The Impact of Technology Utilization and Digital Literacy on The Satisfaction of Adopting Campus Information Systems

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ABSTRACT

In the realm of education, digital literacy encompasses various aspects such as ensuring equitable access to technology, nurturing critical thinking abilities, cultivating information literacy, and instilling responsible digital citizenship. These endeavors aim to equip individuals with the essential skills and knowledge needed to effectively and responsibly navigate the vast realm of digital information. The research aims to explore the impact of technology utilization and digital literacy on the satisfaction of adopting campus information systems. The author employed a non-parametric approach, specifically PLS-SEM, in this study by conducting a survey among students who have utilized the campus information system. The research involved a total of 243 student respondents who participated through a Google Form. The validity and reliability testing indicated that the data collected was both valid and reliable. Subsequently, the author proceeded to analyze the data using Partial Least Squares. The statistical analysis of the data revealed significant evidence that the utilization of technology, as indicated by Performance Expectancy, Effort Expectancy, and Digital Literacy, influences users' attitudes towards the campus information system, ultimately impacting user satisfaction.

The originality and value of the findings lie in their contribution to the existing body of knowledge in the field. The research sheds light on the relationship between technology utilization, digital literacy, attitudes towards the campus information system, and user satisfaction. By identifying and demonstrating the significant impact of these factors, the findings provide valuable insights for academia, practitioners, and decision-makers in enhancing technology adoption and improving user experiences in the educational context. Additionally, the research adds to the literature by utilizing a non-parametric approach and incorporating a large number of student respondents, thereby strengthening the validity and generalizability of the findings.

One constraint of this research is its reliance on self-reported data, which has the potential to introduce biases and inaccuracies due to the subjective nature of respondents. Furthermore, the study solely focused on the perspectives of students who have already adopted the campus information system, potentially disregarding the viewpoints and experiences of non-users. Although the sample size of respondents was considerable, it may not fully represent the entire student population, thus limiting the generalizability of the findings. Additionally, since the research was carried out within a specific educational context, the applicability of the results to other settings or institutions may be constrained. To overcome these limitations, future studies could employ a variety of data collection methods, such as longitudinal designs, and include a more comprehensive and diverse range of participants.

INTRODUCTION

In today's rapidly evolving educational landscape, digital literacy has emerged as a crucial component of comprehensive learning. (Audrin & Audrin, 2022; Nguyen & Habók, 2024; Yu, 2022) Digital literacy transcends mere technical skills; it encompasses a broad spectrum of competencies that are essential for individuals to thrive in a technology-driven world. (Buchholz, DeHart & Moorman, 2020; Peng & Yu, 2022) This multifaceted concept includes ensuring equitable access to technology for all learners (Ferri, Grifoni & Guzzo, 2020), nurturing critical thinking abilities (Martínez-Bravo, Sádaba Chalezquer & Serrano-Puche, 2022), cultivating information literacy (Avcı & Yıldız Durak, 2022), and instilling responsible digital citizenship (Milenkova & Lendzhova, 2021).

At its core, digital literacy aims to equip individuals with the essential skills and knowledge needed to effectively and responsibly navigate the vast realm of digital information. This involves not only the ability to use digital tools and platforms but also the capacity to critically assess and synthesize information, understand the ethical implications of digital interactions, and engage positively in online communities. (Burr, Taddeo & Floridi, 2020; Juhana, Komara, Sidharta & Suzanto, 2024; Murtarelli, Gregory & Romenti, 2021) The research conducted by Hussain et al. (2022) reinforces the findings that digital literacy can enhance attitudes towards using digital technologies in technology educational institutes. Additionally, the study conducted by Lev-On, Steinfeld, Abu-Kishk, and Pearl Naim (2021) demonstrates that planned digital literacy can satisfy users, increase knowledge, and boost confidence in utilizing technology. By fostering digital literacy, educators can empower students to become informed, ethical, and proactive digital citizens, capable of leveraging technology to enhance their learning and contribute meaningfully to society. In their literature review, Tinmaz, Lee, Fanea-Ivanovici, and Baber (2022) discovered the significance of critical digital literacy in terms of an individual's ability to access and evaluate digital technologies and effectively utilize information. This level of literacy encompasses analytical thinking and interdisciplinary approaches to problem-solving. Ensuring equitable access to technology is a foundational aspect of digital literacy. It addresses the digital divide, ensuring that all students, regardless of their socioeconomic background, have the opportunity to engage with digital tools and resources. This access is critical for leveling the playing field and providing every student with the chance to develop the necessary skills for success in the digital age.

The research conducted by Erdem, Oruç, Atar, and Bağcı (2023) highlights the importance of fostering critical thinking skills as an integral aspect of digital literacy. In today's era of information abundance and overwhelming content, the ability to critically assess sources, distinguish credible information from misinformation, and make informed decisions holds utmost significance. Critical thinking enables students to navigate the digital landscape with a discerning eye, fostering a more informed and engaged populace. Cultivating information literacy is intertwined with critical thinking. It involves teaching students how to locate, evaluate, and use information effectively. This skill is crucial for academic success and lifelong learning, as it empowers students to independently seek out knowledge and apply it in various contexts.

According to Eden, Chisom, and Adeniyi (2024), cultivating responsible digital citizenship is crucial in establishing a secure and respectful online environment. Responsible digital citizens recognize the consequences of their online behavior, respect the privacy and rights of others, and actively contribute to the growth and well-being of digital communities. This aspect of digital literacy promotes a culture of respect and accountability in the digital realm.

Digital literacy is a comprehensive framework that encompasses equitable access to technology, critical thinking, information literacy, and responsible digital citizenship. By integrating these elements into education, we can prepare individuals to navigate the complexities of the digital world effectively and responsibly, ultimately fostering a more informed, equitable, and connected society. The research conducted by Vermisli, Cevik, and Cevik (2022) reveals that student satisfaction with digital literacy levels is enhanced when distance education is supported by accessible technological facilities.

The UTAUT model, formulated by Venkatesh, is widely employed to forecast the behavioral tendencies associated with technology adoption. It takes into account various factors such as performance expectancy, effort expectancy, social norms, and facilitating conditions. Derived from the Theory of Planned Behavior, Technology Acceptance Model, Theory of Reasoned Action, and the Innovation Diffusion Theory, UTAUT offers a comprehensive framework for understanding and predicting technology adoption patterns.

The UTAUT model is widely utilized for measuring the adoption of technology in various contexts. (Sidharta & Sidh, 2014; Yusup, Hardiyana & Sidharta, 2015) For instance, it has been applied to assess the implementation of AI in early warning systems (Raffaghelli et al., 2022), automated transportation systems (Madigan et al., 2016), virtual simulations (González Bravo et al., 2020), bicycle sharing programs (Jahanshahi, Tabibi & Van Wee, 2020), online learning platforms (Batucan et al., 2022), social learning environments (Khechine, Raymond & Augier, 2020), and the acceptance of AI-assisted learning (Wu, Zhang, Li & Liu, 2022).

Despite the widespread adoption of campus information systems in educational institutions, there remains a significant variation in user satisfaction levels. (Al-Rahmi et ell., 2021; Chen, et ell., 2020; Sidharta & Suzanto, 2015) This discrepancy often stems from differences in technology utilization and digital literacy among users. While some students and staff are able to seamlessly integrate these systems into their daily activities, others face challenges that hinder their overall satisfaction and effectiveness. Understanding the specific factors related to technology use and digital literacy that influence satisfaction can help institutions improve their information systems and support structures, thereby enhancing the overall user experience. The aim of this study is to explore the impact of technology utilization and digital literacy on the satisfaction levels of users adopting campus information systems. By achieving these objectives, the study aims to offer insights that can guide the development of more user-friendly campus information systems and support strategies that enhance the overall user experience.

METHOD

This study employed a quantitative research design using a non-parametric approach, specifically Partial Least Squares Structural Equation Modeling (PLS-SEM). This method is suitable for exploring complex relationships between variables and is particularly effective for studies involving constructs that are not normally distributed.

The main data for this study was gathered by administering a survey among students who have utilized the academic information system on the campus. The survey was conveniently

distributed online through the use of Google Forms, allowing for easy access and participation. The targeted participants were students in their third and fourth year who have utilized the academic information system at Sekolah Tinggi Ilmu Ekonomi Pasundan, located in Bandung. The study involved a total of 243 student respondents. These students were selected based on their experience with using the campus information system, ensuring that the sample was relevant to the research objectives.

The survey instrument was designed to measure the following constructs:

Technology Utilization as: Questions assessing the extent and manner in which students use the campus information system user's effort expectancy and performance expectancy. (Venkatesh et al., 2003)

Digital Literacy: Questions evaluating the students' competencies in using digital tools and their understanding of digital content use, the indicator encompasses the utilization of campus information systems, the access to credible and dependable information, the willingness to collaborate and share knowledge, and the fulfillment of learning requirements. (Na-Nan, Roopleam & Wongsuwan, 2020)

User Satisfaction: Questions aimed at gauging the overall satisfaction of students with the campus information system. The author developed the indicators for user satisfaction of academic information systems based on the work of Suzanto & Sidharta (2014), expressing satisfaction with the convenience of information availability, performance, relevance of information, and timely delivery of academic information provided by the campus information system.

The survey included a mix of Likert-scale questions to capture the degree of agreement or frequency of use, along with demographic questions to provide context. To ensure the accuracy and consistency of the survey instrument, both validity and reliability tests were conducted. To ascertain content validity, the research instrument ensured that the outer loading values exceeded 0.5. Construct validity was assessed using Cronbach's alpha and AVE. The reliability of the survey instrument was evaluated using Cronbach's alpha and AVE to ensure internal consistency of the constructs. The results indicated that the data collected was both valid and reliable, making it suitable for further analysis.

The data obtained from the survey underwent analysis using Partial Least Squares (PLS). This method was chosen for its ability to handle complex models and its suitability for exploratory research. Evaluating the reliability and validity of the constructs. Testing the hypothesized relationships between technology utilization, digital literacy, and user satisfaction. The examination was carried out employing the specialized SmartPLS software, which is tailored for conducting PLS-SEM analyses. This software efficiently facilitated the evaluation of both the measurement and structural models, offering comprehensive insights into the interconnections among the variables.

By employing this rigorous methodological approach, the study aimed to provide a robust understanding of the impact of technology utilization and digital literacy on the satisfaction of adopting campus information systems.

RESULTS AND DISCUSSION

In this study, female students dominated the respondents, accounting for 60.84% compared to male students. Additionally, fourth-year male students who were preparing to undertake their final assignments constituted the majority, comprising 62.17% of the total respondents.

Tabel 1. Test of Outer Loading, Validity and Reliability

Instrument	Performance expectancy	Effort expectancy	Digital Literacy	Behavior	User Satisfaction
PExp1	0,854				
PExp2	0,790				
PExp3	0,842				
PExp4	0,886				
EfPer1		0,881			
EfPer2		0,923			
EfPer3		0,927			
EfPer4		0,871			
DigLit1			0,805		
DigLit2			0,857		
DigLit3			0,790		
DigLit4			0,726		
BehInt1				0,864	
BehInt2				0,896	
BehInt3				0,839	
BehInt4				0,889	
UsSat1					0,794
UsSat2					0,876
UsSat3					0,800
UsSat4					0,790
Cronbach's Alpha	0,865	0,922	0,805	0,895	0,832
Composite Reliability	0,908	0,945	0,873	0,897	0,888
Average Variance Extracted (AVE)	0,712	0,812	0,633	0,761	0,666

The findings in Table 1 indicate that the constructs of performance expectancy, effort expectancy, digital literacy, behavior, and user satisfaction all demonstrated validity. This was evidenced by the outer loading values exceeding 0.5, Cronbach's Alpha coefficients of 0.865, 0.922, 0.805, 0.895, and 0.832 respectively, as well as Composite Reliability values of 0.908, 0.945, 0.873, 0.897, and 0.888 respectively, all surpassing the threshold of 0.7. Additionally, the Average Variance Extracted (AVE) values of 0.712, 0.812, 0.633, 0.761, and 0.666 respectively were all greater than 0.5, further confirming the constructs' validity.

Tabel 2. Result of Technology Utilization and Digital Literacy on The Satisfaction Levels of Users Adopting Campus Information Systems

Path	Coefficient	Standard Dev.	P value	Significancy
Performance Expectancy -> Behavior	0,484	0,063	0,000	significant

Effort Expectancy -> Behavior	0,400	0,057	0,000	significant
Behavior -> User Satisfaction	0,132	0,057	0,021	significant
Digital Literacy -> User Satisfaction	0,629	0,054	0,000	significant
Behavior	R Square=0,650		R Square Adjusted=0,647	
User Satisfaction	R Square=0,504		R Square Adjusted=0,500	

In table 2 show the significant relationships between Performance Expectancy and Behavior, with a coefficient of 0.484. Similarly, Effort Expectancy exhibited a significant impact on Behavior, with a coefficient of 0.400. Furthermore, Behavior was found to have a significant influence on User Satisfaction, showing a coefficient of 0.132. In addition, Digital Literacy demonstrated a significant effect on User Satisfaction, with a coefficient of 0.629. These results are clearly depicted in Figure 1, providing a visual representation of the findings.
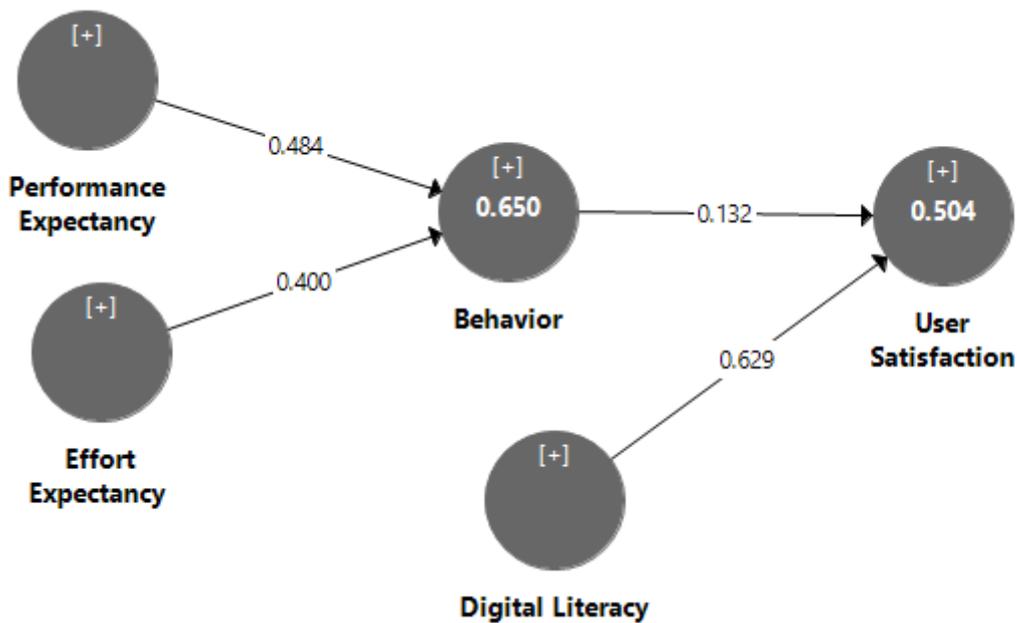

Figure 1. The Findings of Technology Utilization and Digital Literacy on The Satisfaction Levels of Users Adopting Campus Information Systems

The findings of this study provide significant insights into the factors that influence user satisfaction with campus information systems. The statistical analysis revealed that the utilization of technology, as indicated by performance expectancy, effort expectancy, and digital literacy, plays a crucial role in shaping users' attitudes towards these systems. This discussion delves into the implications of these findings and their relevance to the broader context of digital literacy and technology adoption in educational environments.

Performance Expectancy, which refers to the degree to which users believe that using the campus information system will help them achieve their goals, was found to have a

significant positive impact on user satisfaction. This aligns with existing literature suggesting that users are more likely to be satisfied with a technology if they perceive it as useful and capable of enhancing their performance (Venkatesh et al., 2003). This study supports the findings of Batucan et al. (2022), which demonstrate that performance expectancy plays a crucial role in shaping students' behavioral intention to use the online learning system. It suggests that students' belief in the system's ability to assist them directly influences their intention to actually utilize the system for online learning purposes. In the context of educational institutions, this means that students who see clear academic and administrative benefits from using the campus information system are more likely to have a positive attitude towards it. Therefore, institutions should focus on clearly communicating the benefits and capabilities of their information systems to enhance user satisfaction.

Effort Expectancy, which measures the ease of use associated with the campus information system, also emerged as a significant predictor of user satisfaction. Systems that are perceived as easy to use are more likely to be adopted and appreciated by users. This finding underscores the importance of user-friendly design and intuitive interfaces in the development of campus information systems. (Sidharta & Rahmahwati, 2023) The current study aligns with the research conducted by Abbad (2021), which highlights the significance of effort expectancy in determining the ease with which students adopt behavioral intentions to utilize an e-learning system at a public university in Jordan. Educational institutions should invest in usability testing and iterative design processes to ensure that their systems are accessible and straightforward for all users, thereby reducing the cognitive load and effort required to use the system effectively.

Digital Literacy was another critical factor influencing user satisfaction. Students with higher levels of digital literacy, encompassing skills such as critical thinking, information evaluation, and responsible digital behavior, reported higher satisfaction levels with the campus information system. The research findings align with the study conducted by Abdulkareem and Ramli (2021), which indicate that a high level of digital literacy contributes to user satisfaction among e-government users in Nigeria. The research findings are in line with the study conducted by Reddy, Chaudhary, and Hussein (2023), which demonstrate that users expressed satisfaction with their digital literacy, reflecting a positive attitude. This highlights the importance of digital literacy education in enhancing the overall user experience. Institutions should consider incorporating digital literacy training into their curricula and providing ongoing support to help students develop these essential skills. By doing so, they can ensure that all students are equipped to navigate and utilize the campus information system effectively.

The interrelationship between performance expectancy, effort expectancy, and digital literacy suggests a holistic approach to improving user satisfaction. Enhancing any one of these factors is likely to positively influence the others. For instance, increasing digital literacy can make the system easier to use (improving effort expectancy) and help users better understand how the system can aid their academic goals (enhancing performance expectancy). This interconnectivity implies that educational institutions should adopt a comprehensive strategy that simultaneously addresses multiple aspects of technology utilization and user support.

The study conducted by Sousa & Rocha (2019) emphasizes the importance of digital skills in the context of disruptive digital business. The main focus of digital learning revolves around mobile technologies, tablets, and smartphone applications. These learning environments incorporate social aspects within the digital content, encourage informal problem-solving, facilitate knowledge sharing, foster communities of practice, and promote the creation of user-generated content. The study establishes a connection between these

digital skills and the latest developments in skill development, ultimately influencing the digital transformation of organizations. By enhancing effort expectancy and improving performance expectancy, the integration of technology in academics can lead to a more satisfactory user experience and promote digital literacy. The study conducted by Tewari, Singh, Mathur, and Pande (2023) delves into exploring how students adopt online learning and how having an open mind moderates the impact on higher education in public and private universities in India. These findings imply that digital literacy plays a crucial role in shaping attitudes towards adopting online learning technology. The study conducted by Yeşilyurt and Vezne (2023) reveals that digital literacy is a significant factor influencing the attitudes towards the usage of technology, specifically computers, in learning. This integration of technology in learning leads to enhanced efficiency in the learning process.

CONCLUSION AND RECOMMENDATION

Overall, this study highlights the significant impact of technology utilization, as indicated by performance expectancy, effort expectancy, and digital literacy, on user satisfaction with campus information systems. These findings reinforce the need for a multifaceted approach to technology adoption in educational contexts, emphasizing the importance of usability, clear communication of benefits, and robust digital literacy education. Future research could further explore these relationships in different educational settings and with diverse user groups to build on these insights and develop more tailored strategies for enhancing user satisfaction.

The research findings hold significance and originality as they contribute to the existing knowledge in the field. They shed light on the correlation between technology utilization, digital literacy, attitudes towards the campus information system, and user satisfaction. These insights are valuable for academia, practitioners, and decision-makers in improving technology adoption and enhancing user experiences in education. The research stands out by utilizing a non-parametric approach and involving a large number of student respondents, which enhances the validity and generalizability of the findings.

In summary, this research has identified a few limitations. Firstly, the reliance on self-reported data may introduce biases and inaccuracies due to respondents' subjectivity. Secondly, the study focused solely on the perspectives of students who have already adopted the campus information system, potentially neglecting the experiences of non-users. Additionally, while the sample size was substantial, it may not represent the entire student population, limiting the generalizability of the findings. Lastly, the research was conducted within a specific educational context, which may restrict the applicability of the results to other settings or institutions. Future studies can address these limitations by utilizing diverse data collection methods and expanding the participant pool to enhance the validity and generalizability of the findings.

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