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Student Perspectives on the Importance of Digital Security Technology in Higher Education

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ABSTRACT

The dependence on digital technology in higher education has increased the need for digital security technology. This study aims to explore students' perspectives on the importance of digital security in Indonesian higher education, focusing on factors such as motivation, behavior, trust, and intention to use digital security technology. Using a quantitative descriptive approach and cross-sectional design, data were collected from 91 respondents through a Likert scale questionnaire covering the variables of Motivation and Behavior, Perceived Trust, Electronic Word of Mouth, Actual Use, and Intention to Use. The results show that students have high motivation and positive behavior towards the use of digital security technology, supported by their trust in the effectiveness of the technology and the role of the government. These findings indicate that the adoption of digital security technology can be strengthened through better digital security education and literacy, as well as supportive policies. This research contributes theoretically to the literature on technology acceptance in higher education and offers practical insights for increasing student awareness and participation in digital security.

INTRODUCTION

Digital technology, including learning management systems and artificial intelligence, has transformed the way education is delivered, increasing student engagement and providing greater access, especially for students in remote areas [1],[2]. However, challenges such as the digital divide and data privacy remain a concern, making it important to provide equitable access to technology [2]. Educational institutions need to create culturally responsive learning environments while continuing to innovate in teaching methods to meet the diverse needs of students [3]. In addition, continuous investment in flexible technologies, such as mobile learning and cloud-based resources, is an important step in improving the quality of education and student competency in the digital age [4],[5].

Cybersecurity is an urgent priority for higher education due to threats such as data breaches, phishing attacks, and disruption to academic operations [6],[7]. Although mitigation technologies such as encryption and two-factor authentication have been implemented, user cybersecurity literacy remains varied, influenced by demographic factors and academic disciplines [7],[8]. Dependence on cloud technology also brings new risks that require strategic management [9]. Educational institutions face learning impacts, foreign interference, and financial losses, making the integration of cybersecurity education into the curriculum an urgent necessity [10],[11]. This study addresses the cyber literacy gap among university students by focusing on six variables, including Motivation and Behavior and Perceived Trust, to explore specific behaviors and beliefs. Unlike previous studies that focused more on China, this study offers a more relevant local perspective in Indonesia [12]. The findings are expected to provide a basis for digital security policies that are in line with global guidelines such as NIST, as well as a strategic approach to higher education [13],[14].

This study explores students' perspectives on the importance of digital security technology in higher education, specifically how motivation, behavior, and trust influence its use [15]. The study aims to enrich the literature on the acceptance of digital security technology while providing practical guidance for institutions to design effective policies to increase student awareness and participation. The research focuses on the higher education sector in Indonesia, highlighting cyber threats such as data breaches and ransomware that can damage the reputation and operations of institutions [16]. The results are expected to strengthen the digital security posture, increase stakeholder trust, and support professional development in cybersecurity that is relevant to current digital transformation trends. In addition, this research is also expected to make a real contribution to enriching the academic literature on digital security literacy and acceptance in Indonesia, as well as providing a basis for higher education institutions in designing policies and learning strategies that are more adaptive to the challenges of the digital age. Thus, this study not only plays a role in responding to the practical needs of the education sector and society, but also strengthens the role of academics in providing evidence-based recommendations for strengthening the cybersecurity ecosystem at the national and global levels.

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METHODOLOGY

The author used a qualitative descriptive research approach with a cross-sectional design in developing this scientific article [12]. A cross-sectional design was chosen to collect data at a single point in time to describe the phenomenon that was occurring without any intervention or manipulation of variables [17]. The research sample consisted of students selected through a questionnaire, covering individuals with varying levels of knowledge and experience, including those who had no understanding or experience at all in the use of digital security technology in higher education environments. Data collection was conducted using a 1-5 Likert scale questionnaire, with answers ranging from "strongly disagree" to "strongly agree," to measure various variables, such as Motivation and Behavior, Perceived Trust, Electronic Word of Mouth, Actual Use, Intention to Use for Information, and Intention to Use for Interaction related to digital security technology [12],[18].

Table 1
Research Instrument Aspects

No	Aspect	Statement	Statement Number	Reference
1	*Motivation and Behavior*	I have digital security tools that I can use to protect my personal data	1	[19]
		I can use digital security systems, such as antivirus and firewalls	2	
		I am motivated to learn about the latest digital security technologies	3	
		The use of digital security technologies has become a daily necessity	4	
		I must use digital security technologies to protect my information and devices	5	
		The use of digital security applications has become commonplace	6	
		I feel that the benefits of digital security applications outweigh the effort required to learn them	7	
2	*Perceived Trust*	I believe in the security of using Digital Technology	1	
		I am confident that existing security technologies and legal frameworks effectively protect me from online risks	2	
		I believe that the government encourages the use of Digital Security Technologies	3	
		I believe that the government can be trusted to respect my digital privacy	4	
		I believe that the current digital environment is safe, and that we can engage in digital activities with the government safely	5	
		I believe that digital security technologies help protect my learning and research data	6	
3	*Electronic Word of mouth*	I use social media and eWOM to encourage people to use digital security technology	1	
		I believe eWOM helps in the use of digital security technology in educational activities	2	
		I have accessed eWOM about digital security tools and am satisfied with the information	3	
		Online reviews and recommendations about digital security technology are very helpful to me	4	
4	*Actual Use*	Saya percaya bahwa teknologi keamanan digital diperlukan untuk melindungi data saya setiap saat	1	
		Untuk mengamankan data di mana saja, saya percaya saya harus menggunakan Teknologi Keamanan Digital	2	
		Unexpected data security issues are something I am always wary of	3	

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		I believe that using digital security technology allows me to keep my data secure anywhere without interruption	4
		I believe that using digital security technology will provide real-time security protection and services	5
5	*Intention to Use for Information*	I will consider using digital security technology	1
		I will continue to use digital security technology	2
		I will inform others about the benefits of digital security technology	3
		I will use the resources necessary to use digital security technology	4
		I pay sufficient attention to using digital security technology for my education	5
6	*Intention to Use for Interaction*	The use of digital security technology for educational purposes has become commonplace	1
		I need to use digital security technology to understand and review my personal security measures	2
		The use of digital security applications has become commonplace	3
		Using digital security technology is easy	4
		Learning about computer-based technology for digital security is easy	5
		Interacting with digital security technology is simple and easy to understand	6

Based on Table 1, the measurement of research variables involves six main aspects: Motivation and Behavior, Perceived Trust, Electronic Word of Mouth, Actual Use, Intention to Use for Information, and Intention to Use for Interaction. Each aspect consists of a number of indicators, such as MB1 to MB7 for Motivation and Behavior, PT1 to PT6 for Perceived Trust, and EWOM1 to EWOM5 for Electronic Word of Mouth. The Actual Use aspect includes AU1 to AU5, Intention to Use for Information consists of ITUFI1 to ITUFI5, and Intention to Use for Interaction includes ITUFIN1 to ITUFIN6. All of these indicators are formulated based on the same reference, as indicated by the markers. [12],[19].

Descriptive statistics in this study are used to provide an overview of the characteristics of the data analyzed [20]. The data presented includes the number of respondents, missing data, mean, median, mode, standard deviation, and minimum and maximum value ranges[20],[21]. This analysis helps to understand the data distribution pattern and serves as a basis for further analysis in the study.

RESULT & DISCUSSION

This section presents the results of data analysis from 91 respondents selected through a questionnaire to describe demographic characteristics and key findings of the study. The respondents selected were individuals who had knowledge or experience in the use of digital security technology in higher education environments. Based on demographic characteristics, the majority of respondents were female (64%), while males accounted for 36%. In terms of age, the respondents were dominated by those aged 19 (62%), followed by those aged 20 (26%), 21 (7%), 18 (4%), and 22 (1%). Based on semester, most respondents were in semester 3 (80%), followed by semester 5 (13%), semester 7 (5%), and semester 1 (2%). These results show that the majority of research respondents were early semester students, aged 19 years, and dominated by women.

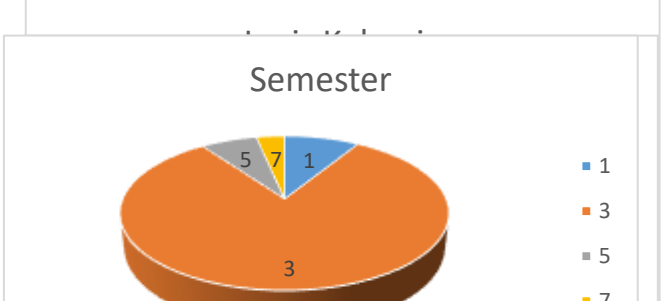

Diagram 3. Respondent Demographics Based on Gender

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The results of the analysis of the Motivation and Behavior (MB) variable show that students have high motivation and positive behavior towards the use of digital security technology. The overall average MB is 3.97, with a small standard deviation, reflecting consistent responses. The highest statement related to the importance of using digital security technology to protect information and devices (4.19) indicates a high level of awareness among students. Other statements, such as motivation to learn the latest technology (4.05) and the perception that digital security technology is a daily necessity (4.04), also received high scores. In addition, most students feel that the benefits of digital security applications outweigh the effort required to learn them (3.90). These findings indicate that students have the awareness, motivation, and behavior that support the active use of digital security technology [22].

Table 2
Descriptive Data Table on Motivation and Behavior

	MB1	MB2	MB3	MB4	MB5	MB6	MB7	AVE MB
N	91	91	91	91	91	91	91	91
Missing	0	0	0	0	0	0	0	0
Mean	3.73	3.86	4.05	4.04	4.19	4.02	3.90	3.97
Median	4	4	4	4	4	4	4	4.00
Mode	4.00	4.00	4.00[a]	4.00	5.00	4.00	4.00	3.86
Sum	339	351	369	368	381	366	355	361
Standard Deviation	0.857	0.838	0.861	0.881	0.918	0.906	0.895	0.676
Variance	0.735	0.702	0.741	0.776	0.842	0.822	0.801	0.457
Range	4	4	3	4	4	4	4	3.86
Minimum	1	1	2	1	1	1	1	1.14
Maximum	5	5	5	5	5	5	5	5.00

Descriptive analysis of Perceived Trust (PT) covers six main indicators, such as trust in digital technology security, technology effectiveness and legal frameworks, and government support in respecting privacy and maintaining data security. The average indicator score ranges from 3.52 to 3.81, with an overall average of 3.71. The median and mode values are consistent at 4, indicating that the majority of respondents gave positive responses. The low standard deviation, averaging 0.747, reflects uniform perceptions among respondents. The indicator score range is 1 to 5, with the majority of respondents giving high scores, indicating a good level of trust in digital technology security and government support.

These results show respondents' positive confidence in digital technology security, both from a technical aspect and the role of the government, and form the basis for exploring the relationship between PT and other variables in the context of digital security, particularly in the education sector [23].

Table 3
Descriptive Data Table Perceived Trust

	PT1	PT2	PT3	PT4	PT5	PT6	AVE PT
N	91	91	91	91	91	91	91
Missing	0	0	0	0	0	0	0
Mean	3.76	3.79	3.77	3.58	3.52	3.81	3.71
Median	4	4	4	4	4	4	3.83
Mode	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Sum	342	345	343	326	320	347	337
Standard Deviation	0.807	0.913	0.883	0.944	0.947	0.788	0.747
Variance	0.652	0.834	0.779	0.890	0.897	0.620	0.558
Range	3	4	4	4	4	3	3.33
Minimum	2	1	1	1	1	2	1.67
Maximum	5	5	5	5	5	5	5.00

The descriptive analysis of the Electronic Word of Mouth (eWOM) construct includes four indicators, namely the use of social media to encourage the adoption of digital security technology, the role of eWOM in educational activities, satisfaction with eWOM information, and the benefits of online reviews or recommendations. The average indicator scores ranged from 3.37 (E-WOM3) to 3.84 (E-WOM4), with an overall average of 3.58, indicating that the majority of respondents gave positive assessments of the role of eWOM. The median of the indicators ranged from 3 to 4, with a consistent mode of 3 for the first three indicators and 4 for E-WOM4.

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The standard deviation ranged from 0.806 to 0.985, reflecting relatively uniform perceptions. The score range for each indicator is 4, with a minimum value of 1 and a maximum of 5. These results indicate that despite variations in responses, the majority of respondents view eWOM as a useful and relevant source of information, particularly in supporting the use of digital security technology in education and daily activities. These findings provide important insights into understanding the influence of eWOM on the acceptance of digital security technology [24].

Table 4
Descriptive Data Table Electronic Word of Mouth

	E-WOM1	E-WOM2	E-WOM3	E-WOM4	AVE E-WOM
N	91	91	91	91	91
Missing	0	0	0	0	0
Mean	3.51	3.62	3.37	3.84	3.58
Median	3	3	3	4	3.50
Mode	3.00	3.00	3.00	4.00	3.00[a]
Sum	319	329	307	349	326
Standard Deviation	0.861	0.916	0.985	0.806	0.695
Variance	0.742	0.839	0.970	0.650	0.483
Range	4	4	4	4	3.00
Minimum	1	1	1	1	2.00
Maximum	5	5	5	5	5.00

The Actual Use descriptive analysis covers five indicators, such as confidence in the need for digital security technology to protect data, its use in various situations, and awareness of data security threats. The average indicator scores range from 3.90 to 4.18, with an overall average of 3.98, indicating a high level of confidence in the benefits and importance of digital security technology. The median for all indicators is 4, with a consistent mode of 4, except for AU3, which has a mode of 5, reflecting positive to very positive responses from the majority of respondents.

The standard deviation ranges from 0.746 to 0.864, indicating relatively uniform perceptions. With a score range of 2 to 5, this data indicates that digital security technology is seen as an important element that provides consistent data protection and reliable security services in various conditions. These findings are relevant to support the analysis of the relationship between Actual Use and other variables in the context of digital security[25].

Table 5
Actual Use Descriptive Data Table

	AU1	AU2	AU3	AU4	AU5	AVE AU
N	91	91	91	91	91	91
Missing	0	0	0	0	0	0
Mean	3.92	3.92	4.18	3.97	3.90	3.98
Median	4	4	4	4	4	4.00
Mode	4.00	4.00	5.00	4.00	4.00	4.00
Sum	357	357	380	361	355	362
Standard Deviation	0.846	0.820	0.864	0.781	0.746	0.696
Variance	0.716	0.672	0.747	0.610	0.557	0.485
Range	3	3	3	3	3	2.80
Minimum	2	2	2	2	2	2.20
Maximum	5	5	5	5	5	5.00

Descriptive data on Intention to Use for Information, which includes five indicators related to the intention to use digital security technology. In general, the average of all indicators is 3.90, with a median and mode of 4.00, indicating a fairly high level of agreement among respondents.

The indicator with the highest average is attention to the use of digital security technology for education (3.98), while other indicators, such as commitment to using technology (3.97) and sharing benefits with others (3.91), also reflect a good level of agreement. The standard deviation ranged from 0.715 to 0.908, indicating a moderate spread of responses, with the majority of respondents tending to agree on the importance of using digital security technology.

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Table 6
Descriptive Data on Intention to Use for Information

	ITUFI1	ITUFI2	ITUFI3	ITUFI4	ITUFI5	AVE ITUFI
N	91	91	91	91	91	91
Missing	0	0	0	0	0	0
Mean	3.77	3.97	3.91	3.86	3.98	3.90
Median	4	4	4	4	4	4.00
Mode	4.00	4.00	4.00	4.00	4.00	4.00
Sum	343	361	356	351	362	355
Standard Deviation	0.908	0.836	0.784	0.783	0.715	0.660
Variance	0.824	0.699	0.614	0.613	0.511	0.436
Range	4	4	3	3	2	2.40
Minimum	1	1	2	2	3	2.60
Maximum	5	5	5	5	5	5.00

The average Intention to Use for Interaction indicator is 3.81 with a median and mode of 4, indicating a fairly high level of agreement among respondents. The highest indicator is the need to use digital security technology to review personal security (3.99), while the lowest indicator is ease of use (3.66), reflecting some challenges. A moderate standard deviation (0.742–0.872) indicates diversity of views, but overall, respondents agree that interaction with digital security technology is fairly simple and supports educational and personal security goals.

Table 7
Descriptive Data Table on Intention to Use for Interaction

	PT1	PT2	PT3	PT4	PT5	PT6	AVE PT
N	91	91	91	91	91	91	91
Missing	0	0	0	0	0	0	0
Mean	3.84	3.99	3.87	3.78	3.66	3.71	3.81
Median	4	4	4	4	4	4	4.00
Mode	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Sum	349	363	352	344	333	338	347
Standard Deviation	0.847	0.796	0.872	0.742	0.806	0.793	0.631
Variance	0.717	0.633	0.760	0.551	0.649	0.629	0.399
Range	4	3	4	3	3	4	2.83
Minimum	1	2	1	2	2	1	2.17
Maximum	5	5	5	5	5	5	5.00

The analysis results show that respondents have high motivation and positive behavior towards the use of digital security technology. The average score for the Motivation and Behavior (MB) variable is 3.97, with a low standard deviation reflecting consistency in responses. Respondents showed high awareness and confidence in the need for digital security technology, with the highest indicator being awareness of the importance of protecting personal data. In addition, the Perceived Trust (PT) construct analysis indicated a good level of trust in digital technology security, supported by the role of the government, with an overall average of 3.71.

In Electronic Word of Mouth (eWOM), the average score of 3.58 indicates that respondents consider information from eWOM useful in encouraging the adoption of security technology. This finding is reinforced by data on the Actual Use and Intention to Use constructs, which show averages of 3.98 and 3.90, respectively, indicating strong acceptance and intention to use digital security technology in various contexts, especially education [7],[26].

The analysis results show that the Actual Use variable has the highest average (3.98), indicating high student confidence in the benefits of digital security technology in protecting data [25]. Followed by Motivation and Behavior (3.97), which reflects the positive motivation and behavior of students [23]. The Perceived Trust variable (3.71) indicates good trust in this technology [24], while eWOM has a lower average (3.58), indicating that online information still plays a less dominant role in encouraging the adoption of digital security technology [25].

CONCLUSION

This study shows that students in Indonesia have a high awareness of the importance of digital security technology in higher education. This is reflected in their strong motivation, positive behavior, and belief in the effectiveness of digital security technology supported by the government. Factors such as motivation, behavior, and belief significantly influence

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the intention and use of this technology. This study contributes theoretically to the literature on the adoption of digital security technology and offers practical insights to support security policies in the education sector.

However, this study has several limitations. Its focus on students in Indonesia makes the results less generalizable globally. The cross-sectional design only describes the situation at a specific point in time, so it does not reflect the dynamics of changing perceptions. The relatively small number of respondents and the dominance of early semester students are also limitations, as is the focus on six variables, which may overlook other factors such as culture and technological infrastructure.

For further research, it is recommended to use a longitudinal design to understand changes in student perceptions over time. Research with a broader and more diverse sample can improve the generalization of results. In addition, exploration of other variables such as culture, social environment, or technological infrastructure can provide deeper insights. Comparative studies with students in other countries are also relevant to see the influence of geographical context. Experimental research to evaluate digital literacy programs and cybersecurity training can help develop strategies to effectively increase awareness and use of digital security technologies.

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