Computer Literacy as a Mediator Between Metacognitive Awareness and Computer Self-Efficacy among Learners

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DOI: https://doi.org/10.47772/IJRISS.2026.10200467

Received: 26 February 2026; Accepted: 07 March 2026; Published: 17 March 2026

ABSTRACT

This study examined the mediating effect of computer literacy on the relationship between metacognitive awareness and computer self-efficacy among learners. It investigated the levels of metacognitive awareness, computer literacy, and computer self-efficacy. Furthermore, it assessed the significant relationships among the variables: computer literacy and computer self-efficacy, computer self-efficacy and metacognitive awareness, and computer literacy and metacognitive awareness. The study also explored the role of computer literacy as a mediator in these relationships. A quantitative, non-experimental, descriptive-correlational research design was employed, using a sample of learners selected through stratified random sampling. The statistical tools utilized in the study included the mean, Pearson's (r), mediation analysis, and multiple regression analysis. The findings revealed that the levels of metacognitive awareness, computer literacy, and computer self-efficacy were high. Moreover, all relationships among the variables were found to be statistically significant: metacognitive awareness and computer literacy; computer literacy and computer self-efficacy; and metacognitive awareness and computer self-efficacy. Additionally, the results indicated that computer literacy partially mediated the relationship between computer self-efficacy and metacognitive awareness. These findings suggest that improving computer literacy enhances learners' computer self-efficacy and their skills in using computers.

Keywords: Computer System Servicing, Computer Literacy, Metacognitive Awareness, Computer Self-efficacy, Philippines

INTRODUCTION

Computer self-efficacy has been linked to greater willingness to use technology, greater resilience in the face of adversity, and better performance on computer-related tasks Karaoglan-Yilmaz et al., (2023). However, Jang and Kim (2020) found that Korean students had low computer self-efficacy, resulting in poor research productivity and academic failure because their confidence in completing information-related activities did not match their actual abilities. Similarly, Mirazchiyski (2025) found that many Tanzanian students lack access to ICT resources and an academic support system, resulting in low computer self-efficacy. Additionally, Sadeghi (2021) found that high school students' computer confidence was only moderate to low, making it difficult for them to navigate digital learning platforms effectively.

Metacognitive awareness was essential to students' academic growth in the Philippine educational system because it played a vital role in learners' academic development as it enabled students to deliberately plan, monitor, and evaluate their learning processes, which improved their critical thinking and problem-solving abilities (Magno & Cayado, 2021; Mendoza & Elepeño, 2023). It was found that students who used metacognitive strategies performed better on academic assignments, particularly in environments where technology is crucial. According to Pei et al. (2023), learners who engaged in self-directed learning using metacognitive strategies demonstrated significant improvements in task performance, which, in turn, boosted their confidence in completing digital

tasks. Furthermore, learners with higher levels of metacognitive awareness were more likely to reflect on their learning progress, adjust their strategy when necessary, and persevere in the face of technological challenges (Flavell, 1979; Magno & Cayado 2021).

Hero (2022) emphasized that people, both professionals and students, who gained sufficient computer literacy, such as the ability to navigate software, conduct online research, and perform basic troubleshooting, tended to become more confident in their ability to handle technology-related tasks, which in turn increased their computer self-efficacy. In support of this finding, Higher computer self-efficacy was found to promote perseverance, lower anxiety in digital contexts, and improve overall performance in technology-driven environments (Briones et al., 2023; Cabaron et al., 2024). Furthermore, Zakir et al. (2025) developed computer literacy, improved digital competency, and computer self-efficacy, making individuals more resilient and adaptable in an increasingly technology-reliant society.

In Mindanao, particularly in Cagayan de Oro City, junior high school students reported a moderate computer self-efficacy. Due to limited access to digital devices and inconsistent internet connectivity, they reported a moderate computer self-efficacy, according to Calo (2023). Likewise, a Panabo City study by Çınar (2025) found that the majority of college students had lower levels of computer self-efficacy, as evidenced by their lower motivation and fewer desirable academic outcomes.

In Davao de Oro, recent studies suggested that a considerable number of students continued to experience difficulties in developing strong computer self-efficacy. Sariyatun (2025) reported that many junior and senior high school learners in the province faced limited access to technological resources and unstable internet connections, which negatively affected their ability to perform digital tasks effectively. At Lorenzo S. Sarmiento Sr. National High School, students were still facing various issues that hindered their development of computer self-efficacy. Despite the fact that some studies had already investigated the computer self-efficacy and digital readiness of students in Mindanao, there was no extensive research that had explored different provinces and cities in Region XI As shown in the study of Davao City Cantutay and Taganas (2024), most of the students in senior high school had difficulties in relating their computer self-efficacy to the online platform requirements such as Quipper LMS. Similarly, (Calo 2023; Sariyutan 2024) found that students in Cagayan de Oro and Davao de Oro had low confidence in performing digital tasks due to the limited availability of Information and Communication Technology (ICT) resources and training. On the other hand, the importance of computer literacy to academic achievement was highlighted by Cadiz-Gabejan and Melinda Jr. (2021).

Although the relationship between metacognitive awareness and computer self-efficacy has been investigated in previous studies, the mediating effect of computer literacy has not been fully explored. Most studies considered computer literacy only as a secondary skill or prerequisite, without recognizing its potential as a bridging tool between higher-order cognitive processes and learners' confidence in computer-based tasks. Moreover, most studies were conducted among college students, professionals, or technical fields, thereby overlooking senior high school students, especially those in technical-vocational courses such as Computer Systems Servicing. This study addressed these gaps by examining the mediating role of computer literacy in the relationship between metacognitive awareness and computer self-efficacy among Computer Systems Servicing students at Lorenzo S. Sarmiento Sr. National High School.

Research Objectives

1. To determine the level of metacognitive awareness among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School in terms of:
    1.1 declarative;
    1.2 procedural;
    1.3 conditional;
    1.4 planning;
    1.5 monitoring; and
    1.6 evaluating.
2. To assess the level of computer literacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School in terms of:

2.1-word processing;
2.2 spreadsheet;
2.3 presentation; and
2.4 general computing.

3. To identify the level of computer self-efficacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School in terms of:
3.1 general/beginning activities; and
3.2 advanced activities.
4. To evaluate the significant relationship between metacognitive awareness and computer self-efficacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.
5. To assess the significant relationship between computer literacy and computer self-efficacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.
6. To determine the significant relationship between metacognitive awareness and computer literacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.
7. To identify which domains in metacognitive awareness significantly influence computer self-efficacy among computer system servicing students in Lorenzo S. Sarmiento Sr. National High School.
8. To assess the mediating effect of computer literacy on the relationship between metacognitive awareness and computer self-efficacy 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. This approach did not control for variables but examined how metacognitive awareness, computer literacy, and computer self-efficacy relate to one another in the real world. This study used a quantitative approach to gather numerical data through validated Likert-scale questionnaires Metacognitive Awareness Inventory developed by Schraw and Dennison (1994) was used to measure learners' metacognitive awareness. Computer self-efficacy was measured using the scale developed by Compeau and Higgins (1995). The computer literacy questionnaire was adapted from previous studies assessing students' digital competence. This allowed the researcher to collect measurable, objective data, thereby enabling statistical analyses to assess the relationship between the variables. Also, this study used a quantitative approach, which involves determining the extent or magnitude of phenomena or the relationships or associations between two or more factors (Yuan et al., 2024).

More specifically, a correlational research design was utilized. Pearson correlation and regression was employed to investigate and represent the relationships. For this purpose, mediation analysis was used with bootstrapping or the Sobel test to evaluate whether computer literacy mediates the effect of metacognitive awareness on computer self-efficacy. The method allows researchers to examine the predictive relationships between variables even without manipulating them (Baterna et al., 2020).

Population and Sample

Stratified random sampling was used to select the respondents. The subjects of the study were the 136 students enrolled in the Computer System Servicing (CSS) strand during the first semester of school year 2025–2026 at Lorenzo S. Sarmiento Sr. National High School. The inclusion criteria specified that participants might be male or female and willing to voluntarily participate in the study.

The selection of CSS students ensured that the research study would obtain relevant, valid, and reliable data from respondents who would be actively engaged with technology, thereby helping to gain a better understanding of the challenges they would encounter and the learning outcomes they would acquire. Most importantly, their experiences provided valuable insights into how computer literacy will mediate the relationship between their metacognitive awareness and computer self-efficacy, the key focus of this research study. They engaged in practical exercises such as the assembly and disassembly of computers, the installation and configuration of software, and the troubleshooting of hardware and software issues, which enabled them to gain hands-on experience.

Statistical Tool

The following statistical tools were utilized for data analysis and interpretation.

Mean. This statistical tool was used to determine the levels of metacognitive awareness, computer literacy, and computer self-efficacy among the respondents at Lorenzo S. Sarmiento Sr. National High School in Mawab, Davao de Oro.

Pearson(r). This statistical tool was used to assess the significance and strength of the relationships among metacognitive awareness, computer literacy, and computer self-efficacy.

Multiple Regression Analysis. This statistical tool was used to determine the influence of metacognitive awareness and computer literacy on respondents' computer self-efficacy.

Mediation Analysis. This statistical tool was used to determine the mediating effect of computer literacy on the relationship between respondents' metacognitive awareness and computer self-efficacy.

RESULTS

Level of Metacognitive Awareness

As shown in Table 1the level of metacognitive awareness in terms of declarative, procedural, conditional, planning, monitoring, and evaluation of learners. The overall mean is 3.76, which is described as high, with a standard deviation of 0.42. The elevated level may be explained by respondents' consistently high ratings across all indicators. This implies that the respondents' answers regarding the level of metacognitive awareness are more positive for declarative, procedural, conditional, planning, monitoring, and evaluation of students.

The overall mean score was derived from the computed mean scores arranged from highest to lowest. 3.81 or high for evaluation with a standard deviation of 0.54; 3.80 or high for monitoring with a standard deviation of 0.61; 3.76 or high for procedural with a standard deviation of 0.57; 3.75 or high for conditional with a standard deviation of 0.55; 3.73 or high for planning with a standard deviation of 0.61; and 3.70 or high for declarative with a standard deviation of 0.54.

Table 1. Level of Metacognitive Awareness

Indicators	**Mean**	**SD**	**Descriptive Equivalent**
Declarative	3.70	0.54	High
Procedural	3.76	0.57	High
Conditional	3.75	0.55	High
Planning	3.73	0.61	High
Monitoring	3.80	0.61	High
Evaluation	3.81	0.54	High
Overall	**3.76**	**0.42**	**High**

Level of Computer Literacy

Shown in Table 2 are the mean scores for the indicators of computer literacy, with an overall mean of 3.76 high and a standard deviation of 0.51. The high level may be attributed to respondents' high ratings across most item indicators for word processing, spreadsheets, presentations, and general computing.

Table 2. Level of Computer Literacy

Indicators	**Mean**	**SD**	**Descriptive Equivalent**
Word processing	3.88	0.65	High
Spreadsheet	3.65	0.62	High
Presentation	3.72	0.66	High
General computing	3.72	0.66	High
Overall	**3.76**	**0.51**	**High**

The overall mean score was computed from the ordered mean scores, from highest to lowest. 3.88 or high for word processing with a standard deviation of 0.65; 3.81 or high for general computing with a standard deviation of 0.66; 3.72 or high for presentation with a standard deviation of 0.66; 3.65 or high for spreadsheet with a standard deviation of 0.62.

Level of Computer Self-efficacy

As presented in Table 3, the level of computer self-efficacy is measured in terms of general/beginning activities and advanced activities. The overall mean is 3.76, which is considered high, with a standard deviation of 0.59. The high level can be explained by respondents' high ratings across all indicators.

The cited overall mean score was the result of the following computed mean scores, from highest to lowest: 3.84 (high) for general beginning activities, with a standard deviation of 0.71; and 3.68 (high) for advanced activities, with a standard deviation of 0.67.

Table 3. Level of Computer Self-efficacy

Indicators	**Mean**	**SD**	**Descriptive Equivalent**
General/Beginning Activities	3.84	0.71	High
Advanced Activities	3.68	0.67	High
Overall	**3.76**	**0.59**	**High**

Significance of the Relationship Between Metacognitive Awareness and Computer Self-efficacy

The first crucial purpose of this study is to determine whether or not metacognitive awareness has a significant relationship with computer self-efficacy. The Shapiro-Wilk Test for Bivariate Normality has a p-value of 0.987, indicating that the distribution is normal. Therefore, a parametric test, Pearson's r correlation, is suited for this distribution.

The Pearson's r value for the variables presented is 0.498*, with a p-value of <.001, which shows a moderate positive correlation. The dependent variable is computer self-efficacy, and the independent variable is metacognitive awareness. indicating a moderate positive relationship. Furthermore, a p-value of <.001, which is lower than the 0.05 threshold, indicates a significant relationship between metacognitive awareness and computer self-efficacy. Hence, the null hypothesis, which stated that there is no significant relationship between metacognitive awareness and computer self-efficacy, is rejected.

Table 4. Significance of the Relationship Between Metacognitive Awareness and Computer Self-efficacy

	Pearson's r	p
Metacognitive Awareness – Computer Self-efficacy	0.498*	<.001

*Significant at 0.05 significance level

Significance of the Relationship Between Computer

Literacy and Computer Self-efficacy

Another crucial purpose of this study is to determine whether or not computer literacy has a significant relationship with computer self-efficacy. The Shapiro-Wilk Test for Bivariate Normality has a p-value of 0.445, indicating that the distribution is normal. Hence, a parametric test, Pearson's r correlation, is suited for this distribution.

It reveals that computer literacy and computer self-efficacy have a Pearson's r-value of 0.975*, indicating a very strong positive relationship. Additionally, a p-value of <.001, or less than 0.05, indicates a significant relationship between computer literacy and computer self-efficacy. Thus, the null hypothesis, which states that there is no significant relationship between computer literacy and computer self-efficacy, is rejected.

Table 5. Significance of the Relationship Between Computer Literacy and Computer Self-efficacy

	Pearson's r	p
Computer Literacy – Computer Self-efficacy	0.975*	<.001

*Significant at 0.05 significance level

Significance of the Relationship Between Metacognitive Awareness and Computer Literacy

As illustrated in Table 7, the metacognitive awareness and computer literacy have a Pearson's r-value of 0.700*, indicating a strong positive relationship. Moreover, a p-value of <.001, or less than 0.05, indicates a significant relationship between metacognitive awareness and computer literacy. Thus, the null hypothesis, which states that there is no significant relationship between metacognitive awareness and computer literacy, is rejected. The Shapiro-Wilk Test for Bivariate Normality has a p-value of 0.984, indicating that the distribution is normal. Therefore, a parametric test, Pearson's r correlation, is suited for this distribution.

Table 6. Significance of the Relationship Between Metacognitive Awareness and Computer Literacy

	Pearson's r	p
Metacognitive Awareness – Computer Literacy	0.700*	<.001

*Significant at 0.05 significance level

Significance of the Influence of the Domains of Metacognitive Awareness on Computer Self-efficacy

As shown in Table 7, the regression analysis has an F-value of 7.425 and a p-value of <.001, indicating that metacognitive awareness significantly influences computer self-efficacy, as the p-value is less than the 0.05 significance level.

The coefficient of determination (R^2) of 0.252 connotes that 25.20% of computer self-efficacy is explained by metacognitive awareness, while the remaining 74.80% is explained by other factors not included in the study.

Table 7. Significance of the Influence of the Domains of Metacognitive Awareness on Computer Self-efficacy

Metacognitive Awareness	**Coefficients**	**t**	**p**	**Decision *a*=0.05**
Declarative	0.063	0.605	0.546	H_o is not rejected
Procedural	0.018	0.173	0.836	H_o is not rejected
Conditional	0.123	1.086	0.279	H_o is not rejected
Planning	0.156	1.515	0.132	H_o is not rejected
Monitoring	0.177	1.900	0.060	H_o is not rejected
Evaluation	0.129	1.411	0.161	H_o is not rejected
Dependent Variable: Computer Self-efficacy				

*p < 0.05 R = 0.502 R^2 = 0.252 F–value = 7.425 p<.001

The Mediating Effect of Computer Literacy on the Relationship between Metacognitive Awareness and Computer Self-efficacy

The data provided in Table 8 illustrates the indirect effects of computer literacy on the relationship between metacognitive awareness and computer self-efficacy. As shown, metacognitive awareness has a positive effect on computer self-efficacy through computer literacy, as supported by a strong, positive, and statistically significant indirect effect of 0.119 (p < .001). This result indicates that computer literacy is a significant mediator of the relationship between metacognitive awareness and computer self-efficacy.

In essence, students with high metacognitive awareness are likely to have strong computer literacy skills, which will improve their confidence in computer-related tasks. This indicates that computer literacy partially mediates the relationship between metacognitive awareness and computer self-efficacy.

Table 8. The Mediating Effect of Computer Literacy on the Relationship between Metacognitive awareness and Computer Self-efficacy

	Estimate	**p**
Metacognitive Awareness – Computer Literacy– Computer Self-efficacy	0.119	<.001

*Significant at 0.05 significance level

DISCUSSIONS

Level of Metacognitive Awareness

The findings revealed that senior high school students demonstrate a high level of metacognitive awareness. This means that learners are able to plan, monitor, and evaluate their cognitive processes as they engage in academic and technology-related tasks. This is not a passive engagement with tasks, as students seem to exercise reflective control over their learning strategies, which is a sign of a high level of cognitive regulation.

The strong metacognitive awareness level can be related to the nature of the Computer Systems Servicing (CSS) strand, which involves structured problem-solving, diagnostic thinking, and procedural sequencing. Activities like system installation, troubleshooting, and hardware setup involve strategic planning and monitoring. These types of performance tasks may have helped students develop effective regulation of their thinking processes.

The result is in line with the findings of Musullulu (2024), which includes that declarative, procedural, and conditional knowledge, as well as planning, monitoring, and evaluation processes, in technical vocational education, these regulatory processes are even more important, as students are expected to independently carry out complex tasks that require accuracy and precision. Also, this is consistent with the findings of Fleur et al. (2021), who reported that a high level of metacognitive awareness is linked to students' adaptability in technology-mediated learning environments.

The result of this study, in relation to the findings of Tezer (2024), indicates that Metacognitive awareness is an essential aspect of learners' ability to comprehend their cognitive processes. Metacognitive awareness is learners' awareness of their cognitive processes while engaging in learning activities. This is also in line with Perels et al. (2020), who found that students scored high on regulation of cognition, reflecting their engagement in planning and monitoring their study behavior. This finding is consistent with the study of Xue and Khalid (2026), which showed that higher levels of metacognitive regulation were significantly related to academic achievement in university students, suggesting that learners who are active in planning, monitoring, and controlling their learning are likely to attain higher levels of achievement.

Level of Computer Self-efficacy

The study found that the respondents have a high level of computer self-efficacy, indicating a strong belief in their ability to perform elementary and complex computer-related tasks. This finding shows that the students not only have the necessary computer skills but also the confidence to meet the technological requirements. The high level of confidence can be attributed to the mastery experiences provided by the CSS program. Hands-on activities, system troubleshooting, software installation, and project outputs allow the accomplishment of tasks several times, thus raising self-efficacy beliefs. In technical-vocational education, task accomplishment is perhaps the most important factor influencing perceived competence.

The result is consistent with Mekheimer's (2025) findings, which emphasize that computer self-efficacy plays a crucial role in students' ability to manage and overcome technological challenges. Students who strongly believe in their computer-related capabilities are more likely to persist in completing digital tasks, explore alternative solutions, and remain engaged rather than withdraw when difficulties arise. This is also in line with Mirazchiyski's (2025) study, which highlights that confidence in one's technological skills significantly enhances learners' motivation, strategic learning behaviors, and sustained participation in technology-mediated environments. When students trust their ability to use computers effectively, they demonstrate greater initiative and adaptability in accomplishing academic requirements. Moreover, the findings support those of Mensah et al. (2024), which indicate that higher levels of computer self-efficacy are strongly associated with increased online learning engagement and satisfaction. This suggests that students who believe in their digital competence are more likely to embrace complex technological tasks, maintain effort despite challenges, and continuously develop their digital skills over time.

Level of Computer Literacy

The results also showed a high level of computer literacy among the respondents. This shows that students not only have operational skills in basic computer functions but also functional and strategic skills needed for academic productivity. The ability to perform tasks such as document preparation, spreadsheet analysis, presentation preparation, internet research, and file management demonstrates the practical application of computer skills. In the CSS strand, these skills are developed through technical activities that involve accuracy, efficiency, and systematic problem-solving.

This result is aligned with the findings of Siddiq et al. (2022), who indicate that computer literacy is not only about technical skills but also enables self-regulated learning. This finding is consistent with the study of Van

Laar et al. (2020), who say that modern views of digital competence see it as moving from basic technical skills to advanced problem-solving and strategic technology use. Also, this is consistent with the findings of Hatlevik et al. (2021), who found that students with high digital competence are more efficient and autonomous in digital environments, including searching for information, using software, and troubleshooting.

Significance of the Relationship Between Metacognitive Awareness and Computer Self-efficacy

The study revealed a noteworthy relationship between metacognitive awareness and computer self-efficacy. This entails that students who are more aware of their own thinking processes tend to feel more confident in their ability to use computers effectively. They are better at planning how to approach digital tasks, monitoring their progress, and evaluating the strategies they use when facing technological challenges. This implies that schools should implement strategies that strengthen students' metacognitive awareness, as this can lead to higher computer self-efficacy, improved problem-solving skills, and more independent and confident use of digital technologies.

The result of this study aligns with Ortega-Ruipérez's (2023) findings that learners who reflect on difficulties with software or tools may be more inclined to seek tutorials or practice sessions, thus improving both skill and confidence. This is also in line with Sariyutan (2025), who found that metacognitive awareness and computer self-efficacy mediate the effect of security awareness on effective threat management performance. Furthermore, this finding supports the study of Ulfert-Blank et al. (2022). Who pointed out that metacognitive awareness, as a bidirectional dynamic, can enhance learners' confidence in technology, whereas higher self-efficacy leads to increased use of reflective strategies, thus promoting digital competence.

Significance of the Relationship Between Computer Literacy and Computer Self-efficacy

The study's results unveiled a significant relationship between computer literacy and computer self-efficacy. The p-value indicated a correlation between these two variables. This entails that students with higher levels of computer literacy tend to have greater confidence in their ability to use computers, as their skills and familiarity with digital tools enhance their sense of competence when performing computer-related tasks. This implies that improving students' computer literacy can positively influence their computer self-efficacy and support more effective, independent, and confident use of digital technologies in academic and everyday contexts.

The finding aligns with the study of Ibrahim et al. (2023), who concluded that computer literacy is related to computer self-efficacy, indicating that This literacy is the basis of computer self-efficacy, which is the learners' confidence in their ability to accomplish computer-related tasks successfully. This also supports the findings of Li et al. (2022), who found that Computer literacy, defined as the ability to effectively use computer applications such as word processing, spreadsheets, and online platforms, has become an essential competency for students in the digital era. This is also in relation to Getenet et al. (2023) and Yuan (2024), who confirm that higher levels of computer literacy are positively associated with stronger self-efficacy, indicating a reinforcing relationship between the two constructs.

Significance of the Influence of the Domains of Metacognitive Awareness on Computer Self-efficacy

The regression coefficient is used to test the significance of the influence of overall metacognitive awareness and computer self-efficacy among Senior High School students. Using Multiple Regression in JASP, the data reveal no significant influence of metacognitive awareness and computer self-efficacy among Senior High students, underscoring the importance of metacognitive knowledge and regulation for effective learning and performance. Students who are actively involved in planning, controlling, and evaluating their tasks can effectively handle computer-related tasks, which, in turn, helps improve their confidence in their technological skills.

The result aligns with the findings of Saunders-Wyndham et al. (2021), which focus on learners' capacity to plan, monitor, and evaluate their use of cognitive and learning strategies in digital tasks. Moreover, the results of this study align with those of Ulfert-Blank et al. (2022), who indicate that Computer self-efficacy refers to the belief in one's capacity to use computers or digital tools effectively and confidently. Also, this is consistent with the

findings of Saunders-Wyndham et al. (2021), who explained that students with high metacognitive awareness are likely to have high computer self-efficacy, as they can recognize their own shortcomings and work through them when faced with challenges. This is also consistent with the study by Ortega-Ruipérez (2024), which found that students who perceive challenges with software or tools may be more likely to seek tutorials or practice sessions, which could lead to enhanced skills and confidence. In the digital security field. This is also in line with Sariyutan (2021), who found that metacognitive awareness and self-efficacy act as mediators between security awareness and effective threat management.

Mediating Effect of Computer Literacy on the Relationship between Metacognitive Awareness and Computer Self-efficacy

The regression analysis shows a significant mediating effect of computer literacy on the relationship between metacognitive awareness and computer self-efficacy. The results of the mediation analysis show that computer literacy is a significant mediator for the association between metacognitive awareness and computer self-efficacy among senior high school students. This suggests that students with high metacognitive awareness are more likely to develop computer literacy skills, which, in turn, contribute to high computer self-efficacy. Metacognitive awareness helps students to effectively plan, monitor, and evaluate the learning process as they use digital technology. By doing this, students are more capable of enhancing their computer literacy skills, such as basic computer skills, word processing, spreadsheet management, and presentation development, among other computer skills. As students become more familiar with these digital technologies, they develop greater confidence in completing computer-related tasks.

The mediating role of computer literacy indicates that metacognitive awareness, in addition to directly influencing computer self-efficacy, also does so indirectly by facilitating the development of computer literacy skills among students. Thus, it may be concluded that students with high metacognitive awareness are better able to enhance computer literacy skills, which, in turn, would lead to greater computer self-efficacy. This fact therefore confirms the idea that computer literacy is the mediating factor linking high-level cognitive skills with students' computer self-efficacy. Thus, it may be concluded that the development of metacognitive awareness among students would lead to the development of high computer literacy skills, which, in turn, would lead to high computer self-efficacy.

This result is consistent with the findings of Schunk and DiBenedetto (2020) highlighted that self-regulated learners who use metacognitive processes have stronger self-efficacy beliefs because they are able to monitor and control their learning processes. Also clarified that metacognitive regulation increases learners' confidence in their learning by enabling them to attribute their success to effective strategy use rather than luck. In technology-based learning environments, students with higher metacognitive awareness are better able to reflect on their computer-related experiences and improve their performance across general and advanced computer tasks, thereby further enhancing their computer self-efficacy.

CONCLUSION

The level of metacognitive awareness among Computer Systems Servicing students is high, indicating that they can plan, monitor, and control their learning effectively. The level of computer literacy is high, indicating that students have strong competencies in word processing, spreadsheet management, presentation development, and general computing. Moreover, the level of computer self-efficacy is high, indicating that the students have high confidence in performing general and advanced computer-related tasks. The results also showed a significant, moderate, positive relationship between metacognitive awareness and computer self-efficacy. Furthermore, there is a very strong positive relationship between computer literacy and computer self-efficacy. Moreover, a significantly strong positive relationship exists between metacognitive awareness and computer literacy. Although metacognitive awareness significantly influences computer self-efficacy as a whole, none of its individual domains, declarative, procedural, conditional, planning, monitoring, and evaluation, independently showed a significant effect. Finally, the mediation test confirmed that computer literacy is indeed a significant mediator between metacognitive awareness and computer self-efficacy. This indicates that metacognitive awareness enhances computer literacy, which in turn enhances students' confidence in computer-related activities.

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