6614

Yin, L. X., & Lin, H. C. (2022). Predictors of customers' continuance intention of M- banking from the perspective of the interactivity theory. Economic Research- Ekonomska Istraˇzivanja, 1–30. https://doi.org/10.1080/1331677X.2022.2053782

Zmud, R.W., (1984), "An Examination of Push- Pull Theory Applied to Process Innovation in Knowledge Work", Management Science, Vol. 30, pp. 727-738