

The Mediating Role of Digital Literacy on the Relationship Between Motivation to Learn and Cybersecurity Awareness

Eclarinal, Baby Jane C.¹, Abongan, Lyka, A.¹, Amar, Relien Kate M.¹, Bagatnan, Arjie¹, Bije, Windy May¹, Cruda, Deo Jev¹, Domingo, Jean Irish¹, Guillen, Juri¹, Loguiber, Jovely¹, Reyes, Jharen Carl¹, Rojo, Cherry Rose¹, Urmenita, Dave Raniel¹, Venturina, Jayson¹, Anna Marie O. Pelandas², PhD (CAR), Jocel T. Labadan², MAEd

¹Department of Education, Senior High School Students, Philippines

²Department of Education, Senior High School Teachers Division of Davao de Oro

DOI: <https://doi.org/10.47772/IJRISS.2026.10200267>

Received: 18 February 2026; Accepted: 23 February 2026; Published: 05 March 2026

ABSTRACT

This study dealt with the mediating role of digital literacy on the relationship between motivation to learn and cybersecurity awareness among senior high school students. The primary goal of this study was to examine the level of motivation to learn, digital literacy, and cybersecurity awareness in terms of their respective indicators; determine the significant relationships between variables; identify which domains of motivation to learn significantly influence cybersecurity awareness; and assess the mediating effect of digital literacy on the relationship between motivation to learn and cybersecurity awareness. A quantitative, descriptive–correlational design was used in this study, which involved 136 Computer System Servicing (CSS) students from Lorenzo S. Sarmiento Sr. National High School. The statistical methods employed were the average weighted mean, Pearson r , multiple regression analysis, and mediation analysis. The findings revealed that the three variables obtained a high level overall. Moreover, there were significant relationships between motivation to learn and cybersecurity awareness, motivation to learn and digital literacy, and digital literacy and cybersecurity awareness. Further, control of learning beliefs and self-efficacy significantly influenced cybersecurity awareness. Mediation analysis also confirmed that digital literacy significantly mediated the relationship between motivation to learn and cybersecurity awareness.

Keywords: Computer System Servicing, Motivation to Learn, Digital Literacy, Cybersecurity Awareness, Philippines

INTRODUCTION

Cybersecurity awareness encompasses an individual's knowledge and understanding of cybersecurity issues, particularly the identification of risks and the adoption of effective protective measures (Zwilling, 2020). In the Netherlands, a study by Prümmer et al. (2023) revealed that cybersecurity awareness remained a pressing challenge, as cyberattacks continued to inflict significant financial losses, undermine productivity, and damage organizational reputations. Similarly, in China, a university-wide assessment found that undergraduate students had low levels of cybersecurity knowledge, weak password management habits, and inadequate trust-related judgment, collectively indicating poor cybersecurity awareness (Du & Chintakovid, 2023). Additionally, Raju et al. (2022) found that many Malaysian students still engaged in risky behaviors, such as sharing passwords, visiting unknown websites, and neglecting personal information security, which compromised overall cybersecurity.

In the Philippine setting, motivation to learn was a vital component of students' academic engagement, persistence, and overall achievement, shaping how they approached learning tasks and responded to academic challenges (Calo & Salvaña, 2024). Patierez (2024) emphasized the importance of fostering motivated learners to strengthen educational outcomes and support the country's long-term development in a knowledge-driven society. When students were highly motivated, they demonstrated greater participation in learning activities,

stronger self-regulation, and increased readiness to acquire complex skills essential to academic and career success (Idulsa & Luzano, 2024). Furthermore, El Ouaddane et al. (2025) reported that motivation to learn contributed to the development of digital literacy and responsible online behavior. Motivated learners were also more likely to engage proactively with technology, seek information, and enhance their cybersecurity awareness by recognizing and responding to online risks (Generalao & Dabatos, 2024).

In Mindanao, particularly in Ozamiz City, many learners lacked sufficient understanding of online threats and appropriate protective measures, leaving them vulnerable to risks such as phishing, data breaches, and identity theft (Toso et al., 2023). Similarly, Booc et al. (2024) revealed that students in Davao City faced increasing cyber threats but possessed limited knowledge of protective measures, leaving them vulnerable to attacks. In Davao de Oro, insufficient cybersecurity awareness endangered not only individual students but also compromised the security of digital platforms accessed for academic and personal purposes (Alejandrino, 2025). A similar problem was observed in the Municipality of Mawab, specifically at Lorenzo S. Sarmiento Sr. National High School, where students continued to use digital platforms despite limited knowledge of cybersecurity vulnerabilities.

Recent empirical studies underscore the critical mediating role of digital literacy on the relationship between motivation to learn and cybersecurity awareness. As Ismaeel (2025) demonstrated, digital literacy significantly enhances preventive behaviors against cybercrime and reduces victimization, thereby supporting the development of cybersecurity awareness among social media users in Saudi Arabia. Complementing this, Kim et al. (2024) found that students with higher digital literacy, combined with parental mediation, engage in safer online practices, indicating that the motivation to acquire digital skills strengthens cybersecurity awareness. Additionally, Chibunna (2025) proposed an integrative framework emphasizing digital literacy, cybersecurity education, and mentorship to empower marginalized groups, suggesting that digital literacy simultaneously promotes motivation and awareness. Moreover, Saritepeci et al. (2024) modeled digital literacy as a key determinant of digital data security awareness, confirming its mediating role between learning motivation and cybersecurity knowledge.

However, no local study has been conducted at Lorenzo S. Sarmiento Sr. National High School that examines the role of digital literacy in the relationship between motivation to learn and cybersecurity awareness. This research seeks to address this gap by investigating the relationship between students' motivation to learn, their level of digital literacy, and their cybersecurity awareness. Specifically, it aims to promote safer online practices, strengthen awareness of digital risks, and foster responsible digital behavior among students and educators. Additionally, the growing threat of cybercrime highlights the need to equip learners with both motivation and digital literacy to ensure their safety in an increasingly digital world. This was crucial to addressing the needs of students in Lorenzo S. Sarmiento Sr. National High School.

Research Objectives

1. To determine the level of motivation to learn among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School in terms of:

1.1 intrinsic goal orientation;

1.2 extrinsic goal orientation;

1.3 control of learning beliefs;

1.4 self-efficacy;

1.5 test anxiety;

1.6 class context; and

1.7 social engagement.

2. To find out the level of digital literacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School in terms of:

2.1 copyright;

2.2 citizenship;

2.3 curation;

2.4 connectedness;

2.5 online privacy concern; and

2.6 cybersecurity behavior.

3. To determine the level of cybersecurity awareness among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School in terms of:

3.1 cybersecurity knowledge;

3.2 cybersecurity practices; and

3.3 institutional cybersecurity awareness.

4. To verify the significant relationship between motivation to learn and cybersecurity among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

5. To examine the significant relationship between digital literacy and cybersecurity awareness among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

6. To evaluate the significant relationship between motivation to learn and digital literacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

7. To identify which of the domains of motivation to learn would significantly influence the cybersecurity awareness among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

8. To determine the mediating effect of digital literacy on the relationship between motivation to learn and cybersecurity awareness among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

METHODOLOGY

This study employed a quantitative, non-experimental, descriptive-correlational research design, as it examined relationships among variables without manipulating or controlling them. This design was appropriate for exploring real-life situations and determining how variables naturally related to one another.

The research was quantitative in nature because it involved the collection and analysis of numerical data using standardized tools (Rana et al., 2021). The study adopted this design by utilizing structured questionnaires to obtain measurable information from senior high school students. All variables were measured through standardized instruments administered using Likert scales. The collected data were analyzed using statistical tools and were interpreted accordingly.

Moreover, the study employed descriptive research, which involved the systematic gathering and presentation of data to clearly describe the characteristics, conditions, or behaviors of the variables (Ghanad, 2023). Its primary purpose was to observe, document, and report what currently existed. In this study, a descriptive design was used, with structured questionnaires distributed to collect numerical data on students' cybersecurity

awareness, motivation to learn, and digital literacy. Descriptive statistics, such as mean and standard deviation, were used to analyze the collected data and summarize students' profiles based on the identified variables.

Population and Sample

The study focused solely on senior high school students who were officially enrolled at Lorenzo S. Sarmiento Sr. National High School in the first semester of the 2025–2026 school year, specifically those in Grade 11 and 12 under the Computer System Servicing strand, including both male and female learners. Stratified random sampling was employed to select respondents, and the Raosoft Sample Size Calculator was used to determine the sample size. According to Siswadi et al. (2023), a sample size of 100–200 respondents was considered a minimum ratio. From the senior high school population of 209 students, a random sample of 136 respondents was selected.

Statistical Tools

The statistical tools used for data analysis and interpretation include the following:

Mean. This was utilized to assess the level of students' cybersecurity awareness, motivation to learn and digital literacy of computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

Pearson (r). This was applied to evaluate the significance of the relationship between motivation to learn and digital literacy, motivation to learn and cybersecurity awareness, and digital literacy and cybersecurity awareness of computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

Mediation Analysis. This statistical tool was used to determine the mediating effect of digital literacy on the relationship of motivation to learn and cybersecurity awareness of computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

Multiple regression analysis. This was employed to examine the influence of motivation to learn and digital literacy as predictors of the cybersecurity awareness of computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.

RESULTS

Level of Motivation to Learn

As presented in Table 1, the level of motivation to learn across seven indicators: intrinsic goal orientation, extrinsic goal orientation, control of learning beliefs, self-efficacy, test anxiety, class context, and social engagement. The overall mean score of 3.82 was categorized as high, with a standard deviation of 0.44, suggesting that the computer system serving students is highly motivated to learn. The cited overall mean score was the result obtained from the following computed mean scores from highest to lowest: 4.10 or high for extrinsic goal orientation with a standard deviation of 0.69; 3.99 or high for control of learning beliefs with a standard deviation of 0.64; 3.93 or high for intrinsic goal orientation with a standard deviation of 0.63; 3.79 or high for test anxiety with a standard deviation of 0.72; 3.75 or high for self-efficacy with a standard deviation of 0.61; 3.64 or high for class context with a standard deviation of 0.55; and 3.53 or high for social engagement with a standard deviation of 0.60.

Table 1. Level of Motivation to Learn

Indicators	Mean	SD	Descriptive Equivalent
Intrinsic Goal Orientation	3.93	0.63	High
Extrinsic Goal Orientation	4.10	0.69	High

Control of Learning Beliefs	3.99	0.64	High
Self-Efficacy	3.75	0.61	High
Test Anxiety	3.79	0.72	High
Class Context	3.64	0.55	High
Social Cognitive	3.53	0.60	High
Overall	3.82	0.44	High

Level of Digital Literacy

As shown in Table 2, digital literacy is measured across six indicators: copyright, citizenship, curation, connectedness, online privacy concerns, and cybersecurity behavior. The overall mean score of 3.85 was categorized as high, with a standard deviation of 0.51, suggesting that the computer system serving students demonstrates strong digital literacy.

Table 2. Level of Digital Literacy

Indicators	Mean	SD	Descriptive Equivalent
Copyright	3.87	0.72	High
Citizenship	4.09	0.73	High
Curation	4.01	0.66	High
Connectedness	3.52	0.78	High
Online Privacy Concerns	3.62	0.64	High
Cybersecurity Behavior	4.01	0.64	High
Overall	3.85	0.51	High

The cited overall mean score was the result obtained from the following computed mean scores from highest to lowest: 4.09 or high for citizenship with a standard deviation of 0.73; 4.01 or high for curation with a standard deviation of 0.66; 4.01 or high for cybersecurity behaviors with a standard deviation of 0.64; 3.87 or high for copyright with a standard deviation of 0.72; 3.62 or high for online privacy concerns with a standard deviation of 0.64; and 3.52 or high for connectedness with a standard deviation of 0.78.

Level of Cybersecurity Awareness

As illustrated in Table 3, the level of cybersecurity awareness across three indicators: cybersecurity knowledge, cybersecurity practices, and institutional cybersecurity awareness and support. The overall mean score of 3.86 was categorized as high, with a standard deviation of 0.55, indicating that students who receive computer system servicing hold positive cybersecurity awareness. The cited overall mean score was the result obtained from the following computed mean scores from highest to lowest: 3.98 or high for cybersecurity practices with a standard deviation of 0.68; 3.98 or high for cybersecurity knowledge with a standard deviation of 0.63; and 3.64 or high for institutional cybersecurity awareness and support with a standard deviation of 0.77.

Table 3. Level of Cybersecurity Awareness

Indicators	Mean	SD	Descriptive Equivalent
Cybersecurity Knowledge	3.98	0.63	High
Cybersecurity Practices	3.98	0.68	High
Institutional Cybersecurity Awareness and Support	3.64	0.77	High
Overall	3.86	0.55	High

Significance of the Relationship Between Motivation to Learn and Cybersecurity Awareness

One crucial purpose of this study is to determine whether motivation to learn has a significant relationship with cybersecurity awareness among computer system servicing students. The Shapiro-Wilk Test for Bivariate Normality has a p- value of 0.288, indicating that the distribution is normal. Hence, a parametric test, Pearson's correlation, is suited for this distribution.

As revealed in Table 4, motivation to learn was significantly related to cybersecurity awareness. This result is due to a p-value of <.001, which is less than the 0.05 level of significance. Hence, the decision was made to reject the null hypothesis, which stated that there is no significant relationship between motivation to learn and cybersecurity awareness. Moreover, Pearson's r value of 0.640* further indicates a moderate positive correlation and implies that as motivation to learn increases, students' cybersecurity awareness tends to increase.

Table 4. Significance of the Relationship Between Motivation to Learn and Cybersecurity Awareness

	Pearson's r	p
Motivation to Learn—Cybersecurity Awareness	0.640*	<.001

*significant at the 0.05 level of significance

Significance of the Relationship Between Digital Literacy and Cybersecurity Awareness

Another crucial purpose of this study is to determine whether digital literacy has a significant relationship with cybersecurity awareness among computer system servicing students. The Shapiro-Wilk Test for Bivariate Normality has a p-value of 0.900, indicating that the distribution is normal. Hence, a parametric test, Pearson's correlation, is suited for this distribution.

As demonstrated in Table 5, there is a significant relationship between digital literacy and cybersecurity awareness. This finding is supported by a p-value of less than <.001, which is below the 0.05 threshold for significance. As a result, the decision was made to reject the null hypothesis that there is no significant relationship between digital literacy and cybersecurity awareness. Furthermore, Pearson's r value of 0.721* indicates a strong positive correlation, suggesting that as digital literacy increases, students' cybersecurity awareness tends to improve.

Table 5. Significance of the Relationship Between Digital Literacy and Cybersecurity Awareness

	Pearson's r	p
Digital Literacy—Cybersecurity Awareness	0.721*	<.001

*significant at the 0.05 level of significance

Significance of the Relationship Between Motivation to Learn and Digital Literacy

A vital aim of this research is to evaluate whether there is a significant correlation between digital literacy and motivation to learn among computer system servicing students. The Shapiro-Wilk Test for Bivariate Normality presents a p-value of 0.877, suggesting that the distribution follows a normal pattern. Consequently, a parametric test, specifically, Pearson’s r correlation, is appropriate for this distribution.

As revealed in Table 6, motivation to learn posed a significant relationship with digital literacy. This result is due to a p-value of <.001, less than the 0.05 level of significance. Hence, this led to the decision that the null hypothesis stating there is no significant relationship between motivation to learn and digital literacy, is rejected. Moreover, Pearson’s r value of 0.770* further indicates a strong positive correlation, suggesting that as motivation to learn increases, digital literacy tends to increase.

Table 6. Significance of the Relationship Between Digital Literacy and Cybersecurity Awareness

	Pearson’s r	p
Motivation to Learn—Digital Literacy	0.770*	<.001

*significant at the 0.05 level of significance

Significance of the Influence of the Domains of Motivation to Learn on Cybersecurity Awareness

The data shown in Table 7 are from a regression analysis testing the significant influence of motivation to learn on cybersecurity awareness. Using Linear Regression Analysis, the data revealed that the influence of motivation to learn on cybersecurity awareness among computer system students has an F-value of 11.09 and a corresponding p-value of <.001, indicating significance. This means that motivation to learn influences cybersecurity awareness, as the probability value is less than the 0.05 significance level. The coefficient of determination (R^2) of 0.458 indicates that 45.80% of the variation in cybersecurity awareness is explained by motivation to learn, while the remaining 54.20% is explained by other factors not included in the study.

Table 7. Significance of the Influence of the Domains of Motivation to Learn on Cybersecurity Awareness

Motivation to Learn	Coefficients	t	p	Decision $\alpha=0.05$
Intrinsic Goal Orientation	0.090	1.075	0.285	H_0 is not rejected
Extrinsic Goal Orientation	-0.019	-0.242	0.810	H_0 is not rejected
Control of Learning Beliefs	0.178*	2.099	0.039	H_0 is rejected
Self-efficacy	0.290*	3.018	0.003	H_0 is rejected
Test Anxiety	0.037	0.533	0.595	H_0 is not rejected

Class Context	0.180	1.653	1.653	H ₀ is not rejected
Social Engagement	0.065	0.717	0.717	H ₀ is not rejected
Dependent Variable: Cybersecurity Awareness				

p < 0.05 R= 0.677 R²=0.458 F= 11.09 p-value < 0.001

The Mediating Effect of Digital Literacy on the Relationship between Motivation to Learn and Cybersecurity Awareness

The data shown in Table 8 are the indirect effects of digital literacy on the relationship between motivation to learn and cybersecurity awareness. As presented, through digital literacy, motivation to learn influences cybersecurity awareness, as evidenced by a positive, significant indirect effect of 0.573 (p<.001). Further, this indicates that digital literacy mediates the relationship between motivation to learn and cybersecurity awareness.

Table 8. The Mediating Effect of Digital Literacy on the Relationship Between Motivation to Learn and Cybersecurity Awareness

	Estimate	p
Motivation to Learn-Digital Literacy-Cybersecurity Awareness	0.573	<.001

*significant at the 0.05 level of significance

DISCUSSION

Level of Motivation to Learn

In the preceding chapter, the findings regarding the motivation to learn of CSS students in Lorenzo S. Sarmiento Sr. National High School were presented. It revealed that the level of motivation to learn was reported to be high, suggesting that CSS senior high school students possess positive motivation to learn. This entails that students are highly motivated to engage in learning activities, demonstrate enthusiasm for their specialization, and show readiness to develop the skills and knowledge required for computer system servicing. This implies that educators can effectively harness such a high level of motivation to further enhance students' academic performance and competency, particularly in technology and cybersecurity.

The findings align with the study of Wentzel (2020), who noted that students tend to maintain high motivation when academic expectations and learning environments support their goals. This is in connection to the results of Howard et al (2021), who noted that students generally possess strong drive, confidence, and positive learning attitudes across the different aspects of motivation measured. Likewise, it is consistent with Schunk and Dibenedetto (2021), who emphasized that motivated learners believe in their capacity to succeed and take responsibility for their learning progress. The results also align with Murayama (2022), who found that high motivation among students is often fueled by a combination of internal interest and external reinforcement. Moreover, these results align with the findings of Huang and Yuang (2021), who found that a high level of motivation to learn is reflected in being positively engaged in learning, holding productive beliefs and attitudes that enable persistence, actively participating in class, and working toward academic success.

Level of Digital Literacy

In the previous chapter, the study reported the level of digital literacy of students in computer system servicing at Lorenzo S. Sarmiento Sr. National High School. It revealed that digital literacy was described as high. This means students are generally proficient in using digital tools, accessing information effectively, and applying technology to their academic tasks. This implies that such a high level of digital literacy provides a strong foundation for advanced learning, particularly in technical subjects and in promoting cybersecurity awareness.

The findings align with the study of Yeşilyurt and Vezne (2023), who found that modern learners generally demonstrate strong digital literacy due to their constant exposure to technology. Similarly, the findings support the study of Nikou and Aavakare (2021) who noted that students today exhibit responsible digital citizenship and effective information curation skills. Moreover, this result aligns with Helsper and Smahel (2020), who highlighted that students increasingly practice responsible cybersecurity behaviors.

Level of Cybersecurity Awareness

The previous study presents the level of computer system support for students' cybersecurity awareness. It revealed that students' cybersecurity awareness was high. This indicates that the students are well-informed about cybersecurity threats and demonstrate appropriate practices in maintaining digital safety and security. This implies that their high level of awareness can help protect them from cyber risks and supports the effectiveness of existing cybersecurity education and digital literacy initiatives in the school.

This finding aligns with the study by Qusa and Tarazi (2021), who noted that students today generally possess strong cybersecurity awareness as a result of their increased engagement with digital technologies. Likewise, the results support the claims of Özer et al. (2024), who stated that learners tend to adopt responsible cybersecurity practices, particularly in managing passwords and safeguarding their accounts. This consistency is further reflected in the work of Becirovic (2023), who reported that students actively engage in protecting their personal information and digital devices. The findings are similar to those of Alqahtani (2023), who stated that although students display considerable individual competence, institutional initiatives and communication on cybersecurity issues still have room for improvement to fully support learners' needs.

Significance of the Relationship Between Motivation to Learn and Cybersecurity Awareness

The study revealed a noteworthy relationship between motivation to learn and cybersecurity awareness. This entails that motivated students are more engaged in acquiring knowledge, more attentive to digital safety guidelines, and more proactive in recognizing and addressing cybersecurity threats. This implies that schools should implement strategies that enhance students' learning motivation, as this can lead to improved cybersecurity awareness and more responsible use of digital technologies.

The findings support the work of Eccles and Wigfield (2020) who explained that students who value learning tasks and believe in their capability are more engaged, which supports their understanding of complex topics such as cybersecurity. Similarly, this result is consistent with Zimmerman (2020) who emphasized that motivated learners exhibit stronger self-regulated learning behaviors, enabling them to monitor their online activities and reduce exposure to cyber risks. Moreover, this consistency is further reflected in the work of Bada and Nurse (2020) highlighted that individuals who are motivated to learn are more receptive to cybersecurity education initiatives, leading to improved awareness and safer digital behavior.

Significance of the Relationship Between Digital Literacy and Cybersecurity Awareness

The study revealed a noteworthy relationship between digital literacy and cybersecurity awareness. The correlation entails that as the level of digital literacy among computer system servicing students increases, their awareness and understanding of cybersecurity threats and safe online practices also improve. This implies that strengthening digital literacy instruction in the curriculum can be an effective strategy to enhance students' cybersecurity awareness and reduce their vulnerability to cyber risks.

This result is consistent with the findings of Elrayah and Jamil (2023), who emphasized that digital literacy encompasses not only technical skills but also the ability to critically evaluate and manage digital information, which is essential for cybersecurity. Similarly, this is in connection with the results of Yuliana (2022) who found

that learners who are digitally competent tend to demonstrate responsible and proper engagement online, including awareness of security risks and protective measures. Also, the finding supports the study of Saritepeci et al. (2024), enhancing students' digital literacy can directly contribute to their ability to recognize, prevent, and respond to cybersecurity threats effectively.

Significance of the Relationship Between Motivation to Learn and Digital Literacy

The study's results unveiled a significant relationship between digital literacy and motivation to learn. The p-value indicated a correlation between these two variables. This means that students with higher levels of digital literacy tend to be more motivated to learn, as their confidence and competence with digital tools enhance their engagement in the learning process. This implies that improving students' digital literacy can positively influence their motivation to learn and support more effective and meaningful learning experiences.

The finding aligns with the study by Kholid and Darmawan (2023), which asserted that students with higher digital competencies tend to exhibit greater drive and engagement in their learning. Furthermore, this result aligns with Kim and Ryoo (2023), who emphasized that digital literacy enhances learners' confidence and autonomy in navigating information, thereby stimulating motivation. Similarly, the finding supports the study of Pala and Başbüyük (2023), which asserted that students who are proficient in digital skills are more likely to engage actively with learning tasks and pursue knowledge with purpose.

Significance of the Influence of the Domains of Motivation to Learn on Cybersecurity Awareness

The regression analysis investigating the influence of motivation to learn on cybersecurity awareness indicates that two out of seven domains, namely control of learning beliefs and self-efficacy, have a significant impact on students' cybersecurity awareness. On the other hand, intrinsic goal orientation, extrinsic goal orientation, test anxiety, class context, and social engagement were found to be insignificant in influencing students' learning engagement. This means that students with stronger beliefs in their ability to control their learning and greater self-efficacy tend to demonstrate higher levels of cybersecurity awareness. This implies that educational interventions should focus on enhancing students' confidence and sense of responsibility for their own learning to effectively improve cybersecurity awareness.

The finding supports the study of Schunk and DiBenedetto (2021), that learners who are confident in their abilities and feel in control of their learning are more likely to engage in behaviors that enhance their skills and knowledge, including those related to cybersecurity. Similarly, this result aligns to the work of Oroni and Xiangping (2025) who notes that motivated learners tend to adopt proactive approaches to learning, which can extend to understanding and applying cybersecurity measures. More so, this is in connection with the results of Kam et al. (2020) who reported that motivation to learn had a direct positive influence on cybersecurity awareness.

The Mediating Effect of Digital Literacy on the Relationship Between Motivation to Learn and Cybersecurity Awareness

The respondents of Lorenzo S. Sarmiento sr. National High School computer system servicing student's digital literacy exhibit an indirect effect in the relationship between motivation to learn and cybersecurity awareness. The findings indicate that motivation to learn positively influences cybersecurity awareness when students possess adequate digital literacy skills. Digital literacy enables learners to critically evaluate digital information, recognize online risks, and apply appropriate safety measures. Without sufficient digital literacy, motivation to learn alone may not effectively translate into heightened cybersecurity awareness.

The findings affirm with the work of Van Laar et al. (2020) who suggested that digital literacy allow learners to transform their motivation to learn into effective and responsible digital behavior. This is consistent with the findings of Fallon (2020), who emphasized that digital literacy supports meaningful learning engagement and responsible technology use. Similarly, the finding supports the Organisation for Economic Co-operation and Development (OECD, 2021), which highlighted that digital literacy equips learners with the competencies needed to make informed decisions and behave safely in digital environments. In the same vein, the finding is

also the same with UNESCO (2021), which stressed that digital literacy empowers learners to use digital technologies ethically and responsibly, thereby enhancing cybersecurity awareness.

CONCLUSION

The study concludes that the level of motivation to learn, digital literacy, and cybersecurity among senior high school Computer System Servicing students is high. The findings further revealed positive and significant relationships among motivation to learn and cybersecurity awareness, digital literacy and cybersecurity awareness, and motivation to learn and digital literacy. In addition, motivation to learn significantly influences cybersecurity awareness. Specifically, there are two domains of motivation to learn: the control of learning beliefs and self-efficacy, which significantly predict the cybersecurity awareness of senior high school students. Lastly, there is a significant indirect effect of motivation to learn on cybersecurity awareness through digital literacy, concluding that digital literacy significantly mediates the relationship between motivation to learn and cybersecurity awareness.

REFERENCES

1. Alejandrino, A. B. (2025). AN ANALYSIS OF STATE UNIVERSITIES AND COLLEGES STUDENT'S LEVEL OF AWARENESS ON DIGITAL FOOTPRINTS AND DATA PRIVACY IN DAVAO REGION, PHILIPPINES. *European Journal of Education Studies*, 12(4).
2. Alqahtani, M. A. (2022). Factors affecting cybersecurity awareness among university students. *Applied Sciences*, 12(5), 2589.
3. Bada, M., & Nurse, J. R. C. (2020). Developing cybersecurity education and awareness programmes for SMEs. *Computers & Security*, 92, 101701. <https://doi.org/10.1016/j.cose.2019.101701>
4. Bećirović, S. (2023). Privacy and personal data protection in digital pedagogy. In *Digital pedagogy: The use of digital technologies in contemporary education* (pp. 83-96). Singapore: Springer Nature Singapore.
5. Booc, N. B. B., Budiongan, K., & Carballo, R. (2024). Cybersecurity Awareness, and Cybersecurity Behavior of High School Students in Davao City: A Mediation Role of Perceived Behavioral Control. *European Journal of Applied Science, Engineering and Technology*, 2(3), 4-9.
6. Calo, W. & Salvaña, R. (2024) Academic Motivation, Resilience and Achievement of Junior High School Learners in Alternative Learning System (ALS): A Structural Equation Modeling Analysis doi: 10.51244/IJRSI.2024.1107079
7. Chibunna, K. (2025). Building digital literacy and cybersecurity awareness to empower underrepresented groups. *All Multidisciplinary Journal*, 2(160), 1–12.
8. Du, X., & Chintakovid, T. (2023). A survey of cybersecurity awareness among undergraduate students at Yunnan University of Finance and Economics in China. Atlantis Press.
9. Eccles, J. S., & Wigfield, A. (2020). Expectancy–value theory. *Contemporary Educational Psychology*, 61, 101832.
10. El Ouaddane, K., El Morabit, N., Oumaira, I., & Chekour, M. (2025). The Impact of Digital Skills on University Students' Motivation: A Systematic Review. *Educational Process: International Journal*, 17, e2025384.
11. Elrayah, M., & Jamil, S. (2023). Impact of digital literacy and online privacy concerns on cybersecurity behaviour: The moderating role of cybersecurity awareness. *International Journal of Cyber Criminology*, 17(2), 166-187
12. Falloon G.(2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68(3), 1–25. <https://doi.org/10.1007/s11423-020-09767-4>
13. Generalao, W. J. E., & Dabatos, H. M. D. (2024). Student's Technology Literacy Skills and Level of Motivation in Relation to their Online Learning Behavior. *European Online Journal of Natural and Social Sciences*, 13(2), pp-105.
14. Ghanad, A. (2023). An overview of quantitative research methods. *International journal of multidisciplinary research and analysis*, 6(08), 3794-3803.
15. Helsper, E. J., & Smahel, D. (2020). Excessive internet use by young Europeans: psychological vulnerability and digital literacy?. *Information, communication & society*, 23(9), 1255-1273.

16. Howard, J. L., Bureau, J., Guay, F., Chong, J. X., & Ryan, R. M. (2021). Student motivation and associated outcomes: A meta-analysis from self-determination theory. *Perspectives on Psychological Science*, 16(6), 1300-1323. doi: 10.1016/j.cose.2019.101701
17. Huang, C., Yang, Y., (2022). Research on the Relationships Among Learning Motivation, Learning Engagement, and Learning Effectiveness. *The Educational Review, USA*, 5(6), 182-190. doi: 10.26855/er.2021.06.004
18. Idulsa, F. L., & Luzano, R. A. (2024). Students' motivation and academic engagement in Alternative Learning System. *International Journal of Multidisciplinary Research and Analysis*, 7(3), 1019-1032.
19. Ismaeel, S. (2025). The impact of digital literacy on cybercrime awareness, victimization, and prevention measures: A study of cyberbullying in Saudi Arabia. *Palawan Journal of Criminology*, 17(1), 77–96. <https://doi.org/10.62271/pjc.171.77.96>
20. Kam, C. C., Menard, P., Ormond, D., Crossler R. E., (2020). Cultivating cybersecurity learning: An integration of self-determination and flow. *Computers & Security*, 96, 101875
21. Kholid, K., & Darmawan, D. (2023). The influence of digital literacy and learning media utilization on student learning motivation. *Fitrah: Journal of Islamic Education*, 4(2), 393-403.
22. Kim, S., Lee, H., Park, J., & Choi, Y. (2024). The role of digital literacy and parental mediation in online security behaviors and e-payment adoption. *International Journal of Information Management Data Insights*, 4(2), 100234. <https://doi.org/10.1016/j.ijime.2024.100234>
23. Kim, D., & Ryoo, D. (2023). Learning techniques using study with me: focus on motivational orientations, learning competency, and digital literacy. *IEEE Access*, 11, 98050-98058.
24. Murayama, K. (2022). A reward-learning framework of knowledge acquisition: An integrated account of curiosity, interest, and intrinsic–extrinsic rewards. *Psychological Review*, 129(1), 175.
25. Nikou, S., & Aavakare, M. (2021). An assessment of the interplay between literacy and digital Technology in Higher Education. *Education and Information Technologies*, 26(4), 3893-3915.
26. Organisation for Economic Co-operation and Development. (2021). *OECD skills outlook 2021: Learning for life*. OECD Publishing. <https://doi.org/10.1787/0ae365b4-en>
27. Oroni, C. Z., Xiangping, F. (2025). Evaluating the influence of cybersecurity policies and cybersecurity behavior on institutional performance in the remote learning: the moderating role of technological readiness. *Science Direct*, 10, 2666-1888. <https://doi.org/10.1016/j.sftr.2025.101554>
28. Özer Şanal, S., & Çiçek, B. (2024). University students' digital spaces in online learning communities: Implications for understanding, protecting and maintaining privacy. *British Journal of Educational Technology*, 55(2), 654-667.
29. Pala, Ş. M., & Başbüyük, A. (2023). The predictive effect of digital literacy, self-control and motivation on the academic achievement in the science, technology and society learning area. *Technology, Knowledge and Learning*, 28(1), 369-385.
30. Patierez, J. G. (2024). Effects of Learning Motivation and Engagement on the Academic Performance and Satisfaction of Senior High School Students. *Dinkum Journal of Social Innovations*, 3(05), 251-266.
31. Prümmer, J., van Steen, T., & van den Berg, B. (2023). A systematic review of current cybersecurity training methods. *Computers & Security*, 136, 103585. <https://doi.org/10.1016/j.cose.2023.103585>
32. Qusa, H., & Tarazi, J. (2021, January). Cyber-hero: A gamification framework for cyber security awareness for high schools students. In *2021 IEEE 11th annual computing and communication workshop and conference (CCWC)* (pp. 0677-0682). IEEE.
33. Raju, R., Abd Rahman, N. H., & Ahmad, A. (2022). Cyber security awareness in using digital platforms among students in a higher learning institution. *Asian Journal of University Education*, 18(3), 756–766. <https://doi.org/10.24191/ajue.v18i3.18967>
34. Rana, P., Dubey, M. K., Gupta, L. R., & Thakur, A. K. (2021). A model to combine qualitative and quantitative measures in education for better assessment of learning outcomes. *Interactive Learning Environments*, 32(10), 5947-5977.
35. Saritepeci, M. (2024). The role of digital literacy in digital data security awareness: Mediating effects of motivation to learn. *Online Information Review*, 48(5), 983–1001. <https://doi.org/10.1108/OIR-02-2024-1220>
36. Saritepeci, M., Yildiz Durak, H., Özüdoğru, G., & Atman Uslu, N. (2024). The role of digital literacy and digital data security awareness in online privacy concerns: a multi-group analysis with gender. *Online Information Review*, 48(5), 983-1001.

37. Schunk, D. H., & DiBenedetto, M. K. (2021). Self-efficacy and human motivation. In *Advances in motivation science* (Vol. 8, pp. 153-179). Elsevier.
38. Siswadi, Y., Jufrizen, J., Saripuddin, J., Farisi, S., & Sari, M. (2023). Organizational culture and organizational citizenship behavior: The mediating role of learning organizations and organizational commitment. *Jurnal Riset Bisnis Dan Manajemen*, 16(1), 73-82.
39. Toso, C. H. S., Jumalon, A. J. A., Magadan, J. A. R., Alvarico Jr, A. B., & Cuevas, J. F. (2023). Cybercrime Awareness Among Senior High School Students. *Mediterranean Journal of Basic and Applied Sciences (MJBAS)*, 7(2), 160-176.
40. United Nations Educational, Scientific and Cultural Organization. (2021). *Reimagining our futures together: A new social contract for education*. UNESCO.
41. Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2020). Determinants of 21st-century digital skills: A large-scale survey among working professionals. *Computers in Human Behavior*, 100, 93–104. <https://doi.org/10.1016/j.chb.2019.06.017>
42. Wentzel, K. (2020). *Motivating students to learn*. Routledge.
43. Yeşilyurt, E., & Vezne, R. (2023). Digital literacy, technological literacy, and internet literacy as predictors of attitude toward applying computer-supported education. *Education and information technologies*, 28(8), 9885-9911.
44. Yuliana, Y. (2022). The importance of cybersecurity awareness for children. *Lampung Journal of International Law*, 4(1), 39-46.
45. Zimmerman, B. J. (2020). Self-regulated learning and academic achievement. *Educational Psychologist*, 55(3), 135–153.
46. Zwilling, M., Klien, G., Lesjak, D., Wiechetek, Ł., Çetin, F., & Basim, H. N. (2020). Cyber security awareness, knowledge and behavior: A comparative study. *Journal of Computer Information Systems*, 62(1), 82–97.