



The Effectiveness of Digital Literacy Competence in Enhancing Autonomous Learning and Students' Writing Performance

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Abstract

The aim of this study is to investigate the link between independent learning, digital literacy, and writing performance. The sample of this research was 33 students from pre-intermediate writing class of French Literature Department at Universitas Negeri Semarang. This research used questionnaires for collecting the data of student's independence and digital literacy, while writing test was used to measure the students' writing performance. The Pearson correlation coefficient applied for examining the relations of those three elements. The findings showed that a strong correlation between digital literacy and learner autonomy, digital literacy and writing proficiency, and between autonomous learning and writing proficiency. The findings depicted a strong positive correlation between digital literacy and learner autonomy ($r = 0.606$, $p = 0.05$), a moderate positive correlation between digital literacy and writing proficiency ($r = 0.363$, $p = 0.05$), and a small positive correlation between autonomous learning and writing proficiency ($r = 0.289$, $p = 0.05$). These findings showed the importance of encouraging self-directed learning in French writing education while leveraging technological tools to enhance students' writing skills. Consequently, educators are encouraged to integrate digital literacy initiatives into their teaching practices to support the development of autonomous learners and improve overall writing competency among students.

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INDRODUCTION

Presently, we are living in the 21st century, known also as digitalization era where the internet utilization soaks in every field of human lives, involving varied demographics and disciplines. The rapid dissemination of information and the development of technology encourage all strata, educators, practitioners to be able to adapt of this change in order to steer students towards the 21st-century skills, such as critical thinking, collaborative learning, and problem solving (Sanjayanti et al., 2020; Sekarningrum et al., 2014; Yulianto et al., 2023).

As one of developing country, Indonesia witnessed a significant increase of internet users. Based on Badan Pusat Statistik (BPS, 2020), there was a 22 % growth of internet users in Indonesia between 2015 and 2019. By 2019, BPS reported that approximately 43.5 % of Indonesia's population owned internet access. In contrary, the massive internet utilisation is not followed by a proportional improvement of digital literacy competency which does not involve only the capacity to operate the device, software, and basic internet knowledge, but also includes the capacity to understand, evaluate, and responsibly utilize the data from internet (Azzahra & Felippa, 2021).

These competencies also changes the pedagogical approach, from teacher-center to student center (Abdigapbarova & Zhiyenbayeva, 2023). The present approach permit students to direct their own learning and digital literate, acknowledge their innate proclivity for mastering cutting-edge technologies and online resources to facilitate learning and academic journey. An extensive type of learning materials is available and easy to access for them through online platforms, supporting their education journey.

The assistance of the internet changes the way of people lives that encourage people to be more independence in their learning journey (Najeeb, 2013). This notion emphasizes the mandatory of students to be responsible for their own leaning paths. Dependency gradually transforms into interdependence when people collaborate to strengthen their independence. By doing so, they can see their independence for upgrading their skills, when the teacher is not in the class. From this framework, the conventional paradigm of teacher shifts to a facilitator, resource guide, and collaborative learning companion, based on their experience to support knowledge acquisition (Belton & Scott, 1998). Some researches (Farikah, 2021; Hasyim, 2018) have shown that there are a connection between digital literacy competency on learning effectiveness, alongside the significant influence of independent learning on language acquisition efficacy.

In Asian countries, the autonomous learning amongs students in the secondary school are considered as challenging, except for those who schools in the institution adopting western educational approaches (Lee & Baird, 2021; Maulana et al., 2016). In contrast, the higher education students are viewed as more mature, so that they are more responsible for their own path of learning (ElSayad, 2023). Relevant studies (Andina et al., 2020; Hamouma & Menezla, 2020; Indriyani & Gustia Ningsih, 2022; Sadegh Bagheri & Aeen, 2011) investigated the correlation between students' independence, digital competence, and writing achievement. These researches found that there are a significant correlation. Pascarella-Romano (2020) assessed the influence of a digital literacy curriculum on students' writing abilities. The findings indicated that students who engaged in the digital literacy curriculum exhibited superior performance in English composition evaluations.

Building on the preceding discussion, this research seeks to explore the impact of digital literacy and autonomous learning on the development of French writing skills at the intermediate level. By integrating the principles of digital literacy and independent learning, this study aims to fill a gap in existing educational research. The studies into the application of the concept of digital literacy and autonomous learning in the development of writing skills remain scarce amidst the abundance of such studies in other area of language skills. More specifically, these concepts have not been explored significantly in the development of French language writing skills. This study, thus, is an attempt to fill this gap and tries to answer the following questions:

- 1) Does digital literacy significantly affect the level of autonomous language learning among French literature students?
- 2) Does digital literacy play a crucial role in improving the writing performance of French literature students?
- 3) Does autonomous language learning enhance the writing performance of French literature students?

LITERATURE REVIEW

Digital Literacy

Digital literacy is the capacity to use the diverse modalities responsibly. By means, they not only know how to use, but also possesses the ability to investigate and assess the digital information (Kühn & Cavana, 2012; Kuhn-Brown, 2021; Polizzi, 2020; Tatminingsih, 2022). Zeng (2023a) explains further digital literacy as the ability of students to use digital technologies proficiently and wisely in both learning objectives and everyday. These skills might be significant for the students' life beyond the academic boundary and be fundamental for their roles in digitalized-social settings.

This idea is reinforced by (Eshet-alkalai, 2004) findings, who highlights that digital literacy means more than software operation proficiency per se, it further involves a comprehensive aptitude for complex cognitive, motor, social, as well as emotional skills essential for intensive encounter and adaptation to various digital environment. This would include interpreting instructions from visual interfaces and deploying digital tools to create meaningful content, understanding information through non-linear and hypertextual navigation, identifying the reliability and credibility of information and its sources, and having a sufficient understanding of the common ethics on the online spaces. This relatively new concept of digital literacy can be used as underpinning consideration in designing metric for assessing learners' performance in digital setting and provide researchers as well as developers a more effective platform for designing user-centric environments.

The urgency of application and integration of the concept of digital literacy within the pedagogical context is affirmed by quite an appalling reality showing a lack of presence of this concept in pedagogical environment in Indonesia, as found by Moekahar (2019). Therefore, an immediate attention in this matter needs to be initiated, and thus the stakeholder could take serious actions to help students develop skill sets they need to navigate and thrive in an rapidly increasingly digitalized world.

The realm of digital literacy includes a multitude of synonymous terms, one of which, as defined by (Sharkey & Brandt, 2008), is information technology literacy. This term merges two previously distinct proficiencies. The amalgamation of these proficiencies is imperative for the comprehensive acquisition of requisite skills and knowledge. By synergistically integrating standards and methodologies from both domains, leveraging The Instructional System Design methodology, along with the enhancement of programmatic and curricular frameworks is achieved, attuning education to the exigencies of the digital era.

Autonomous Learning

Independent learners denote the capacity of individuals to govern their own educational processes (Benson, 2008, 2013; Benson et al., 2003; Kuhn-Brown, 2021). The notion of self-directed learning was initially conceptualized by *le Centre de Recherches et d'Applications Pédagogiques en Langues 2* (CRAPEL) or Centre for Language Pedagogic Research and Practice at the University of Nancy, France, in the early 1970s. Henri Holec, then director of CRAPEL, identified the necessity for a term that encapsulates an individual's ability to manage their own learning, thus giving rise to the concept of learner autonomy (Najeeb, 2013). Autonomous learners can be identified by their ability to reflect on their own learning process, meaningfully collaborate with their peers, develop a sense of responsibility, thoroughly understand the objective of the study programs that they take, initiate a learning plan and execute those plans into actions in an effective way, and consistently monitor the efficacy of their learning process (Godwin-Jones, 2019).

Essentially, researchers agree that enhancing the learners' learning autonomy comprises traits such as, a positive disposition, reflective capabilities, and proactive approaches to self-management as well as interpersonal engagement. Fostering this mindset is significant for internalizing a sense of responsibility and preventing the possible dishonest behavior. Such traits are much more significant and pivotal in language learning and acquisition, given that language learning is intrinsically an interactive endeavor working in a social context.

In order to develop their language proficiency, the learners very often have to rely merely on the knowledge transferred by their teachers or tutors in the classroom. Moreover, they must also have a strong commitment to refine their skills by themselves outside the classroom boundary. However, this does not always mean that students are left to encounter the learning difficulties without any guidance. In the independent learning framework, the role of teachers and tutors is to expand the students' options in learning, prioritize the difference needs of the students over institutional and personal interest, and encourage the learners to take responsibility for making decision in their learning process.

The Intersection of Digital Literacy and Autonomous Learning

With the rise of digital technology in learning and education, the learners' digital literacy has become crucial ever since. Sufficient skillsets in digital literacy enable the students to navigate and take control over some fruitful tools that might help them explore and make use of online learning resources, thus promoting autonomy (Littlejohn et al., 2012). Zeng (2023a) also discovered that the students who own relatively higher levels of digital literacy tend to be more motivated to participate in autonomous learning activities. Furthermore, (Azevedo et al., 2010) found that students proficient enough in using digital technologies shows better aptitude in autonomous behaviors, which help them later strengthen their autonomous learning capabilities. Yang & Kim (2015) found out that e-learning, one of the digital tools in learning, minimizes learners' dependency on physical obstacles and potentially tailors the learning contents to the learners' individual needs and levels. Developing an independent learning model requires enhancing digital literacy through interactive and sharing activities in digital environments.

There were four keys for external factors, according to Fernández-Toro & Hurd (2014), that significantly develop autonomous competence: goal relevance, knowledge, self-confidence, and roles. The clear learning goals will make students more engaging. The adequate basic knowledge will become the foundation in acquiring new concepts which also enhance students' involvement. The challenge of autonomous learning is to lead students abilities to consistently use their learning environments independently (Gao, 2019). Autonomous learning and Self-Directed Learning are frequently used synonymously, encompassing structured learning methodologies, effective time management, and strategies for seeking assistance and sustaining motivation (Weinstein et al., 2011). This study also employs these terms interchangeably.

Writing Performance

Writing skills, or "*production écrite*" in learning French are considered challenging because of their productive nature (Casanova, 2011; Chiss & Filliolet, 1984). This means that unlike receptive competency such as *comprehension orale* (listening) and *comprehension écrite* (reading), *production écrite* (writing) requires the active creation of language output, which involves complex cognitive processes and a higher degree of linguistic competence (East, 2017; Stu-Mccarthy, 2018). *Le Cadre européen commun de référence pour les langues* (CECR) (2023) introduces communicative language activities and strategies as a substitute for the traditional four 'skills' model (listening, speaking, reading, writing), which has increasingly proven inadequate in accurately representing real communication. Furthermore, dividing language into these four skills does not accommodate concepts of intention or broader communicative functions. Chiang identified two major components that are crucial for constructing coherent and effective text, namely, intrasentential subscales and extrasentential subscales in relation to writing. Both components are essential for learning foreign languages. Intrasentential parts consist of syntax and morphology. Syntax refers to the rules of sentence formation, word order, agreement, whereas, morphology refers to the structure of words and the way they are inflected or derived. Extrasentential subscales, on the other hand, covers the coherence and cohesion of the text. These give the rational flow and logical unfolding of sentences and paragraphs in a piece of writing. Working with these factors is thus important to attain an appropriate assessment and improvement in writing performance.

The Intersection of Digital Literacy and Autonomous Learning towards writing performance

Having the ability to use technology allows students to achieve high grade in their writing. Digital literacy in this research is defined as the ability to operate digital tools as well as assess digital content critically and relate information from sources in a structured form. Feng (2023) states that digital literacy allows the students to have access to abundant of materials, so they will have many data for composing their essays in turn leading to better quality in academic writings. Furthermore, Hamouma & Menezla' research (2020) depicts that students who possesses independent learning skills, can use digital sources showed significant improvements in their writing. These findings strengthen the claim that the ability to operate and apply digital learning materials enable students to enhance their skills in writing through practice and self-evaluation. Furthermore, the studies show that engaging in the digital platform also improves their confidence and joy towards writing tasks. Elahi

Shirvan et al. (2024) and Feng (2024) found that EFL student who have high digital literacy are more likely to enjoy themselves during the process of writing while at the same time developing greater self-efficacy which results in better results than other learners.

RESEARCH METHODOLOGY

The aims of this study are to examine the relationship between self-directed learning and technological proficiency, self-directed learning and writing performance, and technological proficiency and writing performance. This research employed a quantitative methodology. This study was conducted at French Literature Department of Universitas Negeri Semarang. The population of this study was 76 students at the 4th semester enrolling *Production Écrite Intermediaire* class (intermediate high level). Out of these, 33 students filled the online questionnaires provided. This research used convenience sampling, utilizes a cohort of potential participants who are convenient for this research (Vanderstoep & Johnston, 2009), involving in the researcher's French class.

The majority of participants were female (80%), with ages ranging from 19 to 21 years and an average age of 20 (± 0.721). Predominantly, the participants were female (91%), aged between 19 and 21 years, with an average age of 20 (± 0.721). On average, students had a GPA of 3.40 (± 0.32) (refer to Table 1). An independent samples t-test revealed no significant differences in gender ($t(33) = -0.235$, $p = 0.646$), age ($t(33) = -2.092$, $p = 0.903$), or GPA scores ($t(33) = -0.241$, $p = 0.194$), indicating overall homogeneity among the participants.

Table 1
Participants' Demographic Information

		Frequency	Percent
Gender	Female	30	91
	Male	3	8
Age	Range	19-21	
	Mean $\pm$ SD	19.61 $\pm$.712	
GPA	Range	2.27-3.96	
	Mean $\pm$ SD	3.3989 $\pm$.32011	

Student writing achievement was evaluated through their performance on the writing component, they included a mandatory writing test administered at the program's conclusion. Each student was needed to write an essay with 80-120 words on a given topic. The classification of writing errors in this study was adapted from Dulay, Burt, and Krashen's (1982) *Surface Strategy Taxonomy* and James's (1998) linguistic taxonomy. The errors were grouped into four major categories — grammatical, lexical, mechanical, and discourse-related errors — covering morpho-syntactic accuracy, lexical choice, orthographic conventions, and textual coherence. Following the writing assessment, participants completed two online questionnaires using a Likert scale questionnaire, graded from 1 to 5. One questionnaire was utilized to find out students' digital competency and another one was to know language learner autonomy among tertiary-level French learners.

The online questionnaire about digital literacy was adapted The European Digital Competence Framework for Citizens, commonly referred to as DigComp, Created by the JRC (Carretero et al., 2017). The DigComp Framework comprises five key dimensions: (1) Identification of competence areas integral to digital proficiency, (2.) Description of competencies and titles relevant to each area (3) Proficiency levels delineated for each competency, (4) Specification of knowledge, skills, and attitudes pertinent to each competency, (5.) the ability to use example. These components were used to compose 21 questions in Indonesia language. Before the question given to the the real respondents, it was tested to 30 repondents in order to know the realibility and validity. The Cronbach's alpha of this questionnaire was 0.818 (as shown in table 2) which means the instrument has strong internal reability and validity.

Table 2
Reliability Statistics of Digital Literacy

Cronbach's	
Alpha	N of Items
0.818	13

The autonomous questionnaire constitutes an inquiry into the realm of students' autonomous learning, meticulously designed with Holec's (1981) seminal theory on autonomous learning as a guiding framework, and adapted from the scholarly work of Lee et al. (2017). As elucidated by Holec (1981), autonomous learning encapsulates not only a fervent desire for knowledge acquisition but also the adeptness in orchestrating one's own educational journey. Consequently, this survey is delineated into two distinct dimensions: the intrinsic drive to acquire knowledge and the adeptness in self-regulation, with the primary objective of assessing the subjects' inclination towards learning and their adeptness in self-directed educational pursuits. Demonstrating its strength, the questionnaire exhibits a notable degree of internal consistency, highlighted by a Cronbach's alpha of 0.877 (as delineated in Table 3), thus attesting to its inherent reliability and validity.

Table 3
Reliability Statistics of Autonomous Learning

Cronbach's	
Alpha	N of Items
0.887	20

To investigate the connections between digital literacy, autonomous learning, and writing performance, this study utilized Pearson correlation. Product-moment correlation methods were used to analyze the data with SPSS software. The Rule of Cohen was utilized to interpret the levels of correlation among digital literacy, autonomous learning, and writing performance (Cohen, 1988)

Table 4
Terminological Descriptors for Correlation Coefficients (Cohen, 1988)

Value	Interpretation
0.90 - 1.00	Nearly, practically, or almost: perfect, distinct, infinite
0.70 - 0.90	Very large, very high, huge
0.50 - 0.70	Large, high, major
0.30 - 0.50	Moderate, medium
0.10 - 0.30	Small, low, minor
0.00 - 0.10	Trivial, very small, insubstantial, tiny, practically zero

RESULT AND DISCUSSION

Digital Literacy and Autonomous Learning

Table 5
Correlations between Digital Literacy and Autonomous Learning

Correlation Coefficient	Probabilitiy
0.606	0.000

Based on the correlation test results shown in the table, the correlation coefficient is 0.606 with the probability 0.000. As the probability is less than the significance level, the H_0 is rejected. According to Cohen (1988) and Sisco (2008), there is a significant positive correlation between digital literacy and autonomous learning. The higher students' digital literacy skill, the higher their level of autonomous learning. This suggests that by strengthening the digital literacy will develop their autonomy in learning.

This findings correspond to Yang & Kim' (2015) research that showed that students possessing high digital literacy skills impacts their ability to manage their learning in virtual educational frameworks. Particularly, critical literacy had significant affects on self-learning, cognitive control, metacognitive regulation, and behavior management. Zeng (2023) also confirms that those who have self-management skills with a great motivation to atively look for information online, their self-directed learning and digital literacy are strenthened. By contrast to what Hasyim's research finding (2021) showed that there is no correlation between autonomous learning and digital lieracy among students in General Education English Department. Similarly, Gokse (2022) found that digital literacy and self-regulated learning skills are not not always interconnected.

According to Chik (2017) digital literacy has the capacity enhance students learning, however they do not foster independent learning automatically. Briefly, this article highlights that independent learning requires more than digital literacy, it need also self-regulation and motivation in order to foster autonomous learning.

Digital Literacy and Writing Performance

Table 6

Correlations between Digital Literacy and Writing Performance

Correlation Coefficient	probability
0.363	0.038

Correlation test results from the table show a correlation coefficient of 0.363 between digital literacy and writing performance with a probability value of 0.038. Given that this probability is below the 5% alpha level, thus, H₀ (null hypothesis) is rejected. As a result, it can be assumed that there is an association between digital literacy and writing performance. A correlation coefficient of 0.363 indicates moderate positive relationship, which means that digital literacy increases writing performance and vice versa.

A number of studies have examined the connection between digital competence and writing performance. The results indicate a positive correlation between the level of students' technology skills and their success in writing. It is believed that students who can use the right tools to help them write are those who know how to use the internet well enough. Thus, students possessing sufficient skillsets in using educational technology designed specifically for writing will tend to have better achievement in written assignments than those who don't know how to use such tools effectively.

Furthermore, more recent other studies agree with these claims were conducted by Hamouma & Menezla (2020) highlighting a constructive correlation between students' digital aptitude and writing achievement. Also, findings outlined by Andina et al. (2020) and Janfaza (2014) revealed that the combination of learners' learning autonomy and technology leads to a noticeable better writing performance. The present study, in this case, confirms these previous findings.

Sisco (2008), however, found out that there are less significant correlations between technology usages and writing skills development in the secondary students' level. This rises further issues related other variables, which might be related to the maturity. The present study, thus, advises that the positive correlation between digital competencies and improved writing outcomes may not be generalizable across educational levels. Therefore, further research should survey different student populations, which covers secondary and higher educational levels.

Automous Learning and Writing Performance

The relationship between autonomous learning and writing performance was examined using Pearson correlation. The hypothesis testing criteria specify that if the probability is less than or equal to the significance level (alpha = 5%), the null hypothesis (H₀) is rejected, indicating a significant relationship between autonomous learning and writing performance. The results of this analysis are presented in the following table 7.

Table 7

Correlation between Autonomous Learning and Writing Performance

Correlation Coefficient	probability
0.289	0.103

Based on the table 7. the correlation coefficient of autonomous leaning and writing performance are 0.289 with probability value 0.103, this result indicates that there is weak correlation between students' autonomous leaning and writing performance. Thus, it implies that the higher level of students autonomous learning skills. The higher their writing performance.

This finding is in line with Andina et al. (2020) and My-Tham (2021) greater autonomy is crucial for better writing scores. This finding emphasizes the importance of promoting learner autonomy in writing instruction, as supported by (Sadegh Bagheri & Aeen, 2011; Togoshiho & Tanaka, n.d.). Therefore, fostering autonomous language learning is essential for enhancing teaching and learning quality. Another practical implication is that choosing suitable methods and strategies to foster an autonomous learning environment can be beneficial for effective teaching and learning.

Error Analysis of Students' Writing Performance

To deeper comprehend the weak correlation between autonomous learning and writing performance, the qualitative and quantitative analysis was conducted on students' written tasks. The objective of this analysis is to find out the types and frequency of linguistics and structural errors who affect the quality of students' writing and to elaborate how these errors correspond to learners' autonomy and digital literacy competence. The data taken from 22 students' writing tasks with average lenght 80-120 words. These texts were analysed by applying an error classification theory of Dulay, Burt, & Krashen (1982) and James (1998). Based on the analysis, it revealed that there four main categories of errors were identified i.e. grammatical, lexical, mechaniiical, and discourse errors.

Table 8

Types and Frequency of Writing Errors (N = 33)

Type of Error	Frequency	Percentage (%)	Common Examples
0.90 - 1.00	127	38.6%	<i>Elle aller à l'école hier → Elle est allée à l'école hier</i>
0.70 - 0.90	88	26.8%	<i>faire un erreur → commettre une erreur</i>
0.50 - 0.70	67	20.4%	<i>ete → été; je suis Francais → je suis français</i>
0.30 - 0.50	47	14.2%	Missing connectors, incoherent paragraph transitions
Total	329	100%	—

As shown in Table 8, grammatical errors were the most frequent (38.6%), followed by lexical errors (26.8%), mechanical errors (20.4%), and discourse-related errors (14.2%). Further analysis of learners' writing scores revealed that students with higher autonomy scores (≥ 70) made significantly fewer errors ($M = 7.3$ errors per essay) compared to those with lower autonomy scores (≤ 60) ($M = 14.6$ errors per essay). This suggests that autonomous learners engaged more actively in self-monitoring, revising, and utilizing digital resources such as grammar checkers and online dictionaries to refine their writing.

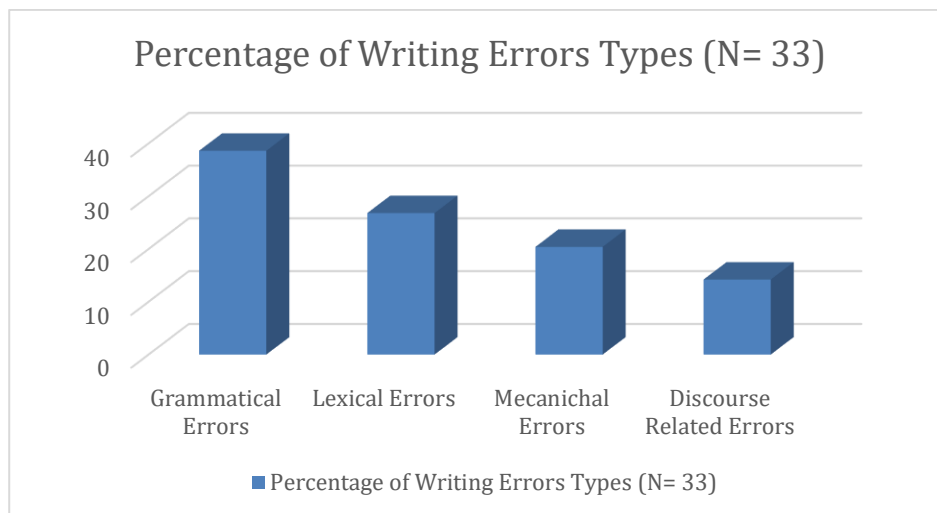


Figure 1. *Distribution of Writing Error Types among Students (N = 33).*

The figure 1 depicts the percentage of four major errors in students' writing. As we can see that grammatical errors were the most noticeable errors (38.6%), followed by lexical errors (26.8%), mechanical errors (20.4%), and discourse-related errors (14.2%). The predominance of grammatical and lexical errors implies that students still face challenges in applying French linguistic rules accurately, while lower rates of mechanical and discourse errors suggest developing awareness of textual structure and coherence.

In the grammatical errors part, students frequently misused tenses and agreement patterns, especially when narrating past events. Many replaced *passé composé* with *imparfait* or used infinitive verbs instead of conjugated forms. This indicates insufficient grammatical awareness and limited self-regulation strategies during independent writing. The second component is lexical errors, students often performed literal translations from Indonesian or English, leading to semantic inaccuracies and unnatural phrasing. Learners with strong digital literacy tended to consult online dictionaries and French corpora, reducing lexical misselections. The third component is mechanical errors, in this part, students frequently misspelled words and made a mistake in french punctuation, particularly the omission of diacritical marks (e.g., *ete* → *été*), inconsistent capitalization, and punctuation misuse. These reflect a lack of revision and proofreading, which are key components of autonomous writing. The last one is discourse-related errors. Some students struggled to compose ideas structurally and coherently, omitting cohesive devices (*cependant, en revanche, par conséquent*). This suggests underdeveloped metacognitive skills for planning and structuring written discourse.

Overall, the error analysis reinforces the quantitative findings, demonstrating that while autonomy correlates only weakly with writing performance, it still contributes to improved accuracy and coherence. Students with stronger self-directed learning habits and digital awareness exhibited fewer grammatical and lexical errors, confirming that digital literacy supports autonomous learning and fosters more accurate written production.

CONCLUSION

Based on the results and discussion above, this study shows that there are positive correlation between digital literacy, autonomous learning, and writing performance. Although, other researches shows different degrees of correlation between digital literacy and autonomous learning, and some findings also prove that there are no correlation. The inconsistencies highlight that digital literacy skill solely is not adequate to foster autonomous learning. The later skill needs more than digital proficiency; it also needs self regulation and motivation. Thus, there is a need for further comprehensive investigation to comprehend components involved in autonomous learning.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest associated with the authorship of this paper.

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