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THE RELATIONSHIP BETWEEN DIGITAL LITERACY AND WRITING SKILLS AS MEDIATED BY SELF-DIRECTED LEARNING READINESS

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Abstract:
The study aimed to identify the significant relationship between digital literacy and writing skills, as mediated by self-directed learning readiness, among first-year English major students from six private college schools in Davao City. The number of respondents per stratum was determined using stratified random sampling, and 300 students from six private colleges in Davao City were selected as respondents. The results showed that the level of digital literacy among first-year English major students is high, while their writing skills and self-directed learning readiness are also high. The analysis indicated significant correlations between digital literacy and writing skills, between digital literacy and self-directed learning readiness, and between self-directed learning readiness and writing skills, and it also demonstrated that self-directed learning readiness fully mediated the relationship between digital literacy and writing skills. This finding highlights the value of developing students' independent learning and use of digital tools. It suggests curricula include structured and independent tasks that build autonomy and technological skills to improve writing outcomes.

Keywords: education, digital literacy, writing skills, self-directed learning readiness, mediation, Philippines

1. Introduction

Writing skills are essential because they underpin learners' academic success and overall achievement (Aliyu 432). It also serves as a critical thinking tool that supports the development of other language skills, including vocabulary, pronunciation, and grammar (Khazrouni 433). Despite its importance, many students continue to struggle with writing. They encounter difficulties in grammar, vocabulary, cohesion, sentence

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structure, organization, and punctuation. These challenges hinder their ability to produce clear, coherent, and effective texts. Collectively, all of these factors contribute to poor writing skills (Kemalsyah 2; Elbashir 40).

Numerous studies have proven the existence of issues with writing. In a study conducted by (Sarwat et. al 1-8), students encountered serious problems in writing, including being unable to write grammatically precise English paragraphs due to poor command of English tenses, grammar, syntax and insufficient vocabulary. Students continue to face challenges in English, particularly in writing, struggling with word choice, punctuation, spelling, capitalization, verb tenses, and sentence structure (Elbashir 4–8). Furthermore, many students make mistakes in spelling, punctuation, and capitalization of pronouns (Amarga and Quirap 2). Also, it is stressed that the majority of the writing problems were surface problems, particularly those related to verbs, nouns, and prepositions (Gactcho and Ramos 49-56). As for writing attitudes, they added that the participants of the study generally manifested positive attitudes towards writing. In addition, lack of vocabulary in the target language, difficulty in conveying and organizing ideas, pupils' perception that writing is a hard task, lack of motivation and interest in writing; and the difficulty in spelling, grammar and sentence construction are the reasons why many elementary pupils have poor writing skills in English and Filipino (Savedra and Barredo 2-4).

In addition, (San Miguel 164) the study revealed that among the problems faced by the students are grammatical errors, inappropriate use of political concepts, and inappropriate use of vocabulary. It is also found out that unnecessary shift in tense, ambiguous pronoun reference, loose sentence, sentence fragment, dangling modifier, and wordy sentence are next in line. Most difficulties encountered are more on syntax and technicalities. Added, the hindrances include: mood to write, wrong usage of grammar, punctuation marks and inappropriate sentence construction as a result of a narrow vocabulary range and capacity. It also showed that topic interest, lack of ideas, and motivation prevent students from having attentiveness to write. These hindrances give students a negative impression when they are told to write. According to Susanto (46-50), some of the problems faced by the students include limited vocabulary and difficulty using words in context. Grammar, vocabulary and pronunciation are also major concerns of English major students (Padilla et al. 2022).

Writing serves as a crucial channel through which individuals express their feelings, ideas, and reasoning. It plays a vital role for both educators and learners. Given its complexity and significance, writing deserves focused study and development. As noted by Ghafar and Mohamedamin, mastering writing in an unfamiliar language, such as English, presents considerable challenges.

2. Literature Review

Digital literacy plays a significant role in enhancing writing skills, as it equips individuals with the tools and competencies needed to engage effectively with information in various

forms. The process of writing is no longer limited to pen and paper; it now involves interpreting concepts and ideas through multiple modes—reading, viewing, observing, and perceiving—all of which contribute to a deeper understanding of content. According to Joseph and Khan, digital literacy involves the capacity to locate, assess, use, share, and produce content through digital technologies and the internet (21-23). With this skill, writers can access a wide range of resources that support the development of their ideas, refine their writing styles, and improve the overall quality of their outputs. Digital literacy empowers individuals to become more critical and innovative in their writing by allowing them to draw from multimedia content, online collaboration tools, and global sources of information—making writing a more dynamic, interactive, and informed practice (Joseph and Khan, 24).

The relationship between digital literacy and writing skills, mediated by self-directed learning readiness, is supported by the Theory of Connectivism, proposed by Siemens and Downes. This theory explains that being digitally literate enables students to access, evaluate, and synthesize information, thereby fostering self-directed learning that ultimately enhances their writing skills. Constructivist Learning Theory (1978), rooted in the work of Piaget and Vygotsky, further emphasizes that learners actively construct knowledge through experiences and interactions with their environment. In the digital age, this environment includes online platforms, multimedia resources, and interactive tools. As Coiro et al. (163–171) highlight, digital literacy enables engagement with diverse texts and technologies, supporting critical thinking, analysis, and information production, all essential components of writing. Digital literacy also promotes autonomy, enabling students to manage and direct their own learning, thereby strengthening their readiness for self-directed learning. According to Garrison (1997), digital environments facilitate cognitive and metacognitive engagement, which is necessary for setting goals, managing time, and evaluating progress, thereby improving writing performance.

According to Hamouma and Menezla (2-16) revealed a strong positive correlation between digital literacy and English academic writing skills was revealed, with results showing statistical significance at the 0.01 level. This indicates that digital literacy is a key contributing factor to improving students' academic writing skills in English. Their findings affirm that as students become more digitally literate, their ability to produce high-quality academic texts also improves. Supporting this, Wong, Reichert, and Law (2019) found that students' familiarity with digital assessment tools and academic platforms—a core aspect of digital literacy—significantly influences their writing performance. These findings suggest that the more competent students are in navigating digital tools, the better they perform in academic writing tasks.

The importance of digital literacy in writing is also grounded in theoretical frameworks like the Socially Shared Cognition Theory (SSCT), as described by Doak (2009). This theory emphasizes the role of technology in facilitating shared cognitive processes within learning communities. According to Brown and Cole (2000), when students engage in digital learning activities such as educational games or collaborative

online writing, they co-construct knowledge in a social context, which enhances both their communication and writing abilities. Thus, digital tools not only support individual learning but also encourage collaborative writing development, making digital literacy a vital enabler of effective written expression in the modern educational landscape. Moreover, another study conducted showed the positive and significant effect of self-directed learning on the digital literacy level of students. Therefore, a notable and meaningful correlation between self-directed learning and students' digital literacy proficiency is indicated (Rini et al. 300-331).

On the other hand, students are likely to succeed in online education when they possess a high degree of digital literacy and self-directed learning. Therefore, when students have a strong level of digital literacy and the ability to take initiative in their learning, they are more inclined to achieve success in online education (Pepito and Acledan 88).

This study is anchored on the Connectivism Learning Theory of Siemens (2004) capitalizes on the idea that learners should prioritize the development of digital skills (becoming digitally literate), as this is critical in obtaining necessary information across different networks of connection. Also, it underscores the importance of autonomy (self-directed learning) since students are expected to validate previous links and continue to establish information networks that are relevant to them. The importance of self-directed learning in the success of online learning is grounded on the theory of Zimmerman known as the Self-Regulation Learning Theory (2008), which stresses the need for students to supervise their learning.

Adnan (503-505) revealed a positive relationship between students' level of self-directedness and students' readiness to incorporate self-directed learning in English writing skills (79). Moreover, students with a high level of self-directedness scored higher in students' readiness for self-directed learning in improving English writing skills than those with a low level of self-directedness (504). Also, Agbayani and Janfeshan (79-80) results of the present research indicated that the self-directed learning method had significant effects on the pre-intermediate and intermediate students' performance of English writing ability. The results also indicated that there was a significant difference between the two groups of learners in each level regarding their development of English writing ability (79-80).

This is anchored on the theory of Self–directed Learning Theory by Garrison (1997), which is an educational theory or method of content delivery in which the student takes control of their own education. Through the use of self-directed learning, students set their own goals and deadlines while following a broad assignment outcome. They participate in research related to their own interests, while the teacher remains available for support if needed.

In addition, Kurniati, Fithriani and Carabella found that the improvement of EFL learners' writing skills is positively correlated with the use of digital writing assistants. In other words, digital proficiency is highly correlated to the level of writing proficiency (1). Also, a study revealed that students who have low proficiency in English face

challenges in digital literacy since the technological skills are underpinned by English language proficiency, specifically in writing proficiency (Hamad, 2022, pp. 2-13). Further, it is revealed that digital literacy and self-directed learning readiness is positively associated with writing proficiency/skills (Pepito and Acledan 88-89). Therefore, digital literacy and self-directed learning are key to online learning success. These findings implied that students are likely to succeed in online education when they possess a high degree of digital literacy and self-directed learning.

Writing skill has a vital role in English as a Foreign Language (EFL) learning because they are needed to support the learners' academic success (Aliyu 432). While there is existing research that acknowledges the interconnectedness of digital literacy and writing skills, mediated by self-directed readiness, there is still a need for more in-depth investigations. Thus, the researcher is interested in conducting this study as there are no similar or existing studies using the same variables in the local setting. Furthermore, this study will carry the teachers, students, and school leaders to promote and implement effective programs, provide exceptional student classroom engagement and create programs that will help address issues and concerns related. This context motivates the researcher to conduct a study on the relationship between these variables.

As this implies, digital literacy may start with the efficient use of digital tools and communication technologies, but it does not stop there. It is a complex set of skills which include knowledge, understanding, application and reflection (Giannikas, 2020). Similarly, twenty-first-century education places emphasis on the importance of digital literacy (a synthesis of information literacy, internet literacy, and computer literacy), and on how it can be formally and informally acquired to facilitate students' effective integration (Lau & Yuen, 2014), which can lead to numerous benefits.

However, Martin (151-156) has argued, digital literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect on this process.

Buckingham (59-60) explains that digital literacy in the classroom is more than just integrating technology into instruction. It is about students learning via digital tools, being mentored, applying and creating rich learning systems and developing students' understanding of cultural forms in which they interact in and outside of school. Moreover, digital literacy requires critical thinking skills, awareness of appropriate behavior expected in online environments, and an understanding of the social issues created by digital technologies and environments. Therefore, one would argue that to develop digital literacy, students need to become accustomed to the following components: collaboration, creativity, critical thinking, digital citizenship, and communication.

According to Kumar (172-174), ethical considerations in digital education encompass a spectrum of issues that touch upon the core values of education: privacy,

equity, and intellectual property. At the heart of these considerations lies the need to balance technological innovation with a commitment to foster an inclusive, secure, and ethically sound educational environment. One of the most important ethical considerations revolves around the collection, storage, and use of student data. The digital footprint of students in online learning environments raises critical questions about privacy. How can educational institutions ensure the confidentiality and security of sensitive information? What measures should be implemented to protect students from potential data breaches or unauthorized access?

Similarly, while technology has enhanced everything in terms of the digital economy and digital education, it is noted that even traditional moral values are transforming as the digital space expands. Unfortunately, as the digital space is changing rapidly, we are forced to look for universal regulatory tools. Society recognizes the need to use the existing classical foundations for moral and ethical behavior in the new virtual space, as the human factor is preserved in a new dimension (Zevereva, 1-19)

The second indicator under DL is general knowledge and functional skills. (Yoleri and Anadulo 121-134) revealed that in their study, the general knowledge and functional skills according to the gender variable were found to differ significantly by gender. Thus, this means that the general knowledge and functional skill among the respondents in Digital Literacy are quite different in favour of the male students in general knowledge and functional skill and professional production sub-dimensions. As a result of the research, according to the daily internet usage time variable, a significant difference was found between the general knowledge and functional skills sub-dimension of the digital literacy scale scores of the students. This difference is between the students who use the internet daily for 10 hours or more (x = 22.34), and the students who use the internet for 6-9 hours (x = 18.42) and 3-5 hours (x = 18.70). It is seen that the result of the research is compatible with the study of (Goldag 1-10).

The third indicator under digital literacy is daily usage. (Bayrakci and Narmanlioglu 1-2) describes that daily usage consists of e-citizenship, cloud technologies, online broadcasting, and digital transactions. E-citizenship refers to the self-monitored habits that sustain and improve the digital communities which people enjoy or depend on. Some examples include safe and respectful use of e-mail and social media, and a commitment to high standards of information literacy by refraining from spreading misinformation online. Cloud technologies give users access to storage, files, software, and servers through their internet-connected devices: computers, smartphones, tablets, and wearables. Cloud computing providers store and process data in a location that's separate from end users.

On the other hand, online broadcasting is typically delivered through platforms that are internet-based, such as websites, social media, podcasts, and streaming services (Chukwu 74-75). Moreover, digital transactions are payments that happen entirely digitally or online, without the need for a tangible exchange of money. This means that both the provider and the recipient exchange money via electronic means (Mandal 1). Digital payment technology is regarded as essential to any country's ability to compete

globally, especially in the Asian market (Cooke 1). Electronic payment E-payment has become increasingly popular for online shopping in today's world. E-payment is an essential part of e-commerce transactions, including electronic payment for buying and selling goods or services offered by organizations over the Internet.

The fourth indicator under digital literacy is advanced production. This refers to the software, project development and coding. The Fifth indicator under digital literacy is privacy and security. Privacy and security entail personal data protection, avoiding phishing, privacy settings and creating a strong password. The Sixth indicator under digital literacy is the social dimension. This covers individual media broadcasting, content creation management, web design and publishing and collaboration (Bayrakci and Narmanliogle, 1-2).

Writing skill is a hard skill among others because it requires more concern about it, and we need to follow some rules that are related to every single step, they are word choice, coherence, correlation, and grammar. The students should choose the proper word to express the meaning so that the readers catch the information they wrote. The information of each paragraph, the main idea, and the researcher's argumentation should be coherent. Grammar also plays an important role in writing. The use of correct grammar will not confuse the readers. Moreover, the error of using grammar will make a serious misunderstanding for the readers. The success of learning writing does not depend merely on the students, but it needs a teacher's contribution to reach the learning of English writing (Sa'adah 21).

Similarly, the study conducted by (Dastgeer and Afzal 1316) revealed that writing skill is one of the foundations of communication. In addition, students should master this skill since writing skills are as important as used for the evaluation of their academic achievements. However, due to some pressing issues and concerns, they find it difficult to acquire competency because of many reasons; the conventional teaching method being used as one of the causes, aside from the technicalities in writing, like organization, coherence, grammar, etc.

The first indicator, Writing Skills, is attitudes towards writing. Şimşek and Müldür 96-98) examined the relationship between secondary school students' attitudes toward their Turkish course, their reading attitudes, and writing attitudes. Their findings revealed significant positive relationships among these variables. Notably, writing attitude partially mediated the relationship between attitudes toward the Turkish course and reading attitudes, suggesting that fostering positive writing attitudes can enhance overall language learning and academic achievement.

The second indicator under Writing Skill is generating ideas. According to (Melkamu Alemu 40-41), as cited from the study of (Dyson, 2004) emphasized the importance of pre-writing strategies in enhancing students' ability to generate ideas. The research implemented techniques such as brainstorming, clustering, free-writing, and questioning among first-year computer science students at Haramaya University. Findings revealed that these strategies not only sparked students' interest but also enabled them to develop sufficient ideas for their writing tasks. Among the techniques,

brainstorming was identified as the most effective, helping students think exhaustively about their topics before commencing the actual writing process.

Another study conducted in the same year by (Sary Eka Wahyuni and Nina Inayati 92) explored the challenges students face in generating ideas during research proposal writing. The study highlighted difficulties in topic development, identifying theoretical frameworks, and evaluating credible sources. These challenges often stem from a lack of understanding of how to connect research ideas with relevant theories and assess the quality of sources. The researchers suggested that providing constructive feedback and teaching students how to evaluate quality resources are essential steps in overcoming these hurdles.

The third indicator under writing skill is revising. Also, in 2024, a study by (Munaiseche et al. 124-136) highlighted the significance of feedback and revisions in developing writing skills among second-language learners. The systematic review of studies from 2014 to 2022 revealed that various feedback and revision techniques, such as utilizing platforms like WhatsApp and Zoom for peer reviews, are beneficial. These methods enable learners to actively monitor and evaluate their writing progress, leading to improved writing proficiency. The study also noted that users improved over time, suggesting that adaptive writing support systems can enhance students' self-regulated learning and writing skills (Mouchel et al. 2-3).

Finally, the last indicator of writing skill is editing. Editing is the process of checking and re-checking the draft to make it more standard, formal, and error-free, and give it academic sense, making it ready for final publication (Paudel 2) as cited from the study of Brookes and Marshall, who define editing as the process of changing something imperfect into perfect by wasting time on the draft of the first round. In the same context, (Paudel 2) writes that editing is a process of correcting and adapting the particular academic text.

3. Material and Methods

The target population of the research study was the three hundred (300) first-year English major students from the College of Teacher Education in private colleges in Davao City. The students were selected using stratified random sampling. This technique was typically used when evaluating data from different subgroups or strata, allowing the researchers to obtain a sample population that best represented the entire population being studied (Noor et al. 78–82).

To ensure there was no bias in the selection of respondents and to maintain equal representation for all variables, the researcher considered the following selection criteria: (1) the student was a first-year college student and a bonafide member of the first-year English major program in private colleges in Davao City; (2) the student was enrolled in the current school year; and (3) the student was willing to participate in the study. The researcher excluded students who explicitly declined to participate. Additionally, students who chose to withdraw or back out during the administration of the survey

questionnaires were also excluded. The study had 300 respondents and was conducted among first-year college English major students from private colleges in Davao City.

Finally, these students were selected as part of the study because they were more connected and associated with digital literacy and writing skills, as well as linked with independent learning or self-directed readiness in their field of study and specialization. This section of the study discusses the instruments used to collect quantitative data from the respondents and participants. There would be three sets of questionnaires adapted from different authors and would be validated by experts on questionnaire construction. The questionnaires would be crafted with conciseness and coherence in mind.

The Digital Literacy questionnaire was adapted from Bayrakci and Narmanlioglu (2021), and it includes five key indicators: information literacy, technical skill, communication skill, digital skill, and innovative skill. To assess responses, a five-point Likert scale was used. A mean score ranging from 4.20 to 5.00 indicates a Very High level of digital literacy, meaning the skill is always manifested. Scores from 3.40 to 4.19 are interpreted as High, suggesting that digital literacy is manifested most of the time. A Moderate level, with scores between 2.60 and 3.39, implies that digital literacy is occasionally evident. Scores between 1.80 and 2.59 reflect a Low level, where digital literacy is shown in only a few instances. Lastly, a score from 1.00 to 1.79 indicates a Very Low level, meaning digital literacy is not manifested at all.

For Writing Skills, the questionnaire was based on the framework developed by (Elbow and Belanoff 1). It covers four dimensions: attitudes toward writing, generating ideas, revising, and editing. The same five-point Likert scale was used for interpretation. A score from 4.20 to 5.00 is categorized as Very High, signifying that all writing skill indicators are always evident. Scores from 3.40 to 4.19 are considered High, meaning the indicators are evident most of the time. Scores within 2.60 to 3.39 fall under Moderate, indicating occasional manifestation. A range of 1.80 to 2.59 is interpreted as Low, where indicators appear in only a few instances, and 1.00 to 1.79 denotes a Very Low level, indicating the indicators are not evident at all.

The Self-Directed Learning Readiness (SDLR) scale was adapted from Fisher and King (8), focusing on three main indicators: self-management, desire for learning, and self-control. The same interpretation scale was used. A mean score between 4.20 and 5.00 reflected a Very High level of readiness, indicating that these traits were always manifested. Scores from 3.40 to 4.19 indicated a high level, suggesting frequent manifestation. Scores from 2.60 to 3.39 were labeled as Moderate, representing occasional manifestation of self-directed learning traits. Low levels fell within the 1.80 to 2.59 range, while a Very Low score between 1.00 and 1.79 indicated that the traits were not present at all.

In this study, the data were collated and subjected to statistical analysis using a descriptive-correlation design. This technique was a non-experimental design in which the researcher examined the relationship between two or more variables in a natural setting without manipulation or control. The descriptive-correlation design measured two or more relevant variables and assessed the relationship between or among them

(Schmitz 2012). In correlational studies, the researchers examined the strength of relationships between variables by determining how a change in one variable was correlated with a change in another (Curtis et al. 20–25).

Additionally, mediation analyses were employed to understand a known relationship by exploring the underlying mechanism or process through which one variable influenced another variable via a mediator variable (Baron and Kenny 1173–1182). Mediation analysis also helped in understanding the relationship between an independent and a dependent variable through a mediator. The mediating effect of SDLR on the relationship between Digital Literacy and Writing Skill was described and examined. The survey method was employed using an adapted survey questionnaire with a five-point Likert Scale.

The following steps were undertaken in gathering the data for the study. First, asking permission to conduct the study, the researcher wrote a formal letter to the Dean of the Graduate School of the University of Mindanao to seek approval to conduct the research among first-year English major students from selected private colleges in Davao City. Once permission is granted, the next step would involve the administration and retrieval of questionnaires. With the approval and full support of the Dean of the College, the researcher thoroughly explained to the students and their teachers the proper way of answering the given questionnaires. During the actual administration, each question and indicator would be translated into the respondents' dialect to ensure full comprehension and accuracy of responses. All randomly selected CTE students were requested to answer the instrument. After the respondents had completely and honestly filled out the questionnaires, the researcher collected all the completed forms.

The final step involves the gathering and tabulation of data. After the successful administration and retrieval of the questionnaires, the data were collated, organized, and tabulated. Appropriate statistical tools were employed to analyze and interpret the data. Upon completion of data collection, the researcher obtained sufficient information from the survey responses, which would be systematically sorted, compiled, and subjected to statistical analysis for further interpretation and discussion.

The following statistical tools were utilized in the analysis of data for this study. First, the mean was used to describe the level of digital literacy, writing skill, and self-directed learning readiness among first-year college English major students in selected private colleges in Davao City. Next, the Pearson r was employed to determine the significance of the interrelationship among digital literacy, writing skills, and self-directed learning readiness. Furthermore, path analysis was applied to establish the causal modeling by examining the direct and indirect relationships between digital literacy and writing skills, the connection between digital literacy and self-directed learning readiness, and the link between self-directed learning readiness and writing skills.

4. Results and Discussion

4.1 Level of Digital Literacy

Shown in Table 1 are the levels of digital literacy among first-year English Major students: ethics and responsibility, general knowledge, daily usage, advanced production, privacy and security and social dimension.

Table 1: Level of Digital Literacy of First-Year English Major Students

Indicators	Mean	S.D.	Descriptive level
Ethics and Responsibility	4.333	0.588	Very High
General Knowledge	3.299	0.943	Moderate
Daily Usage	3.799	0.696	High
Advance Production	2.770	1.126	Low
Privacy and Security	4.373	0.937	Very High
Social Dimension	3.475	0.996	High
Overall	**3.779**	**0.584**	**High**

The overall mean of digital literacy is (M = 3.779; SD = .584), which is high or manifested very often, while the standard deviation indicates moderate variability among students' digital literacy levels. The indicator ethics and responsibility obtained a very high mean of 4.333 (SD = 0.588), which always manifested, indicating that students consistently demonstrate strong ethical digital behavior, with low variability suggesting generally shared practices in responsible online conduct. On the other hand, general knowledge recorded a moderate mean of 3.299 (SD = 0.943), which means manifested sometimes, implying that students vary widely in their understanding of fundamental digital concepts; the high SD suggests uneven familiarity with basic digital operations. Moreover, daily usage, the high mean of 3.799 (SD = 0.696), which means manifested very often, shows that students frequently use digital tools, though the moderate SD indicates some variation in their daily engagement. In contrast, advanced production yielded a low mean of 2.770 and the highest SD of 1.126, which means it rarely manifested, reflecting substantial differences in students' ability to perform advanced digital tasks such as content creation or multimedia editing; this large variability signals a need for targeted skill-building interventions. Privacy and Security achieved a very high mean of 4.373 (SD = 0.937), which always manifested, showing strong awareness of online safety practices, though the relatively high SD suggests that some students are still less confident or consistent in protecting their personal information. The Social Dimension, with a high mean of 3.475 (SD = 0.996), indicates active digital social interaction for most students, but the high SD suggests unequal levels of collaboration and communication skills in online spaces.

The high overall mean of digital literacy is supported by Ng (2012), who noted that while students can effectively navigate basic digital environments and follow proper online conduct, they still need additional support and instruction to enhance their higher-order digital skills, such as creating complex digital content or engaging in advanced

online problem-solving. Moreover, this is supported by the study of (Ghomi and Redecker 521-535), who suggest that when students demonstrate high levels of digital literacy across multiple dimensions—such as ethical use, communication, and everyday functional skills—they are better equipped for academic success and autonomous learning.

The result of the ethics and responsibility indicator received a very high rating—meaning it is always manifested—indicating that students are aware of proper ethical behavior online, including respecting intellectual property, avoiding plagiarism, and communicating respectfully. This aligns with Kwon's study, which found that integrating digital literacy instruction with internet-ethics education significantly enhances students' ethical awareness and responsible online conduct (Kwon 321). Additionally, Eshet (2021) emphasized that high digital literacy is reflected in students' consistent and effective use of digital tools for communication and daily activities, noting that ongoing engagement with technology strengthens practical digital competencies.

On the other hand, general knowledge is moderate, manifested sometimes, reflecting that while students possess a foundational understanding of digital concepts, there may be gaps in their theoretical knowledge of digital tools, emerging technologies, and their broader applications. This implies a need for more formal instruction to strengthen conceptual understanding and contextual knowledge. Added, the findings were supported by the study of Spante et al. (1-2), variability in foundational digital literacy knowledge among higher-education students. Moreover, the general knowledge dimension, which has a moderate score or manifests sometimes, resonates with the findings of Kaya and Korucuk (2022), who reported that undergraduate students exhibited only moderate competence in functional digital skills and information-handling abilities. Their study suggested that even though students use digital tools frequently, their depth of conceptual understanding and digital knowledge remains only average (Kaya and Korucuk 175). Additionally, Göldağ (2021) found a similar moderate level of digital literacy among university students in Turkey, especially in areas of digital data security awareness and basic ICT knowledge, indicating a need for more structured digital education (Göldağ 82).

Moreover, daily usage is high or manifested very often, suggesting that first-year English major students frequently engage with digital tools and platforms for everyday academic and personal tasks, such as browsing, communication, research, and basic digital applications, while the standard deviation indicates that most students consistently demonstrate this behavior. Moreover, Getenet et al. (2024) found that students who frequently use technology and their engagement in online learning are more often reported to have higher digital-literacy confidence and greater involvement in academic tasks online. In addition, Cancer, Tominc, and Rozaman (2025) revealed that students who use digital tools in a strategic and goal-oriented fashion, not just habitually, are more likely to experience improved academic outcomes. Their data indicate that regular, purposeful usage of digital technology (for research, collaboration, content

consumption, etc.) significantly contributes to learning effectiveness and enhances students' overall digital literacy.

The lone interesting finding was low, which means manifested rarely in advance production, indicating that students are less proficient in creating complex digital content, such as multimedia presentations, web content, or advanced digital projects. The high variability shows that some students may excel while others lag behind, signaling a potential area for targeted instructional support. Enhancing skills in advanced digital production will empower students to not only consume but also create and innovate using digital technologies. This finding is consistent with the study of (The Future of Digital Literacy), which highlighted that many learners exhibit underdeveloped skills in advanced digital production, such as creating multimedia and complex digital content.

Further, the low rating or manifested rarely in advance production is supported by Ng (2012), who notes that while learners are comfortable with basic digital functions, they often struggle with higher-order digital creation skills such as multimedia production and complex content generation. Likewise, Hobbs (2020) explains that advanced digital production requires not only technical skills but also critical thinking, creativity, and mastery of multiple digital tools—skills that students frequently lack without structured opportunities for practice. These authors reinforce the finding that students typically exhibit lower proficiency in advanced digital production.

In addition, the very high or always manifested findings in privacy and security aligned with Park's (2023) research, which showed that higher levels of digital literacy—including familiarity with Internet technologies, awareness of institutional practices, and understanding of privacy policies—strongly predict more responsible and privacy-conscious online behaviors (Park 221). Similarly, Livingstone, Haddon, and Görzig (2021) highlight that young people today are more conscious of managing their digital footprints and safeguarding personal information due to increased exposure to digital safety education. Complementing this, Çebi and Reisoglu (2020) argue that understanding privacy settings, secure password practices, and information-sharing risks has become a core component of modern digital literacy, leading students to demonstrate stronger competencies in this area. These authors collectively support the finding that students exhibit very high levels of privacy and security awareness.

Finally, the result of the social dimension is high or manifested very often, indicating that students are generally skilled at using digital tools to interact, collaborate, and communicate with others in online environments. This suggests they are capable of engaging in participatory digital practices and leveraging social platforms to enhance learning. Jenkins et al. (2020) emphasize that participatory cultures foster collaboration and knowledge sharing among learners, while Rheingold (2021) highlights the importance of digital literacy in social networking and online civic engagement. Additionally, Greenhow and Lewin (2020) note that social digital skills enable students to build learning communities and maintain meaningful interactions in virtual spaces.

4.2 Level of Writing Skills

Table 2 shows the level of writing skills of first-year English major students defined by the following indicators: attitudes towards writing, generating ideas, revising and editing.

Table 2: Level of Writing Skills of First-Year English Major Students

Indicators	Mean	S.D.	Descriptive level
Attitudes towards writing	3.667	0.727	High
generating ideas	3.664	1.043	High
Revising	3.633	0.569	Moderate
Editing	3.464	0.787	Moderate
Overall	**3.607**	**0.573**	**High**

The overall mean of writing skill is (M = 3.607; SD = .573), which is high or manifested very often, while the standard deviation indicates the degree of variability or spread in the students' writing skill scores. The results revealed that students demonstrate high levels in both attitudes toward writing (M = 3.667, SD = 0.727) and generating ideas (M = 3.664, SD = 1.043), which means manifested very often, suggesting that they are motivated, positive, and capable of developing relevant concepts when beginning a writing task. However, the higher standard deviation for generating ideas indicates greater differences among students in this skill. In contrast, revising (M = 3.633, SD = 0.569) and editing (M = 3.464, SD = 0.787) fall within the moderate level or manifested sometimes, implying that while students can review and correct their work, they do not consistently apply revising and editing strategies with high competence. These areas appear to be weaker compared to their attitudes and idea generation.

The overall findings of the study on writing skills align with the earlier research of Hyland (129–133), which highlights the importance of writing competence in achieving academic success and effective communication, especially within English language education. Since writing serves as a fundamental skill for both academic and professional growth, the high proficiency levels observed among the students indicate their strong readiness and reflect the effectiveness of the instructional methods and writing curriculum implemented. In addition, Graham and Perin (2007) stated that students who demonstrate strong abilities in generating ideas, maintaining positive writing attitudes, and applying effective revision processes tend to achieve overall higher writing performance.

The high or manifested very often result of attitude towards writing demonstrates strong writing skills, which means positive attitudes motivate students to engage actively in writing tasks and persist in developing their skills, supporting Kadel's observation that practices like brainstorming, revising, and editing enhance writing competence (Kadel 1-8). On the other hand, (Ruswandi, Gumelar, and Rayhani, 9-19) on the study Investigating Students' Attitudes Toward Writing Assignments Through Social Media E-Portfolio documented that students who hold positive attitudes toward writing assignments — including through modern tools like social-media-based e-portfolios —

are more engaged and motivated, which supports the idea that attitude influences willingness to write and persist in writing tasks. Finally, Julmukya, Sujarwati, and Sofyan (1-13) reported a very strong positive correlation between positive writing attitudes and academic writing competence, indicating that students who value and enjoy writing tend to perform better.

As a matter of fact, the high score or manifested very often in generating ideas, suggests that students are generally proficient in brainstorming, exploring topics, and developing initial concepts for their writing. This indicates confidence in drawing on prior knowledge, connecting ideas, and producing relevant content at the start of a writing task. Khamouja (1–11) highlights the importance of effectively developing ideas, while Flower and Hayes (1981) emphasize that revision plays a crucial role in enhancing clarity and coherence. Similarly, O'Neill (2–9) notes that revising drafts contributes significantly to overall improvement. Despite this strong performance, there are still notable differences among students in their ability to generate ideas.

Additionally, the moderate score or manifested sometimes on revising suggests that students demonstrate a basic capacity to re-examine and improve their drafts, yet their revision practices remain inconsistent or underdeveloped. Recent research confirms that revision is a critical, yet challenging, stage of writing that many students struggle to exploit fully. This was emphasized by (Krafter 2023) -style using assistive tools with children shows that revision—especially when aided by technology or structured feedback—improves composition quality significantly. Similarly, a longitudinal study of L2 writers in academic-writing programs finds that many learners exhibit limited engagement in deep revisions (e.g., reorganizing arguments or enhancing clarity), even after instruction and feedback sessions. Also, Dorji (55-67) revealed that integrating mini-revision lessons and targeted feedback can help students refine content, coherence, and overall writing quality — highlighting that revision skills improve with guided practice. Lastly, Flower and Hayes (1981), revision is a crucial cognitive process where writers refine their drafts to improve clarity, coherence, and overall quality; however, a moderate level suggests that students may focus more on minor corrections rather than deep content improvement. Moreover, research indicates that integrating mini-revision lessons and targeted feedback can help students refine content, coherence, and overall writing quality, highlighting that revision skills improve with guided practice.

Finally, the moderate score or manifested sometimes for editing indicates that these skills are occasionally evident among students but not yet consistently demonstrated. Moreover, a 2022 study published in Zhang et.al found that when students participate in online peer editing—giving and receiving comments and corrections—their academic writing, including mechanical accuracy and overall structure, improves significantly. In addition, this result is supported by the study of (Dela Cruz 52-64), which showed enhancements in organization, mechanics, and language use when multiple drafting (including editing) was part of instruction. Lastly, action-research implementing self-editing techniques in writing classes found that students' composition scores rose markedly when they learned to self-edit and correct

their own drafts, indicating that editing ability develops through regular and guided editing practice (Sangeetha 1-14).

4.3 Level of Self-Directed Learning Readiness

Table 3 shows the level of self-directed learning readiness of first-year English major students defined by the following indicators: self-disciplined, desire for learning, and self-control.

Table 3: Level of Self-Directed Learning Readiness of First Year English Major Students

Indicators	Mean	S.D.	Descriptive level
Self-disciplined	3.692	0.618	High
Desire for learning	4.079	0.629	Very High
Self-Control	4.082	0.593	Very High
Overall	**3.951**	**0.524**	**High**

The overall mean of self-directed learning readiness is (M = 3.951; SD = .524), which is high or manifested very often, while the standard deviation indicates relatively low to moderate variability among the students' responses. The result of self-discipline (M = 3.692, SD = 0.618; High), which means manifested very often, means students demonstrate the ability to manage their tasks and responsibilities effectively, although there is moderate variation among individuals, suggesting that some students may require additional support in maintaining consistent study habits. Moreover, indicators desire for learning (M = 4.079, SD = 0.629; Very High) and self-control (M = 4.082, SD = 0.593; Very High), which means they always manifested, reflecting that students are highly motivated to learn and capable of regulating their behavior and focus during academic activities, with responses showing only slight variability.

The overall findings for self-directed learning (M = 3.951, SD = 0.524; High) or manifested very often indicate that most students are generally prepared to take responsibility for their own learning, set goals, and monitor their progress, with the standard deviation suggesting that while most students are similar in readiness, minor differences exist among individuals. These results imply that first-year English majors are largely capable of independent learning, yet targeted guidance in self-discipline may further strengthen their overall self-directed learning skills. It is imperative to note that self-discipline scored slightly lower; it still reflects a commendable level of personal responsibility and goal-oriented behavior. This aligns with the study of Cazan and Schiopca (640-644), who found that self-discipline and self-regulation are strong predictors of academic achievement and persistence in higher education settings (Cazan and Schiopca, 46). Therefore, first-year English major students perceived a high level of self-directed learning readiness. Additionally, this result is confirmed in the study of Bontisesari, Banus and Marithasari (2020) that students with a high overall self-directed learning readiness are likely to be more autonomous and proactive in their learning, capable of setting goals, managing their time, and monitoring their own progress without constant guidance.

Indicator self-discipline with the result of high or manifested very often, indicates that students can effectively manage their study habits, maintain focus, and organize their academic responsibilities, reflecting their ability to regulate behavior in pursuit of learning goals. This is consistent on the study of Riza Noviana Khoirunnisa et al. (2024) describe academic self-control as students' ability to regulate behavior, maintain norms, and resist distractions, highlighting disciplined behavior as critical during emerging adulthood. On the other hand, the result is supported by the study by John Mart Elesio (2023) found that self-regulated learning strategies — including disciplined planning and time management — have a positive influence on college students' academic outcomes. Finally, a study by Ali Pala and Basibuyuk (2023) shows that self-control and motivation — aspects closely related to self-discipline — significantly predict academic achievement in science and technology learning contexts.

The very high score or manifested very often for desire for learning suggests that students are intrinsically motivated to acquire knowledge and actively engage in academic tasks. This aligns with the study of Fisher, King, and Tague (2001), who highlight that internal motivation plays a crucial role in fostering lifelong learning (Fisher, King, and Tague 517). The result also is supported by the study Jun Wu, Shuoli Qi, and Yueshan Zhong (2022) found that among high school students, profiles with high intrinsic motivation and need for cognition were associated with higher academic achievement, including in English and science subjects. Lastly, Sonia Almwalad (2023) in her dissertation shows that academic motivation (intrinsic and extrinsic) plays a significant role in online learning success and overall academic performance, demonstrating that desire for learning remains relevant in modern, digital learning contexts.

Finally, the result of high or manifested very often rating for self-control shows that students are capable of maintaining concentration, resisting distractions, and persisting through challenges, supporting Garrison's (1997) assertion that self-management is an essential component of self-directed learning (Garrison 21). Hence, these results suggest that first-year English majors demonstrate motivation, independence, and strong self-regulatory skills—qualities important for academic success and lifelong learning. Riza Noviana Khoirunnisa et al. (2024) report that many university students exhibit high academic self-control, enabling them to adapt their learning behavior and maintain focus on tasks despite external demands or temptations. Similarly, Angrainy et. al (2024) found a significant positive relationship between self-control and learning achievement among students, underscoring how self-control supports better academic performance. Additionally, the recent review by Aris Karagiorgakis and Samantha Long-Mitchell (2023) highlights that self-regulation — including self-control — helps maintain academic performance even under adverse circumstances such as traumatic events, showing resilience and sustained focus among highly self-regulated students.

4.4 Correlation between Digital Literacy and Writing Skills

Table 4 shows the correlation between independent variable (digital literacy) and dependent variable (writing skills) of first year English major students.

Table 4: Correlation between Digital Literacy and Writing Skills of First Year English Major Students

Variable	Ethics and Responsibility	General Know. And Functional Skills	Daily Usage	Adv. Production	Privacy And Security	Social Dimension	IV
Attitudes Towards Writing	0.407 <.001	0.117 0.064	0.186 0.003	0.060 0.346	0.311 <.001	0.116 0.066	0.288 <.001
Generating Ideas	0.164 0.010	0.101 0.110	0.101 0.111	0.104 .100	0.070 0.267	0.038 0.550	0.141 0.026
Revising	0.494 <.001	0.209 <.001	0.363 <.001	0.086 0.175	0.319 <.001	0.214 <.001	0.412 <.001
Editing	0.294 <.001	0.327 <.001	0.332 <.001	0.234 <.001	0.141 0.026	0.229 <.001	0.388 <.001
DV	0.427 <.001	0.247 <.001	0.309 <.001	0.168 0.008	0.258 <.001	0.186 0.003	0.391 <.001

The first bivariate correlation between digital literacy and writing skills yielded an r-value of 0.391 ($p<.001$), which indicates a moderate positive and statistically significant correlation between overall digital literacy and overall writing skills among first-year English major students: as digital literacy increases, writing skills also tend to improve. The result of ethics and responsibility shows a moderate positive correlation with overall writing skill ($r = 0.427$, $p < .001$), indicating that students who demonstrate responsible digital behavior tend to have stronger writing skills. Moreover, general knowledge and functional Skills ($r = 0.247$, $p < .001$) and daily usage ($r = 0.309$, $p < .001$) also show significant positive correlations, suggesting that practical digital competence and frequent digital engagement contribute to better writing performance. In contrast, advanced production has a weaker but still significant correlation with overall writing ($r = 0.168$, $p = 0.008$), while privacy and security ($r = 0.258$, $p < .001$) and social dimension ($r = 0.391$, $p < .001$) indicate that students' awareness of digital privacy and their social interactions online are associated with higher writing skills. Finally, the bivariate analysis demonstrates that higher levels of digital literacy in various dimensions are significantly related to stronger writing skills among students, with all significant correlations showing a positive direction, meaning that as digital literacy increases, writing skills also improve.

These results align with the principles of Connectivism (Siemens & Downes), which holds that learning develops through navigating and forming digital networks. Students with stronger digital literacy are more capable of locating, judging, and synthesizing information from various online sources, which directly strengthens their

ability to revise, edit, and cultivate positive attitudes toward writing. Their digital competence helps them link ideas across platforms, reflecting the interconnected learning processes emphasized in connectivist theory. Furthermore, Vygotsky's Zone of Proximal Development (ZPD) further explains how students rely on digital resources and collaborative technologies as scaffolds that assist them in progressing from basic writing tasks to more complex ones. Thus, the significant correlations between digital literacy and each aspect of writing demonstrate that digital competence not only enhances technical writing abilities but also supports cognitive growth and socially mediated learning—reflecting both connectivist and constructivist views of effective instruction. These conclusions align with previous research emphasizing the essential role of digital competence in developing academic literacy. As Ng (2012) notes, digital literacy includes evaluating information, thinking critically, and creating content—skills that are fundamental in writing. Finally, Spires, Paul, and Kerkhoff (2019) found that students who are digitally skilled exhibit greater confidence and proficiency in revising and editing using digital tools. Bråten and Strømsø (95–122) similarly observed that students with strong digital competence tend to be more motivated and experience less anxiety in writing tasks. Together, these studies highlight that integrating digital literacy into writing instruction leads to stronger writing performance.

4.5 Correlation between Digital Literacy and Self-Directed Learning Readiness

Table 5 shows the correlation between the independent variable (digital literacy) and the mediating variable (self-directed learning readiness) of first-year English major students.

Table 5: Correlation between Digital Literacy and Self-Directed Learning Readiness of First Year English Major Students

	MV value	R-valuep	Interpretation
Ethics and responsibility	0.64	<.001	Significant
General knowledge and functional skills	0.308	<.001	Significant
Daily usage	0.488	<.001	Significant
Advanced Production	0.269	<.001	Significant
Privacy and Security	0.398	<.001	Significant
Social dimension	0.288	<.001	Significant
IV	0.577	<.001	Significant

The second bivariate correlation analysis between digital literacy and writing skills showed a *moderate positive correlation* between overall digital literacy and writing skill, with an overall r-value of 0.577 (p <.001), signifying that students with higher digital literacy tend to exhibit stronger writing performance. From the gleaned result, this suggests that all dimensions of digital literacy are positively and significantly correlated with the self-directed learning readiness of first-year English major students. Among the dimensions, ethics and responsibility have the strongest correlation ($r = 0.640$, $p < .001$), indicating that students who demonstrate responsible and ethical use of digital tools are highly likely to be more prepared for independent learning. Daily usage ($r = 0.488$, p

< .001) and privacy and security (r = 0.398, p < .001) also show moderate positive correlations, suggesting that frequent engagement with digital platforms and awareness of online safety contribute to self-directed learning readiness. General knowledge and functional skills (r = 0.308, p < .001), social dimension (r = 0.288, p < .001), and advanced production skills (r = 0.269, p < .001) exhibit weaker but still significant positive relationships, indicating that technical proficiency, online collaboration, and content creation skills also play a role in supporting independent learning. Overall, the total digital literacy score shows a strong positive correlation with self-directed learning readiness (r = 0.577, p < .001), highlighting that higher overall digital literacy significantly predicts greater capability for students to manage, plan, and take initiative in their own learning. Consistent with the study of Ng (2012), who emphasized that digital literacy equips learners with the ability to manage, evaluate, and create information effectively in digital environments, the findings imply that such competencies enhance students' capacity to take charge of their own learning. Therefore, digital literacy serves as a crucial foundation for fostering self-directed learning readiness among students.

These findings are consistent with the theory of Connectivism as proposed by Siemens and Downes, which underscores that learning develops through digital networks and the ability to navigate online information sources. Students with stronger digital literacy skills are better equipped to locate, assess, and synthesize information across various platforms, enabling them to take greater control of their own learning. Their ethical and responsible engagement in digital spaces further strengthens the reliability of their learning networks, a key aspect of connectivist thinking. Likewise, Constructivist Learning Theory, as described by Piaget and Vygotsky, supports this interpretation by stressing that knowledge is built through active participation and interaction. Therefore, digital literacy is linked and associated with high self-directed learning readiness, which reflects students' capacity to manage, structure, and apply learning experiences—an ability aligned with Piaget's processes of assimilation and accommodation. Vygotsky's notion of the Zone of Proximal Development (ZPD) also clarifies how learners use digital tools and collaborative online interactions as scaffolds that guide them toward increasing independence. Finally, the results affirm the Connectivist perspective of Siemens (2005) and Downes (2008), showing that digital literacy directly strengthens learners' readiness for self-directed learning by enabling them to autonomously access, share, and construct knowledge within digital and social networks.

4.6 Relationship between Writing Skills and Self-Directed Learning Readiness

Shown in Table 6 is the correlation between the dependent variable (writing skills) and the mediating variable (self-directed learning readiness) of first-year English major students.

Table 6: Correlation between Writing Skills and Self-directed Learning Readiness of First-Year English Major Students

Variable	R-value	p-value	Interpretation
Attitudes towards writing	0.454	<.001	Significant
Generating Ideas	0.321	<.001	Significant
Revising	0.521	<.001	Significant
Editing	0.421	<.001	Significant
DV	0.564	<.001	Significant

The data in Table 6 indicate that all dimensions of writing skills are positively and significantly correlated with the self-directed learning readiness of first-year English major students. Among the dimensions, revising shows the strongest correlation ($r = 0.521$, $p < .001$), suggesting that students who are skilled at reviewing and improving their written work tend to have a higher readiness for independent learning. Attitudes towards writing ($r = 0.454$, $p < .001$) and editing ($r = 0.421$, $p < .001$) also demonstrate moderate positive correlations, indicating that a positive mindset toward writing and the ability to correct and refine work contribute to self-directed learning readiness. The result of generating ideas ($r = 0.321$, $p < .001$) shows a weaker but still significant correlation, highlighting that creativity and idea development play a role, albeit smaller, in supporting independent learning. Overall, the total writing skills score is strongly correlated with self-directed learning readiness ($r = 0.564$, $p < .001$), indicating that higher writing proficiency significantly enhances students' capability to manage, plan, and take initiative in their learning.

This finding supports Zimmerman's (2008) Self-Regulated Learning Theory, which asserts that students who consistently plan, monitor, and assess their learning processes tend to perform more effectively. In this context, strong writing skills appear to directly enhance self-directed learning readiness, as students with better writing abilities are more capable of organizing their thoughts, setting goals, and reflecting on their academic progress—core behaviors emphasized by Zimmerman (166–183). Aligned with this theoretical perspective, studies by Adnan as well as Agbayani and Janfeshan (79-80) demonstrate that students with stronger writing abilities tend to show higher levels of self-directed learning readiness. Their findings suggest that as learners develop more advanced writing skills, they also become more capable of regulating their learning, setting personal goals, and independently applying strategies that enhance their writing performance. Adnan notes that students who are already proficient writers are more inclined to use self-directed learning approaches to further improve their work, while Agbayani and Janfeshan (79) likewise report that engaging in self-directed learning methods leads to measurable gains in writing performance across different proficiency levels. Together, these studies emphasize that writing skills not only benefit from self-directed learning but also play a direct role in strengthening learners' readiness to engage in self-directed learning practices.

This result is supported by Socially Shared Cognition Theory (SSCT), which highlights that learning improves when cognitive processes, strategies, and knowledge

are shared within a social context. Applied to the context of writing, students who participate in collaborative activities—such as exchanging feedback, discussing ideas, or jointly revising texts—tend to strengthen essential self-regulatory traits like self-discipline, self-control, and motivation. These socially supported writing practices help learners become more independent and capable of directing their own learning. Thus, writing skill contributes directly to self-directed learning readiness, as the socially interactive nature of writing development equips students with the regulatory abilities needed to manage and guide their learning more effectively.

Lastly, this validates the theory of Constructivist Learning Theory of Piaget and Vygotsky, which posits that learners actively construct knowledge through interaction, reflection, and social collaboration—processes essential to writing development and self-directed learning (Piaget 1954; Vygotsky 1978).

4.7 Mediation Analysis of Self-directed Learning Readiness

Displayed in Table 7 is the Mediation Analysis of Self-directed Learning Readiness. The mediation analysis shows that the direct effect (0.169, p = 0.121) of the independent variable on the dependent variable is not statistically significant, whereas the indirect effect through the mediator (0.501, p < .001) is highly significant, indicating that the mediator plays a crucial role; consequently, the total effect (0.669, p < .001) is also significant, suggesting that the independent variable positively influences the dependent variable primarily through the mediating pathway.

Table 7: Mediation Analysis on the Relationship of Digital Literacy and Writing Skills as Mediated by Self-directed Learning Readiness

Effects	Estimates	Std. Error	Z-value	p	95% Confidence Interval	
					Lower	Upper
IV-DV	0.169	0.109	1.551	0.121	-0.045	0.382
IV-MV-DV	0.504	0.007	6.486	<.001	0.349	0.652
IV-DV	0.669	0.100	6.718	<.001	0.474	0.865

4.8 Direct Effects Interpretation

The direct effect of Digital Literacy on Writing Skill yielded an unstandardized estimate of 0.169 (p = 0.121), which was not statistically significant at the 0.05 level. This indicates that when controlling for the mediating variable (Self-Directed Learning Readiness), digital literacy alone did not significantly predict writing skill. The confidence interval [−0.045, 0.382] included zero, further reinforcing the non-significance of this direct effect. This finding aligns with Getenet et al. (2–20), who argued that while digital literacy enhances learning environments, its influence on specific academic skills such as writing is often indirect and mediated by learners' self-regulatory and motivational factors. These findings support the theory of Connectivism (Siemens & Downes). This result suggests that mere access to digital tools and information is insufficient to improve writing performance directly. Learning is mediated by the ability to connect, process, and apply knowledge within digital networks, emphasizing that digital literacy supports writing

only when learners actively engage with information and manage their learning. Finally, Constructivist Learning Theory (Piaget & Vygotsky) supports the notion that cognitive development and skill acquisition depend on active knowledge construction. Writing skills are developed through interaction with content, reflection, and scaffolding rather than through exposure to digital tools alone.

4.9 Indirect Effects Interpretation

However, the indirect effect of Digital Literacy on Writing Skill through Self-Directed Learning Readiness was statistically significant, with an estimate of 0.501 ($p < .001$). This strong indirect effect suggests that digital literacy positively influenced students' writing skills by first enhancing their self-directed learning readiness. The 95% confidence interval [0.349, 0.652] did not include zero, supporting the mediation effect, meaning that self-directed learning readiness fully mediated the relationship between digital literacy and writing performance. This aligns with Geng, Law, and Niu (5), who found that digital literacy enhances learners' autonomy and self-directed learning capacity, which in turn leads to improved academic outcomes, including writing proficiency. This finding supports the theory of Connectivism (Siemens & Downes). This result can be explained by the idea that learning occurs through forming networks and connections. Students with higher digital literacy are able to access, evaluate, and integrate information from diverse digital sources, using these networks to guide and regulate their own learning. Their enhanced self-directed learning readiness reflects the ability to navigate these connections effectively, which then translates into improved writing skills. Also, Constructivist Learning Theory (Piaget & Vygotsky) provides a framework for understanding this mediation. According to Piaget, learners actively construct knowledge through cognitive processes such as assimilation and accommodation, while Vygotsky emphasizes the role of social interaction and scaffolding in learning. In this case, self-directed learning readiness represents the students' capacity to apply, refine, and internalize knowledge obtained from digital resources. By managing their learning processes independently, students engage in meaningful construction of writing skills, supported by both cognitive development and guided learning within their social and educational environment.

4.10 Total Effects

The total effect of Digital Literacy on Writing Skill, combining both direct and indirect influences, is significant (estimate = 0.669, $p < .001$). This means that overall, digital literacy has a meaningful and positive effect on writing skill development, but this effect primarily operates through improvements in students' self-directed learning readiness, rather than through a direct influence alone.

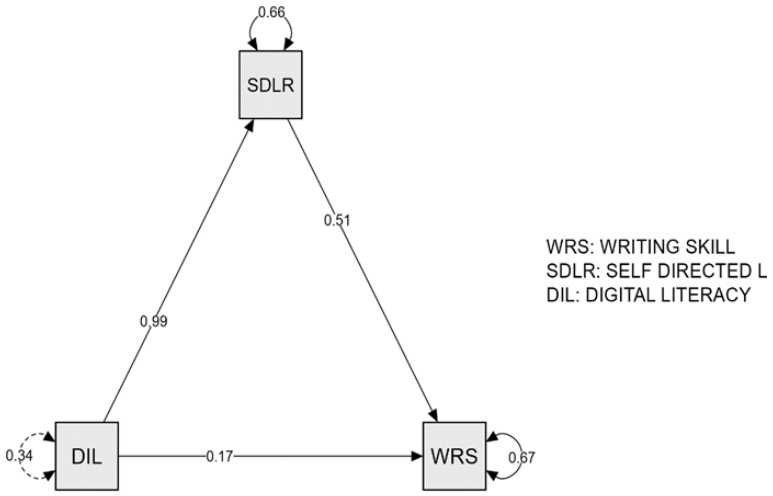

Figure 1: Path Coefficients

The path from Self-Directed Learning Readiness to Writing Skill shows a statistically significant and strong positive effect (Estimate = 0.507, $p < .001$). This indicates that higher levels of self-directed learning readiness are associated with better writing skills. The 95% confidence interval [0.382, 0.632] does not include zero, confirming the robustness of this effect. This implies that when learners are more prepared to take initiative and responsibility for their learning, their writing performance significantly improves. This finding is consistent with Zimmerman and Bandura (1994), who asserted that self-regulated and self-directed learners tend to produce higher-quality written work due to their goal-setting, monitoring, and revision strategies. Moreover, this result aligns with the Constructivist Learning Theory of Piaget and Vygotsky, which emphasizes that learners actively construct knowledge through interaction, reflection, and collaboration, thereby enhancing complex skills such as writing (Piaget; Vygotsky). The direct path from Digital Literacy to Writing Skill has an estimate of 0.169, but it is not statistically significant ($p = 0.121$), with a confidence interval that includes zero [−0.045, 0.382]. This suggests that digital literacy alone does not have a direct influence on writing skill once self-directed learning is considered in the model. While digital literacy may still play a role, its impact on writing appears to be mediated rather than direct. This conclusion aligns with the findings of Geng, Law, and Niu (2019), who reported that digital literacy substantially enhances students' self-directed learning abilities, thereby improving their academic and communication performance (Geng, Law, and Niu 5). Furthermore, this finding supports the Connectivist Theory proposed by Siemens and Downes, which posits that learning in the digital age occurs through the ability to connect with information networks and digital resources, enabling learners to construct knowledge collaboratively and independently (Siemens; Downes).

Meanwhile, the path from Digital Literacy to Self-Directed Learning Readiness is strong and highly significant (Estimate = 0.987, $p < .001$), indicating that students with greater digital literacy are significantly more likely to exhibit self-directed learning

behavior. The confidence interval [0.814, 1.161] reinforces the strength and reliability of this relationship. This highlights that digital competence equips learners with the necessary tools and mindset to manage their own learning effectively, which, in turn, supports their academic outcomes—particularly in writing. This is consistent with Connectivism, which views digital literacy as central to forming meaningful connections that expand one's capacity to learn autonomously (Siemens 2005), and with Constructivist principles, which emphasize learner agency, collaboration, and reflection as essential elements in developing higher-order skills (Vygotsky 1978; Piaget 1954).

5. Conclusion

Based on the findings, the result revealed that the level of students' overall digital literacy is high, which implies that digital skills are very often demonstrated. Ethics and responsibility, privacy and security yielded the highest score among the indicators, which clearly indicates that students are highly aware of the ethical considerations and responsible behaviors required in digital environments, such as respecting intellectual property, avoiding plagiarism, and protecting personal and sensitive information online. Additionally, students demonstrate high proficiency in daily usage and the social dimension, reflecting their consistent and competent use of digital tools for everyday tasks and effective engagement with digital communities.

Additionally, first-year English major students demonstrate high levels of writing skills in the areas of attitudes towards writing and generating ideas. This implied that students generally have a positive mindset toward writing, valuing it as an important skill, and are capable of effectively producing and developing ideas for their written work. The high scores suggest that students are motivated to engage in writing tasks and possess the creativity and critical thinking needed to generate content. Moreover, self-directed learning readiness results indicate that first-year English major students possess a high level of self-directed learning readiness, with particularly very high scores in desire for learning and self-control, and a high score in being self-disciplined. This suggests that students are motivated, able to manage their behaviors, and take responsibility for their own learning, demonstrating strong readiness for independent and proactive learning.

For the test of correlation between variables, results indicate that digital literacy is significantly associated with self-directed learning readiness among first-year English major students. Specifically, all dimensions of digital literacy ethics and responsibility, general knowledge and functional skills, daily usage, advanced production, privacy and security, and social dimension showed significant positive relationships with self-directed learning readiness at $p < .001$. Therefore, the outcome of digital literacy (IV) score also correlates strongly with self-directed learning readiness (MV). This implies that students who are more competent in navigating digital tools, practicing ethical behavior, managing information, and engaging socially online are better prepared to take initiative, manage their own learning, and exhibit the self-discipline, desire for learning, and self-

control necessary for independent study. Essentially, digital literacy provides a foundation that supports students' ability to regulate and direct their learning processes. Similarly, the result of correlation between writing skills (DV) and self-directed learning readiness (MV) is also significant, with all indicators showing positive relationships: attitudes towards writing, generating ideas, revising, and editing, with the overall writing skills score correlating at $r = 0.564$ ($p < .001$). These findings suggest that students who demonstrate stronger writing abilities are also more capable of self-directed learning, likely because writing requires planning, critical thinking, and reflective skills—core components of self-regulated learning. The implications of these results highlight the interconnectedness of digital literacy, writing skills, and self-directed learning readiness, indicating that interventions aimed at improving students' digital competencies and writing proficiency can concurrently enhance their ability to learn independently, promoting both academic success and lifelong learning habits.

Results show that there is a moderate positive and statistically significant relationship between digital literacy and writing skill. Moreover, this result implies that students who are more digitally literate tend to have stronger writing skills, likely because their ability to access, evaluate, and integrate digital information supports idea generation, organization, and composition in writing. This finding is consistent with Connectivism theory (Siemens & Downes, 2005), which posits that learning occurs through forming and navigating networks, including digital networks, where learners connect, synthesize, and apply knowledge effectively.

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Conflict of Interest Statement
The authors declare no conflicts of interest.

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