Computer Self-Efficacy, Technology Usage, and Information Literacy Self-Efficacy among First-Year Undergraduates

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.909000118

Received: 25 August 2025; Accepted: 31 August 2025; Published: 01 October 2025

ABSTRACT

In the context of today's digital learning environment, Information Literacy Self-Efficacy (ILSE) has become essential. With the dynamic and diverse information sources available, students are presented with numerous options to retrieve and utilize information. However, many first-year undergraduates often lack the confidence and skills to effectively evaluate, organize, and apply this information in academic contexts. This study aims to assess the ILSE of first-year undergraduate students in a public university in Johor and to examine its relationship with computer self-efficacy (CSE) and technology usage (TU). A quantitative survey was conducted among 74 respondents, and data were analyzed using descriptive statistics and correlation analysis. The results indicated that students demonstrated a moderate level of ILSE, reflecting both a foundational understanding and some uncertainty in handling academic information tasks. Further analysis revealed a moderate positive correlation between CSE and ILSE, suggesting that students with higher confidence in computer use are also more capable in information literacy tasks. The findings imply that while students begin their university journey with basic ILSE, there remains a need for structured guidance and instructional support to strengthen these skills. The study recommends collaborative efforts between librarians and lecturers to design integrated information literacy programs that can foster stronger self-efficacy and better equip students for academic success.

Keywords: Information Literacy Self-efficacy, Computer Self-efficacy, Technology Usage, First-year Undergraduate Students

INTRODUCTION

Digital humanities in the 21st century have revolutionized societal access to and management of various information sources, driven by technological advancements and expansion [1]. In this modern information landscape, information sources depend not only on printed or media formats but are far beyond that, leading us to the dynamic information format. The vast and dynamic information sources available nowadays often lead individuals to information overload. From the student's perspective, they need to perform their academic task by conducting research, reviewing, analysing data, and properly citing sources. The dynamic information sources nowadays can also lead students to use information unethically, intentionally, or unintentionally, contributing to misinformation and disinformation that can erode public trust and distort understanding of critical issues [2]. Moreover, the digital information available nowadays allows individuals to learn independently and adapt to new technology using intelligent learning tools, significantly changing learning [3]. Therefore, information literacy is necessary to cope with information overload, empower the evaluation of information, encourage ethical and legal use of information, and encourage problem-solving. Information literacy refers to an individual's ability to recognize when information is needed and to locate, evaluate, and use effectively the required information. In the context of the modern digital world, the definition of IL can

also evolve [4]. According to the Association of College Research Libraries [5], IL is the ability to discover information reflectively, comprehend the production and value of information, and use the information to generate new knowledge and engage in ethical learning communities. In line with that, Carretero et al.[6] asserted that individuals can discover digital data, information, and content and recognize information needs. Furthermore, the individual efficiently evaluates content and source relevancy and stores, controls, and arranges digital data and information. Self-assessment of self-efficacy is recommended, as information literacy appears to be a vital skill for student academic success, mainly when used as an assessment method [7]. Schunk and DiBenedetto [8] mentioned that Self-efficacy is the perception of one's ability to control important life events, and demonstrating its potential for improvement is essential due to its influence on learning, motivation, and self-regulation. According to Bandura [9], self-efficacy is a theoretical framework that can be used to understand the way students are assured of accomplishing their academic tasks and activities. Howell and Hickman [10] mentioned that Self-efficacy is a solid theory in any field and activity. Through self-efficacy, an individual can become devoted to achieving the outcome and view the challenge as to improve their skills [11]. Besides, self-efficacy is the confidence in one's ability to complete a task based on personal belief rather than just skills, meaning a person may have the necessary skills but not necessarily believe they can successfully perform the activity [12]. Therefore, ILSE refers to the "students' self-belief in their capacity to handle and evaluate the vast amount of information they find to support their study" [13].

Problem Statement

Information literacy refers to "an individual's ability to use computers to investigate, create, and communicate to participate effectively at home, at school, in the workplace, and in society"[13]. Jabeen et al. [14] mentioned that information literacy is an expanding and recognized study subject within Library and Information Science (LIS), garnering significant attention from researchers across numerous fields. Previous studies indicate that information literacy in education seeks to cultivate students with the skills to locate, evaluate, and appropriately utilize the information necessary to address their problems[14-16]. According to Chuang et al. [17], students rely on computer and internet information. Moreover, Google and intelligent learning tools have become the primary search tools for them to perform academic tasks [3,18]. Jabatan Penerangan Malaysia [18] survey included 3,800 respondents stated that phony news can influence Malaysian society. As reported by the Malaysian Communications and Multimedia Commission, since 2024, they successfully withdrew 17,000 out of 19,000 fake news from various platforms. Nurul Afiqah and Azura [20] highlight that students of higher learning institutions (HEIs) comprising Generation Z are indeed more vulnerable to the use of AI technology to complete assignments, as AI is capable of performing in-depth text analysis and generating new content quickly, which encourages students to plagiarize. Based on this scenario, refer to Yu et al. [21] emphasized that information content and technology should be integrated components rather than treated separately, as self-efficacy plays a key role in improving information literacy [22]. Concern with Gen Z, Siti Mahani and Nazlinda [23] stated that Gen Z spends more time engaging online than in real life as they perceive technology as a highly realistic and convenient information tool, with everything just a tap away. Therefore, Information Self-efficacy (ILSE) must be assessed in the students. McPherson [24] identified many first-year students who lack information literacy as a cause of library anxiety. Varlejs and Stec [25] reported that high school librarians faced students who did not consider evaluating information sources as necessary. Lanning and Mallek [26] stated that most first-year students do not have information literacy skills. Like Gross and Latham's [27] finding, no first-year students reached the advanced level of IL skills, as the score is 65% minimum to be considered proficient. It concluded that students lack the necessary information literacy (IL) skills when they enter higher education. Aharony and Gazit [13] found that graduate students achieve higher IL Self Efficacy (M=5.94, SD=0.62) compared to undergraduates (M=5.51, SD=0.77), as researchers recommend ILSE should be carried out in another country, focusing on undergraduates.

Therefore, this study will determine ILSE, computer self-efficacy, technology usage, and perceived information overload among first-year undergraduate students. The research questions proposed in this study are :

RQ 1: Is there a relationship between computer self-efficacy and information literacy among first-year undergraduate students?

RQ 2: Is there a relationship between technology usage and information literacy among first-year undergraduate students?
RQ 3: To what extent do computer self-efficacy and technology usage predict information literacy self-efficacy among first-year undergraduate students?
RQ 4: What is the Perceived Information Overload level among first-year undergraduate students?

LITERATURE REVIEW

Information Literacy Self-efficacy

Information literacy (IL) has been widely accepted as a necessary skill set for both widening academic success and lifelong learning [28,13,29]. Therefore, information literacy self-efficacy (ILSE) not only correlates but also serves as a predictor and the factors that affect its development and effects on different learning outcomes. Learners who are exploring information environments will have more confidence in ILSE [30]. According to Bandura [31], the concept of ILSE highlights the "influence of self-belief on motivation, persistence, and performance. Information literacy needs self-efficacy as it develops the confidence of an individual to regulate their action in using information effectively. The higher the self-efficacy, the more confidence students have in information literacy. Low self-efficacy can correlate with limited capability in information literacy. According to Lawanda and Ulfa[32], students expressed confidence in their information literacy skills, except in accessing electronic sources such as e-books and e-journals. Prabowo et al. [33] found that although information science (LIS) students were competent in searching, locating, selecting, and using information sources, on the other hand, they might not have been equally confident in the ability to analyse and interpret the information they found in writing a research paper, especially in understanding and summarizing data. Soroya et al. [34] found that female students perceived their information literacy skills as higher than male students, yet students faced greater difficulty in locating library resources and searching online international journals.
Medaille et al. [35] added that students experienced fluctuating confidence levels throughout their thesis projects, with many feeling uncertain about their progress and ability to find quality sources compared to graduate students. Consistent with Aharony and Gazit [36] study found graduate students have higher learning ability in ILSE compared to undergraduates, even from the information science department. Therefore, according to Bacarrisas [37] indicated that there is a positive correlation between self-efficacy in information literacy and self-efficacy in IL skills among undergraduate students. However, Seng et al. [38] found low ILSE for all components of production skills, information handling skills, and library resources skills, whereas no significant difference was found based on gender and academic year. Attikuzaman and Ahmed [39] revealed that even undergraduate students could perform essential ILSE; however, they were poor in ILSE performance in advanced and intermediate Information skills, which also led to library anxiety.

Computer Self-Efficacy

Bandura [39] describes Self-efficacy as "people tend to avoid tasks and situations which they believe exceed their capabilities, but they undertake and perform activities they judge themselves capable of handling." Hussain et al. [12] added that self-efficacy can be described as a person who has faith in their ability to perform some work. As self-efficacy is derived from self-perceptions of capabilities to carry out some behaviours, the construct is termed situation-specific or domain-sensitive and may be regarded as the most crucial determinant of the lifelong learning component of self-regulation. For this reason, the Self-Efficacy concept has been broadened to other literacies, including computer self-efficacy and digital literacy [40]. Previously, Compeau and Higgins [41] found that computer self-efficacy is a key factor in understanding how people interact with technology because it shows cognitive engagement and has a significant impact on how people use technology in many settings, such as schools, where it is becoming more and more integrated into the learning process, and also influences students' intentions to use technology effectively. Computer self-efficacy refers to what a person believes in line with their ability to use computers to complete particular tasks. Cassidy and Eachus [42] reported that computer self-efficacy is a dominant predictor of the frequency and success of computer use. Waldman [43] indicated that undergraduates expressed interest in utilising the library's electronic resources and exhibited high levels of computer self-efficacy. According to Rohatgi et al. [44], there is a positive relationship between ICT, Information Literacy, and academic achievement, and Li et

al. [45] emphasised that computer self-efficacy is important in translation technologies. Adeniran [46] found that postgraduate students in private Nigerian universities who had higher confidence in their computer skills were more likely to use electronic resources effectively. Ebijuwa and Mabawonku [47] saw a similar pattern among undergraduates in federal universities in South-West Nigeria. They also found that students with stronger computer self-efficacy were more likely to use electronic library resources. On a broader scale, Hatlevik et al. [48] mentioned that socioeconomic status also contributes to self-efficacy, influencing technology use in education. Therefore, Computer Self-Efficacy (CSE) and Information Literacy Self-Efficacy (ILSE) are correlated. When someone feels confident using computers, they're also more likely to feel capable of finding, evaluating, and using digital information. In short, the more comfortable you are with technology, the better equipped you are to handle digital information in school or work settings [13,48,49].

Technology Usage

To be information literate, users must know how to find, evaluate, and use information responsibly [50]. In short, strong information literacy skills make technology more useful and meaningful in our everyday lives. Sahabi et al. [51] further elucidate that a deficiency in information literacy skills impedes the ethical and accurate acquisition and utilisation of information and could also be a catalyst for the underutilisation of electronic information resources. According to Liong et al. [52], effective technology usage depends on information literacy because critical evaluation and ethical use of information improve our ability to access and share digital content through various technological tools and platforms. Nikuo et al. [53] stated that information literacy significantly influences the perceived ease of use of technology in the workplace, especially in an academic setting. Toyo [54] indicates that Delta University students demonstrate a high percentage of information literacy but face technological obstacles in accessing e-resources. Students who demonstrate strong information literacy skills exhibit higher confidence levels when utilising technology to achieve academic success. Jang et al. [55] conducted a study of university students from South Korea and Finland revealed that students who possessed strong information literacy skills positively evaluated and used technology to enhance their learning process.

METHODOLOGY

This study used a quantitative correlational research design to examine the links between computer self-efficacy, technology usage, and information literacy among first-year undergraduate students. It took place at a reputable public university in Johor and focused on students enrolled in the Information Science degree program. The target population included 80 students, and purposive sampling was used to select those most relevant to the study's goals. Of the 80 students invited, 74 completed the survey, yielding an impressive response rate of 92.5%. Among the respondents, 59 were female (79.7%) and 15 were male (20.3%). Data were collected using a structured, self-administered questionnaire made up of five sections. The first section gathered demographic information such as age, gender, and prior technology exposure. The remaining four sections were adapted from previously validated instruments. Information Literacy Self-Efficacy (ILSE) was measured using a scale developed by Kurbanoglu et al. [40], which assesses students' ability in finding, analysing, and applying information. Bellini et al. [56] provided the items used to measure Computer Self-Efficacy (CSE), which focuses on students' perceived proficiency with computer programs. A scale modified from Teo [57] was used to measure Technology Usage (TU), the ability of students to use technology for academic purposes. Finally, the Perceived Information Overload (PIO) section, adapted from Chen et al. [58], assessed how students value and trust information found online, as shown in Table 1. ILSE and TU used a seven-point Likert scale (1=strongest disagreement; 7 strongest agreement), while CSE & PIO used a five-point Likert scale (1=strongest;5=strongest agreement).

Table 1: Item Distribution in the Survey

Section	Variable	Item
B	ILSE	28
C	CSE	4

D	TU	4
E	PIO	2

Statistical Package for Social Sciences (SPSS) version 29 was used for data analysis. Data were analyzed using Spearman Correlation and Descriptive statistics. As shown in Table 2, the SPSS analysis revealed a Cronbach Alpha above 0.7 for three (3) variables, indicating the instruments' acceptable internal reliability data. PIO was measured with a two (2)-item version as adopted from Aharony and Gazit [13] based on Chen et al. [58], which includes seven 7 items.

Table 2: Reliability Analysis

Cronbach's Alpha	**Item**	**Variable**
.882	28	ILSE
.849	4	CSE
.733	4	TU

Normality tests were analyzed using the Shapiro-Wilk test, as shown in Table 3. The results indicate that CSE and TU are normally distributed, whereas ILSE is not. Since ILSE has a significance value of 0.020 (<0.05), indicating it is not normally distributed, Spearman's correlation will be used for the analysis.

Table 3: Normality Test

Variable	**Sig.**
Mean_ILSE	.020
Mean_CSE	.052
Mean_TU	.303

RESULT

A Spearman's rank-order correlation was conducted to examine the relationships between computer self-efficacy (CSE), technology usage (TU), and information literacy self-efficacy (ILSE). The results are summarized in Table 4.

Table 4: Correlations Between ILSE, CSE, and TU

Correlations

			Mean_IL	Mean_CSE	Mean_TU
Spearman's rho	Mean_IL	Correlation Coefficient	1.000	.453**	.307**
		Sig. (2-tailed)	.	<.001	.008
		N	74	74	74
	Mean_CSE	Correlation Coefficient	.453**	1.000	.169
		Sig. (2-tailed)	<.001	.	.149
		N	74	74	74
	Mean_TU	Correlation Coefficient	.307**	.169	1.000
		Sig. (2-tailed)	.008	.149	.
		N	74	74	74

**. Correlation is significant at the 0.01 level (2-tailed).

The results showed a moderate, statistically significant positive link between CSE and ILSE, $\rho(74) = .453$, $p < .001$. It indicates that students who felt more confident using computers also tended to feel more confident in their information literacy skills. There was a significant positive correlation between TU and ILSE, $\rho(74) = .307$, $p = .008$, even though it is weak. Indicate that students who used technology more often generally felt a bit more confident in their ability to handle information effectively. However, there was no significant

correlation between CSE and TU (ρ(74) =.169, p =.149). Therefore, in this group, the frequency of technology use did not necessarily correlate with the level of confidence one possessed in computers.

Table 5: Regression Results for CSE and TU on ILSE

Bootstrap for Coefficients

Model		B	Bootstrap[a] Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval Lower	Upper
1	(Constant)	1.927	.004	.269	<.001	1.376	2.454
	Mean_CSE	.325	-.001	.083	<.001	.155	.499
	Mean_TU	.144	-.001	.053	.010	.041	.247

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

As shown in Table 5, a multiple regression analysis was conducted to examine the extent to which computer self-efficacy (CSE) and technology usage (TU) predict information literacy self-efficacy (ILSE). Recognizing the non-normal distribution of data, a robust bootstrapping technique was applied to ensure accurate and trustworthy results. The analysis showed that both computer self-efficacy and technology usage were statistically significant predictors of information literacy self-efficacy. Specifically, CSE had a stronger effect, with a standardized coefficient of B = .325, p < .001, and a 95% confidence interval ranging from .155 to .499. This suggests that students who feel more confident using computers are more likely to feel confident in their ability to locate, evaluate, and use information effectively. Meanwhile, technology usage (TU) also made a statistically significant but smaller contribution, B = .144, p = .010, with a 95% confidence interval between .041 and .247. This indicates that students who use technology more frequently tend to have slightly higher levels of information literacy self-efficacy. Overall, the results support the conclusion that both CSE and TU contribute positively to students' confidence in managing information, with CSE being the stronger predictor.

Table 6: Handle Online Information Effectively

Handle_Info

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.7	2.7	2.7
	Disagree	15	20.3	20.3	23.0
	Neutral	48	64.9	64.9	87.8
	Agree	8	10.8	10.8	98.6
	Strongly Agree	1	1.4	1.4	100.0
	Total	74	100.0	100.0	

Table 6 shows, the majority of 48 students (64.9%) were “Neutral,” suggesting a moderate level of confidence in their ability to “handle online information”. Meanwhile, 15 students (20.3%) indicated “Disagree,” and 2 students (2.7%) “Strongly Disagree,” reflecting low confidence or a lack of knowledge in this area. On the other hand, 8 students (10.8%) agreed, and only 1 student (1.4%) strongly agreed that they were confident in handling information found online. These results suggest that while a small number of students feel confident, a significant portion either feel uncertain or lack confidence in managing online information.

Table 7: No Idea About the Abundance of Online Information

NoIdea

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	12.2	12.2	12.2
	Disagree	31	41.9	41.9	54.1
	Neutral	30	40.5	40.5	94.6
	Agree	4	5.4	5.4	100.0
	Total	74	100.0	100.0	

Whereas Table 7 presents "no idea to find online information" about that particular topic, due to the abundance of information on the internet. A majority of 31 students (41.9%) "Disagree" and 9 students (12.2%) "Strongly Disagree indicates they believed they had little to no difficulty finding information online. Meanwhile, 30 students (40.5%) chose the "Neutral", suggesting uncertainty or indecisiveness about their information-searching ability. Only 4 students (5.4%) agreed that they had no idea how to find online information, and none strongly agreed with this statement. Overall, the findings suggest that most students do not perceive themselves as completely unaware of how to search for online information, though a considerable portion remain uncertain.

DISCUSSION

The objective of the study is to examine the relationship among first-year undergraduate students' computer self-efficacy (CSE), technology usage (TU), and information literacy self-efficacy (ILSE). The findings showed that CSE and ILSE had a moderately significant positive correlation ($\rho(74) = .453$, $p < .001$). This suggests that students who feel more comfortable using computers also feel more capable of locating and assessing information. Aligns with Aharony and Gazit [13], who also found a positive correlation between CSE and ILSE. A similar result was also reported before by Keshavarz et al. [59] found that self-efficacy has correlated meaningfully with information literacy. Meanwhile, Seng et al. [38] found that the ILSE mean score for Cambodian students was noted at the mid-point (m=2.50) for all components of production skills, information handling skills, and library resources skills, referring to low ILSE, and it indicates information technological infrastructure was insufficient, as it correlates with ILSE. As this study shows a moderate relationship, it indicates that first-year undergraduate students need to be proficient and competent in all components of ILSE, focus on locating, initiating search strategies, communicating, interpreting, and evaluating information sources. Similar found by Keshavarz et al. [59], identifying and locating are the least reported by the respondents, as it is important and basic in information skills. This study also shows that CSE and TU were the important factors in ILSE. Among these two predictors, CSE appears as the stronger predictor, indicating that students who are competent in computer skills feel more confident in locating, evaluating, and applying information effectively. Align with the study by Ebijuwa [47] and Sadiku and Kpakiko [60] showed that CSE is a major factor, as students with high levels of computer self-efficacy use electronic resources more often and perform better than those with low levels, and tend to be more satisfied. Agreed also by Dauda et al. [61], CSE brought a major impact on the usage of the internet among undergraduate students in Borno State libraries. TU also emerged as a stronger predictor after CSE. It is also indicated that more frequent use technology, than it is enhances their skills in ILSE. Fraillon and Rožman [62] note that as young people increasingly use technology and it becomes a bigger part of their daily lives, it's more important than ever for students to develop the confidence, awareness, and skills to use it effectively. For PIO, it shows many students aren't completely sure about their ability to find and manage information online. Only a few felt confident using digital resources, while many others either weren't confident or weren't sure how they felt. Most students didn't think they were totally unskilled, but a good number still felt unsure. Overall, it seems students have a basic idea of how to search for and judge online information, but their confidence and ability to use those skills consistently are still pretty limited as its similar found by Seng et al. [38], McPherson [24] , and Attikuzaman and Ahmed [7].

CONCLUSIONS

First-year undergraduate students at a reputable public university in Johor have confidence in using computers and also tend to feel more capable when it comes to finding, evaluating, and using information effectively. Furthermore, students did not view themselves as completely lacking the skills to search for online information. Yet, a number of them still felt unsure or uncertain during the process as they were only in their first year of study. Even so, many students still felt unsure during the process, likely because they were only in their first year. The findings suggest that while first-year undergrads are starting to build confidence in their basic information literacy skills, they're still early in their academic journey. Their ability to apply those skills is growing, but not fully developed yet. This shows how important it is to offer clear guidance and ongoing support to help them get better at finding, evaluating, and using information as they move through their studies. Due to the moderate relationship result, it's recommended for future research to carry out with a

greater sample by involving all undergraduate students across years of studies and various institutions to gain a more comprehensive understanding. Future studies also, may also view other potential variables such as academic performance, Artificial Intelligence literacy, or even study habits. Perhaps, adopting qualitative or mixed methods also provides more in-depth insights and understanding of the ILSE phenomenon. It's also recommended that lecturer should emphasize computer self-efficacy and technology in their curriculum delivery. Further, lecturers should collaborate with the library in strengthening first-year undergraduate information literacy. Additionally, the lecturer may encourage students to explore more digital resources, peer mentoring, and explore and use of the digital library collection in their academic tasks. Even, librarians are more expert in information literacy, lecturers also need to play a role in developing students' information literacy. Integrate students with information-searching tasks, critical evaluation of sources, and proper citation practices into their learning. A lecturer may also design or integrate the Information Literacy concept into the curriculum, which aligns with course objectives. To achieve this, the lecturer may design research-based assignments that require students to actively engage in information literacy. Moreover, the lecturer can assess students' understanding of Information Literacy through real-world tasks and practical scenarios, thereby enhancing their confidence and self-efficacy in Information Literacy.

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