

Implementing an Integrated Learning Model (Blegur Model) to Enhance Students' Critical Academic Writing, Digital Literacy, and Autonomous Learning

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Article Info	Abstract
Article history: Received: March 9, 2026 Accepted: May 2, 2026 Published: May 5, 2026 Keywords: Autonomous learning Blegur learning model Critical academic writing Digital literacy Integrated learning model This article is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. © 2026 Vidya Karya	This study examines the improvements in students' critical academic writing skills, digital literacy, and autonomous learning through the implementation of an integrated learning model (Blegur model). This study adopted a mixed-methods explanatory sequential design. Quantitative data (pretest-posttest) from 32 students were collected using standardized instruments: the Fundamentals of Academic Writing Rubric (20 items), the Students' Digital Competence Scale (SDiCoS, 28 items), and the Autonomous Learning Scale (ALS, 12 items). The quantitative data were analyzed using paired-samples t-tests. The intervention was implemented over one semester through eight structured learning syntaxes (orientation, distribution, experimental, presentation, analysis, problem solving, competition, and award). Additional qualitative data were obtained through in-depth interviews, which were analyzed thematically to validate the findings. The quantitative results showed highly significant improvements in all three variables ($p < 0.001$). Critical writing skills improved across all indicators, followed by improvements in six digital literacy indicators and aspects of autonomous learning. Qualitative findings revealed five themes that support the quantitative results, reflecting shifts in students' writing, digital literacy, learning independence, critical thinking, and academic self-confidence. Therefore, both quantitative and qualitative analyses indicated that the integrated model improves students' critical academic writing, digital literacy, and autonomous learning. Four factors influenced the improvements: active engagements in the learning process, exposure to and use of academic technology, clear and directed learning structure, and collaborative practices. Thus, this integrated learning model has proven effective and is recommended for courses that emphasize critical thinking skills, digital literacy, and autonomous learning.
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INTRODUCTION

Academic writing is one way to train students' critical thinking. Unfortunately, various studies report students' problems in critical academic writing. They have difficulty developing an organizational structure for their writing (Maharani et al., 2023), making it difficult to formulate a thesis statement, develop ideas, formulate cause-and-effect relationships, and discuss contrasting ideas (Nenotek et al., 2022). They can actually overcome this gap in critical academic writing problems with various advances in information technology today. For example, using digital tools and online blogs to write and provide new ideas and perspectives that are clear, logical, and critical while simultaneously increasing their interest and completing course assignments (Avinç & Doğan, 2024; Amin et al., 2022; Reddy et al., 2023). Unfortunately, this does not work well because students are also insufficient with digital literacy (Rasimin et al., 2024). As a result, student learning activities and teachers' professional development are not optimal (Pegalajar Palomino & Rodríguez Torres, 2023; Purnama et al., 2021), which continuously prevents students' 21st-century skills from developing (Ndibalema, 2025).

The above problems of critical academic writing and digital literacy are exacerbated by the Independent Curriculum policy, which provides students with a “red carpet” for autonomy in learning. Students do not appreciate and reflect on this valuable opportunity to develop their potential anywhere, anytime, and with anyone. Instead, they tend to cheat when learning autonomously without supervision and consequences for violations (Jalilzadeh et al., 2024; Rütth et al., 2024). They become apathetic in formulating learning objectives, determining learning methods, and simultaneously assessing, evaluating, and improving their own work. This uncontrolled autonomy in learning actually leads students astray, especially when they do not understand the lecture content (Fagerholm et al., 2024; Masouleh & Jooneghani, 2012). It means that, within this autonomy, lecturer guidance is still needed (Lämsä et al., 2023; Rahmawan, 2020), including directing students to use various learning strategies and models to help them develop their autonomous learning (Masouleh & Jooneghani, 2012), practice critical academic writing, and improve digital literacy.

In the 21st century, competitiveness has become evident across various sectors. It means preparing students to become teachers with a legacy of critical thinking and academic writing skills, mastering digital literacy to facilitate knowledge accessibility, building collaborative networks to enhance competence, and fostering autonomy in learning to develop their potential. If these three issues are not immediately addressed through the design of learning experiences or integrated learning models, they will become uncompetitive individuals due to their weakness in analyzing, verifying, and inferring information objectively, logically, and in depth. They will become passive individuals who maximize advances in digital technology to access new information and knowledge. Moreover, more worryingly, as prospective teachers, they have the potential to become individuals who lack initiative, proactivity, and autonomy in developing sustainable competencies for professional work in the workplace and in their social and community lives.

This research was designed to address a series of fundamental questions, beginning with identifying students' current competency profiles in critical academic writing skills, digital literacy, and autonomous learning. After mapping these initial conditions, the investigation shifted to improving these three aspects through the implementation of an integrated learning model. Furthermore, this research aims to uncover various determinants that influence the effectiveness of developing students' writing skills, digital literacy, and autonomous learning within this learning ecosystem. To achieve these objectives, this study employed a mixed-methods approach to examine in-depth the development of all research variables while comprehensively exploring the underlying factors. By integrating

quantitative and qualitative data, this research is expected to provide a comprehensive picture of the effectiveness of the implemented learning model

Previous studies have generally treated critical academic writing, digital literacy, and autonomous learning as separate constructs. Some research has focused on enhancing critical thinking through digital literacy-based case studies or integrated academic English learning models that combine writing and critical thinking skills (Sari et al., 2024; Zamista & Azmi, 2023). Other studies have emphasized the development of digital literacy through specific learning models and technology acceptance approaches (Setiasih et al., 2021; Desmaryani et al., 2024). Meanwhile, autonomous learning has been promoted through inquiry-based, cooperative, and collaborative learning strategies (Feyzioğlu & Demirci, 2021). However, these studies tend to address each aspect independently rather than examining their integration in supporting students' academic writing development

This study offers a novel approach to testing improvements in these three research variables using an integrated learning model. This model relies on goal-setting theory, constructivist learning theory, and transformative learning theory (Blegur et al., 2024). Goal-setting theory encourages students to set specific, measurable learning goals, thereby guiding deliberate learning actions to improve learning performance (Alessandri et al., 2020; Blegur et al., 2021; E. A. Locke & Latham, 2002; Tosi et al., 1991). Constructivist theory provides opportunities for students to construct knowledge from their own experiences (Kieu Oanh & Hong Nhung, 2022). Transformative learning theory trains students to create their own interpretations by developing autonomous thinking, a characteristic of adult learning (Mezirow, 1997, 2009, 2018) through experiential learning within meaning schemes, learning new meaning schemes, and learning through meaning transformation (Kitchenham, 2008).

Previously, integrated learning models have successfully improved teaching skills, analytical thinking skills, academic integrity, and student transformational leadership (Blegur et al., 2024; Bakri & Riyanto., 2024). There are eight learning syntaxes, starting with orientation, distribution, experimentation, presentation, analysis, problem-solving, competitions, and awards. This model is not only designed to increase students' awareness of their learning objectives but also to train critical thinking and foster independent learning by maximizing digital literacy. Students learn critically during the orientation phase, where they can maximize critical thinking by using various digital literacies on online platforms for independent learning, such as reviewing course materials, learning models, and assessment indicators to inform their learning outcomes. Therefore, the present study aims to examine how these three elements can be integrated to support students' academic writing development. Specifically, this study investigates the interplay between digital literacy, critical thinking, and autonomous learning in enhancing students' academic writing performance.

METHODS

This study used a mixed-methods, explanatory sequential design. The researcher first conducted quantitative research, analyzed the results, and then used qualitative research to elaborate on them (Creswell & Creswell, 2018). The detailed procedures are quantitative data collection, quantitative data analysis, linking quantitative and qualitative data, qualitative data collection, qualitative data analysis, and integration of quantitative and qualitative research results (Ivankova et al., 2006).

A total of 32 fourth-semester students from the English Language Education Study Program at Artha Wacana Christian University, comprising 6 males and 26 females, participated in this study. The participants' ages ranged from 19 to 21. As this study involved the entire 2023–2024 academic year, a total sampling technique was used. This group was selected for their concurrent enrollment in the academic writing course, which is relevant to the research objectives. Prior to data collection, all participants were fully

informed about the purpose, procedures, and their rights as respondents, and they provided voluntary informed consent. To maintain ethical transparency and minimize potential power imbalances between researchers and participants, it was emphasized that participation was voluntary, would not affect academic grades, and that participants could withdraw at any time without consequences. Furthermore, the data collection and analysis were conducted anonymously to maintain participants' confidentiality.

Data collection on critical academic writing skills used 18 items from nine critical academic writing indicators: asking relevant questions, evaluating information sources, analyzing information and interpreting data, considering multiple perspectives, applying logic and reasoning, synthesizing information, reflecting on thoughts, communicating findings clearly, and finally, seeking feedback (Kurfiß, 1988). Furthermore, the researcher assessed the respondents' critical academic essays using 20 items from five indicators of the Fundamentals of the Academic Writing Rubric version 2 on a three-point scale (0-2): introduction, citation, academic writing, idea presentation, and mechanics (Razi, 2023).

Digital literacy data were collected using the Students' Digital Competence Scale (SDiCoS) instrument developed by Tzafilkou et al. (2022). The CFA analysis results demonstrated a factor loading value of >0.50 (0.526-0.805). Furthermore, the SDiCoS goodness-of-fit test results indicated adequate fit, with a χ^2/df of 2.02, a p-value of 0.000, and an RMSEA of 0.080. However, the comparative fit index (CFI) of 0.84 and TLI of 0.80 fall within the adequate fit category, making the model acceptable in the context of social research involving multidimensional constructs.

The SDiCoS instrument consists of 28 items grouped into six digital competency factors. The first factor, search, find, and access, consists of five items (1-5) with a composite reliability (ρ_c) of 0.852. The second factor, develop, apply, and modify, includes six items (6-11) with a ρ_c value of 0.867. The third factor, communicate, collaborate, and share, includes three items (12-14) with a ρ_c value of 0.862. The fourth factor, store, manage, and delete, consists of five items (15-19) with a ρ_c value of 0.857. The fifth factor, evaluate, includes six items (20-25) and shows the highest composite reliability, namely, 0.898. Finally, the sixth factor, protect, consists of three items (26-28) with a ρ_c value of 0.835. Overall, the composite reliability values for each factor indicate that SDiCoS has good internal consistency and is suitable for measuring students' digital literacy.

Furthermore, data on autonomous learning were collected using the Autonomous Learning Scale (ALS), with an alpha coefficient of 0.78 (Macaskill & Taylor, 2010). The twelve ATS items comprised two factors: seven items on learning independence ($\lambda = 0.49$ -0.79), numbered 1, 6, 7, 8, 10, 11, and 12. Five items on learning habits ($\lambda = 0.47$ -0.86), numbered 2, 3, 4, 5, and 9. Two items (item 2, representing the learning habits indicator, and item 10, representing the learning independence indicator) were worded negatively to prevent response bias. Respondents responded to the ALS on a five-point Likert scale, ranging from "strongly disagree" to "agree strongly."

After collecting pre-test data, the researchers then experimented (for one semester) with an integrated learning model in academic writing courses with eight learning strategies, ranging from reward-oriented (Blegur et al., 2024). After completing the experiment, the researcher conducted a post-test using the same research instrument as in the pre-test to assess the extent to which the integrated learning model influenced critical academic writing skills, digital literacy, and autonomous learning.

At this stage, a number of questions were addressed to the respondents, and the credibility of the answers was tested using respondent triangulation, namely verifying the answers among respondents to develop a thematic conclusion about students' experiences in improving critical academic writing skills, digital literacy, and autonomous learning through an integrated learning model. The discussion-starting questions were as follows. First, "In your experience, why does the integrated learning model affect your critical academic writing skills, digital literacy, and autonomous learning?" Second, "Give an

example of how you maximize your critical academic writing skills, digital literacy, and autonomous learning when the lecturer applies the integrated learning model." Third, "Rationalize the syntax of experimentation, presentation, analysis, and problem-solving to improve your critical academic writing skills, digital literacy, and autonomous learning in academic writing lectures?" Fourth, "What is your strategy for maximizing critical academic writing skills, digital literacy, and autonomous learning to succeed in the syntax competition?" and so on.

Data analysis was conducted using a paired-samples t-test using SPSS-29. The aim was to examine the differences between the pre-test and post-test results of critical academic writing skills, digital literacy, and autonomous learning after being given an integrated learning model experiment. A significance value <0.05 indicates a significant difference, and vice versa.

This stage is characterized by in-depth interview data that researchers have transcribed and analyzed thematically using the N-Vivo-14 application. The thematic analysis process is as follows: preparing and organizing data for analysis, transcribing data, familiarizing oneself with the data, recording data, coding data using initial/age/gender, moving from codes to categories, and moving from categories to themes (Lester et al., 2020).

Following up on the results of the paired-samples t-test, the researchers conducted a qualitative exploration through purposive sampling of seven high-achieving respondents to explore their learning experiences. The participation of these participants aimed to provide a practical overview of the integrated learning model's success in academic writing courses. The qualitative data obtained were used to explain in depth the model's mechanisms of influence and to map new themes related to the factors influencing the development of the research variables.

RESULTS AND DISCUSSION

Quantitative Analysis Result

Academic writing skill

The analysis results showed improvements in all indicators of critical academic writing skills (see Table 1). For the introduction indicator, the average score increased from 2.9 ± 1.0 in the pre-test to 5.3 ± 0.7 in the post-test. The citation indicator also increased from 3.2 ± 0.7 to 4.5 ± 0.8 . Meanwhile, academic writing skills increased from 2.3 ± 0.8 to 4.4 ± 1.5 . The idea presentation indicator increased significantly, from 5.0 ± 1.2 to 8.1 ± 1.3 . Finally, the mechanics indicator increased from 3.1 ± 1.9 to 4.9 ± 1.2 .

Table 1 Profile of students' critical academic writing skills

No	Indicator	Descriptive (M $\pm$ SD)		Wilcoxon test	
		Pre-test	Post-test	Z	Two sided p
1	Introduction	2.9 ± 1.0	5.3 ± 0.7	-4.907 ^a	<0.001
2	Citation	3.2 ± 0.7	4.5 ± 0.8	-4.468 ^a	<0.001
3	Academic writing	2.3 ± 0.8	4.4 ± 1.5	-4.777 ^a	<0.001
4	Idea presentation	5.0 ± 1.2	8.1 ± 1.3	-4.962 ^a	<0.001
5	Mechanic	3.1 ± 1.9	4.9 ± 1.2	-3.896 ^a	<0.001

a. Based on negative ranks.

The data did not meet the assumption of normality, so the Wilcoxon test was done, and it showed that all these improvements were statistically significant, with Z-values ranging from -4.468 to -4.962 and a p-value <0.001 for all indicators. These findings indicate that the learning provided had significant differences in students' critical academic writing skills across all measured aspects (see Table 1).

Digital literacy

The analysis results are presented in the form of average values and standard deviations at the pre-test and post-test stages. Six indicators were evaluated: 1) search, find, access, 2) develop, apply, modify, 3) communicate, collaborate, share, 4) store, manage, delete, 5) evaluate, and 6) protect (see Table 2).

Table 2 Student digital literacy profile

No	Indicator	Descriptive (M±SD)		Paired-samples t-test	
		Pre-test	Post-test	t	Two sided p
1	Search, find, access	17.8±3.7	20.4±2.5	-4.612	<0.001
2	Develop, apply, modify	14.3±4.3	23.4±2.4	-9.146	<0.001
3	Communicate, collaborate, share	7.1±2.7	11.9±1.5	-8.924	<0.001
4	Store, manage, delete	16.2±5.0	20.4±1.8	-5.491	<0.001
5	Evaluate	17.0±5.2	23.8±2.9	-6.723	<0.001
6	Protect	11.0±3.2	13.0±1.7	-4.432	<0.001

The results showed an improvement in students' digital literacy skills across all indicators. For the search, find, and access indicator, the average score increased from 17.8±3.7 in the pre-test to 20.4±2.5 in the post-test. Develop, apply, and modify skills also increased significantly, from 14.3±4.3 to 23.4±2.4. Communicate, collaborate, and share indicators increased from 7.1±2.7 to 11.9±1.5, while store, manage, and delete skills increased from 16.2±5.0 to 20.4±1.8. Improvements also occurred in the evaluate indicator, from 17.0±5.2 to 23.8±2.9, and the protect indicator, which increased from 11.0±3.2 to 13.0±1.7.

The results of the paired-samples t-test confirmed these findings, with all indicators showing statistically significant t-values ($t = -4.432$ to -9.146) and a p-value <0.001 . It indicates that the implemented learning intervention had a strong influence on improving students' digital literacy across all measured aspects.

Autonomous learning

The two indicators measured were learning independence and study habits. Data were presented as mean scores and standard deviations for the pre-test and post-test to demonstrate changes in student abilities more comprehensively (see Table 3).

Table 3 Students' autonomous learning profile

No	Indicator	Descriptive (M±SD)		Paired-samples t-test	
		Pre-test	Post-test	t	Two sided p
1	Autonomous learning	24.6±4.1	29.3±2.5	-8.841	<0.001
2	Study habit	13.5±1.7	19.4±2.5	-13.167	<0.001

The analysis results showed a significant increase in both indicators of autonomous learning. For the autonomous learning. The indicators: the average score increased from 24.6±4.1 in the pre-test to 29.3±2.5 in the post-test. It indicates that students were able to manage their learning process more independently after participating in the course. A greater increase was observed in the study habits indicator, with the average score rising from 13.5±1.7 to 19.4±2.5. This increase indicates that students are becoming more consistent in implementing study habits that support ongoing study management and effectiveness.

The paired-samples t-test results showed that both improvements were statistically significant, with t-values of -8.841 for learning independence and -13.167 for study habits, and a significance level of $p < 0.001$. These findings confirm that the applied learning strongly contributes to improving students' autonomous learning.

Paired-samples t-test analysis

A normality test was conducted to ensure that the data on the academic writing, digital literacy, and autonomous learning variables were normally distributed before determining the appropriate statistical test. The test used the Shapiro-Wilk test, with data considered normal if the significance value (sig.) was >0.05 (see Table 4).

The results of the normality test indicate that the data distribution for the academic writing variable does not meet the assumption of normality. Both the academic writing pre-test (sig. <0.001) and the academic writing post-test (sig. = 0.004) had p-values <0.05 , indicating that the data at both stages were not normally distributed.

Table 4 Normality test data

	Shapiro-Wilk		
	Statistic	df	Sig.
Academic writing pre-test	0.834	32	<0.001
Academic writing post-test	0.891	32	0.004
Digital literacy pre-test	0.978	32	0.750
Digital literacy post-test	0.943	32	0.092
Autonomous learning pre-test	0.972	32	0.557
Autonomous learning post-test	0.970	32	0.495

In contrast, the digital literacy data fell into the normally distributed category. The significance values for the digital literacy pre-test (0.750) and the digital literacy post-test (0.092), both greater than 0.05, indicate that the assumptions of normality are met. For the autonomous learning variable, both the pre-test (sig. = 0.557) and the autonomous learning post-test (sig. = 0.495) also showed significance values above 0.05. Thus, the data at both stages were normally distributed. Overall, the results provide a basis for selecting appropriate statistical tests: nonparametric tests for academic writing variables and parametric tests for digital literacy and autonomous learning variables.

Table 5 Paired-samples t-test

	Paired differences		t/Z	Two sided p
	Mean	SD		
Academic writing pre-test-academic writing post-test	-10.75000	3.62786	-4.943 ^a	<0.001
Digital literacy pre-test-digital literacy post-test	-29.65625	19.27661	-8.703	<0.001
Autonomous learning pre-test-autonomous learning post-test	-10.56250	4.36952	-13.647	<0.001

a. Based on negative ranks.

The analysis results showed that all variables improved significantly. For academic writing skills, there was a mean difference of -10.75 (SD = 3.63) with a t/Z value of -4.943 and a significance level of <0.001 , indicating an improvement in skills after the intervention. The digital literacy variable also showed significant improvement, with a mean difference of -29.66 (SD = 19.28), a t-value of -8.703, and $p <0.001$. Similarly, autonomous learning increased significantly, with a mean difference of -10.56 (SD = 4.37), a t value of -13.647, and $p <0.001$. Overall, these results confirm that the learning provided had a strong influence on improving these three skills.

Qualitative Data Result

A thematic analysis was conducted of interviews with seven students before and after the intervention. The shift from a passive to a proactive mindset was mapped into five main themes (see Table 6).

Table 6 Thematic analysis on students' interview

Theme 1. From random writing to systematic workflow			
Pattern before	Sentences/phrases	Pattern after	Sentences/phrases
Characterized by confusing, inconsistent, summarizing, and unstructured keywords. (indicates high cognitive load)	"I used to write naturally without any set steps." (PDN/20/F)	Clear, disciplined, research structure, step-by-step, and analysis	"...the steps were clear. We started by finding ideas, reading, discussing, and then writing." (PDN/20/F)
	"I tended to wait for the lecturer's instructions. Writing was just a matter of summarizing the textbook, not analyzing arguments." (GJF/20/F)		"...I really had to find data, analyze it, and write." (GJF/20/F)
	"Writing felt difficult because I didn't have a structure... my digital literacy was limited." (DNN/22/F)		"Because there was an assessment rubric and the steps were structured..." (DNN/22/F)
	"My writing process wasn't systematic. I often didn't know where to start." (YDS/19/F)		"...I was used to writing using a research structure." (YDS/19/F)
Theme 2. The evolution of digital literacy: From general search to academic validation			
Pattern before	Sentences/phrases	Pattern after	Sentences/phrases
Low access, minimal exploration, weak source evaluation, negligible validity, Google dependency	"Rarely access academic journal databases" (YDS/19/F)	Increased reference literacy, citation management, Verification of quality sources, academic validation	"Improve my knowledge, especially regarding references and Mendeley" (YDS/19/F)
	"No encouragement to evaluate valid sources" (GJF/20/F)		"Always check DOIs, journal publishers, and citation quality" (GJF/20/F)
	"Search for references based on what they find on Google" (PDN/20/F)		"Check article quality in Google Scholar and SINTA" (PDN/20/F)
	"Use blogs/websites; do not understand DOIs yet" (ED/19/F)		"Learn to find relevant sources" (ED/19/F)
Theme 3. Learning independence: From dependence to autonomy of inquiry			
Pattern before	Sentences/phrases	Pattern after	Sentences/phrases
Low initiative, weak problem-solving, one-way learning (from lecturers)	"I tend to wait for the lecturer's instructions..." (GJF/20/F)	Self-directed learning, academic autonomy, high self-regulation	"I'm used to self-study" (GJF/20/F)
	"I feel passive... if I have a problem, I immediately ask for an answer without" (ED/19/F)		"...I try before I ask" (ED/19/F)
	"We prefer to just listen to the material" (RWR/19/F)		"...I'm used to researching before I consult." (RWR/19/F)
Theme 4. Critical thinking development: From description to argument analysis			
Pattern before	Sentences/phrases	Pattern after	Sentences/phrases
Low analysis, weak synthesis, limited critical evaluation	"I used to write fluidly without analysis... I didn't know how to connect two different ideas." (PDN/20/F)	Improved critical thinking, evidence-based analysis, strong argumentation	"...this process taught me critical thinking... comparing two articles to strengthen my analysis." (PDN/20/F)
	"My writing was just summarizing textbooks,		"...I have to analyze the text itself... and develop

	not analyzing arguments.” (GJF/20/F) “I lacked the ability to critically compare two texts... my strategy was to read only one source.” (DNN/22/F) “I often got confused about distinguishing between fact and opinion in the articles I read.” (RWR/19/F)		an argument.” (GJF/20/F) “Because there are structured steps... now I really have to analyze and write based on data.” (DNN/22/F) “...I strengthen the analysis... and the analysis deepens the argument.” (RWR/19/F)
Theme 5. Validation through interaction: Building academic self-confidence			
Pattern before	Sentences/phrases	Pattern after	Sentences/phrases
Relevance not understood, low participation, low critical literacy, cognitive confusion, self-doubt, academic anxiety	“I do not see the connection between the discussion and my writing, so I tend to stay quiet in class.” (YDS/19/F) “I often confuse fact with opinion, so when I am asked questions in discussions, I cannot answer” (RWR/19/F) “I feel incapable of constructing a logical argument... I feel inferior in front of the class.” LMM/20/F	Metacognitive awareness, concept clarification, learning independence	“Presentations help me understand the weaknesses in my arguments.” “...presentations test my understanding.” “Now I feel like I really have to find the data... [and] my independent thinking skills have strengthened.”

Overall, both quantitative and qualitative findings consistently demonstrate that the integrated learning model significantly improves students' critical academic writing skills, digital literacy, and autonomous learning. These findings confirm that the model's implementation is effective in strengthening students' skills and independence in the academic learning process.

Students' critical writing skills have increased

The findings of this study answer the main question: whether the integrated learning model can significantly improve students' critical academic writing skills. Improvements in five key indicators: introduction, argumentation, citation, organization, and mechanics indicate that students not only write better technically but also more reflectively and analytically. Theoretically, these findings align with the process-based writing theory (Algharabali, 2023; Haddad, 2020; Setiawan & Wiedarti, 2020), which emphasizes that writing is a cyclical cognitive process involving planning, writing, and revising. The practical application of this cyclical process is reflected in the students' experiences, where they noted that “...the steps were clear. We started by finding ideas, reading, discussing, and then writing” (PDN/20/F). This sentiment is further echoed by the observation that “...the steps were structured...” (DNN/22/F). The orientation phase, which emphasizes understanding concepts, objectives, and assessment criteria, also supports the self-regulated learning theory (Anggraeni et al., 2024), as students become aware of learning objectives, quality standards, and improvement strategies. Furthermore, the use of rubrics and journal text analysis reinforces the cognitive apprenticeship framework (Raitskaya & Tikhonova, 2025), in which students learn through examples, guidance, and gradual practice. Thus, improved critical writing skills are not simply the result of mechanical practice but the internalization of critical thinking strategies developed through a structured, reflective learning process.

The entire syntax of this model, from orientation, experimentation, presentations, analysis, problem-solving, competitions, and awards, demonstrates that learning activities are collaborative, reflective, and oriented toward continuous improvement. Theoretically, this is consistent with social constructivism, which asserts that knowledge is built through social interaction and dialogue. The peer review process, group discussions, and presentations support the formation of a zone of proximal development, where students learn from more competent peers (De Vries & Williams, 2022). DNN/22/F stated that “*because there was an assessment rubric for peer and the steps were structured...*” The use of technology (Mendeley, Grammarly, and digital journals) also reinforces the concept of technology-enhanced learning (Panackal et al., 2023; Sudirman et al., 2024), which helps students manage information, improve accuracy, and strengthen arguments, like stated by PDN/20/F “*I start to check article quality in Google Scholar and SINTA*”. The reflection, problem-solving, and competition stages foster metacognitive awareness, as students evaluate the strengths and weaknesses of their own writing. Thus, this model not only improves writing outcomes but also fosters active, collaborative, and critical learning patterns that align with the demands of academic writing in higher education.

Students' digital literacy has improved through source evaluation and the use of academic technology

The integrated learning model significantly improves students' digital literacy, particularly in the develop-apply-modify, communicate-collaborate-share, and protect aspects. Low initial scores indicate that students are not yet accustomed to evaluating the credibility of digital sources and have not yet utilized technology strategically in academic learning. After the intervention, all indicators increased significantly ($p < 0.001$), indicating that students are not only more technically skilled but also more reflective and critical in their use of technology. This is reflected in student statements, such as “*I check the quality of articles on Google Scholar and SINTA*” (PDN/20/F), “*I always check the DOI, journal publisher, and citation quality.*” (GJF/20/F), and “*...improved especially in terms of references and Mendeley.*” (YDS/19/F). Theoretically, these findings align with the digital literacy framework, which emphasizes that digital literacy encompasses cognitive, technical, and ethical dimensions in the management of digital information (Liu et al., 2024). The practice of verifying sources through Google Scholar, SINTA, and DOI checking reflects a critical aspect of digital literacy, namely the ability to evaluate the reliability of information. Furthermore, the use of Mendeley and collaborative platforms aligns with the information literacy theory (ACRL framework), which positions the evaluation, use, and production of information as core competencies in the academic context (Brennan et al., 2020; Weiss et al., 2021). Thus, improving students' digital literacy is not merely about mastering tools, but also about transforming their mindset in accessing, evaluating, and utilizing digital information responsibly.

The series of activities in the orientation and experimentation stages demonstrates that digital literacy is developed through hands on practice integrated with the academic writing process. Students are not only introduced to technology but also accustomed to using it contextually, ethically, and reflectively. This approach aligns with experiential learning theory, which holds that knowledge is constructed through real-life experience, reflection, and reapplication (Park & Kim, 2025; Suri et al., 2025). The use of technology as a collaborative tool in peer review also reinforces the principle of social constructivism, as understanding is formed through interaction and negotiation of meaning (Henukh et al., 2025). Limiting the use of AI to language refinement demonstrates ethical digital practice, which aligns with the concept of responsible technology use in education. Furthermore, repeated source evaluation exercises strengthen metacognitive awareness (Lazou & Tsinakos, 2025), as students learn to monitor the quality of the information they use. Thus, this integrated learning model shapes digital literacy that is not only operational but also

critical, collaborative, and ethical, essential competencies for students in the digital academic ecosystem.

Student autonomous learning has increased in learning independence and learning habits

The quantitative analysis showed that students' autonomous learning increased significantly after participating in integrated learning. For the learning independence indicator, the average score increased from 24.6 ± 4.1 in the pre-test to 29.3 ± 2.5 in the post-test. Similarly, the study habits indicator showed a greater increase, from 13.5 ± 1.7 to 19.4 ± 2.5 . The results of the paired-samples t-test confirmed that the increase in both indicators was statistically significant ($p < 0.001$), indicating that students not only became more able to manage their learning process independently but also increasingly consistently developed study habits that support the effectiveness of their studies. Thus, the quantitative data show that integrated learning has a substantial influence on strengthening students' autonomous learning.

This improvement is even more evident when examining student activities during the experimentation phase, where they are repeatedly trained to manage their learning process independently. At this stage, students must independently search for scientific references, evaluate the quality of sources, develop arguments, and revise their writing several times without waiting for direct instruction. They also develop the habit of creating reading schedules, comparing journals, and independently conducting similarity checks to ensure the originality of their work. These activities require students to develop control over their learning process, manage their time, and make independent academic decisions (Dewi et al., 2023; Fojkar & Berčnik, 2023; K. Locke et al., 2024). This process fosters critical thinking and enhances their academic writing abilities, essential components of higher education today (Costello et al., 2022; Fojkar & Berčnik, 2023; Kavulya et al., 2023). DNN/22/F stated, *"I make a habit of reading short journals before writing"*. LMM/20/F also stated, *"I make my own reading schedule before writing."* Thus, intensive experimental and self-reflective learning practices have been shown to significantly shape students' autonomous learning, both in managing the learning process and in developing long-term learning habits.

Implementation of the integrated learning model improves critical writing, digital literacy, and autonomous learning

The integrated learning model proposed by Blegur et al., (2024) comprises eight distinct stages, with the orientation phase playing a crucial role in laying the groundwork for students' academic development. During the orientation phase, students' abilities improve when the lecturer introduces the learning objectives, the semester-long activity flow, the assessment criteria, and basic academic writing concepts. At this stage, critical writing skills begin to develop through an understanding of academic essay structure, thesis statement writing, argument development, and research question-building. This emphasis aligns with the findings of scholars who argue that foundational writing skills are integral to academic success, particularly in higher education (Almahasees et al., 2024; Beck et al., 2006). Meanwhile, digital literacy develops when students are introduced to trusted sources such as Google Scholar, SINTA, DOAJ, Scopus, and reference management applications such as Mendeley. The use of Turnitin is also introduced to instill academic integrity from the outset. Those are essential tools for academic research (Astuti et al., 2021; Quinde et al., 2024). Simultaneously, autonomous learning is fostered through an explanation of independent learning expectations, including the habit of seeking out and reading sources independently and students' active role in monitoring the progress of their writing. This behavior indicates that students are encouraged to take initiative in their learning process, including independent exploration of sources and progress monitoring of their writing

assignments (Fujimoto-Adamson et al., 2024; Quinde et al., 2024). The orientation phase, while informative, lays an important foundation for developing an independent, evidence-based academic mindset.

During the distribution and experimentation phase, improvements in all three skills became much more visible as students began to repeatedly practice the entire academic writing process. In the distribution phase, grouping served to develop argumentative and collaborative skills, particularly as students discussed topic selection, assessed the quality of literature, and formulated initial ideas. As stated by Veddayana et al. (2025), grouping students for discussions about topic selection and literature assessment significantly enhances their collaborative engagement. It strengthened critical writing as students learned to weigh the relevance of data and confirm arguments collectively. During the extended exploration and experimentation phase, students independently searched for literature, evaluated scholarly sources, wrote drafts, conducted peer reviews, and revised their writing without waiting for direct instruction. This phase of independent writing and peer reviews not only reinforces their critical thinking abilities but also encourages them to participate in the academic discourse community actively (McCloskey et al., 2024; Stojanovska-Ilievska, 2023). Interview data clearly illustrated these activities: *“I have to search for data, analyze, and write... it makes me more independent”* (LMM/20/F); *“I check the quality of articles and check DOIs before use”* (GJF/20/F). These activities significantly improved digital literacy through source verification and Mendeley usage and strengthened autonomous learning through time management, academic decision-making, and independent revision.

In the presentation, analysis, problem-solving, competition, and award phases, these three skills are deepened through reflective and evaluative activities. In the presentation phase, students explain their arguments to other groups, strengthening their reasoning and defending skills. The analysis and problem-solving phases require students to assess the weaknesses of their arguments, improve the quality of their references, and adjust the structure of their writing, activities that directly enhance critical writing. This reflective process necessitates improving the quality of their references and restructuring their writing (Antonio & Tuffley, 2015; Pilkington et al., 2025). Digital literacy skills are further developed when students must ensure that all references are reliable and searched through credible platforms, while autonomous learning is evident in their habit of completing revisions without direct instruction, as demonstrated in the quote: *“I always revise several times without being asked”* (DNN/22). Antonio and Tuffley (2015) stated that understanding how to evaluate and select reliable sources directly connects to the development of digital literacy skills, which have become ever more relevant in today's information-rich environment. In the competition and award phase, students produce small research reports that are then selected for publication as book chapters. This process strengthens ownership, academic responsibility, and intrinsic motivation. Thus, the entire learning syntax works synergistically to simultaneously and continuously improve critical writing, digital literacy, and autonomous learning.

Factors influencing the improvement of critical writing, digital literacy, and autonomous learning

Qualitative findings indicate at least four main factors influencing student skill improvement: (1) active engagement in the learning process, (2) exposure to and use of academic technology, (3) clear and directed learning structures, and (4) collaborative practices such as discussions and peer review. The first factor emerged through analytical activities, independent data searches, and argumentation required in each assignment. Students emphasized that change occurred when they were encouraged to be active, rather than passive; this is evident in the statement: *“I was forced to be active... I had to search for data, analyze, and write. My autonomous learning became stronger”* (LMM/20/F). The

second factor emerged when students became accustomed to using academic technologies such as Google Scholar, SINTA, DOI, and Mendeley to assess the credibility of sources, as mentioned by PDN/20/F: *“I check the quality of articles in Google Scholar and SINTA before using them.”* Serrano-Aguilera et al.'s (2021) study revealed that the value of peer review is a collaborative learning strategy that improves student learning through active engagement and mutual assessment of work. Similarly, Dowse et al. (2018) note that peer review activities allow students to reflect on and improve their work by incorporating input from peers, boosting critical thinking and self-assessment.

The third factor influencing improvement was a systematic learning structure, including the presence of rubrics, writing steps, and targeted feedback. Students stated that an organized structure helped them understand academic standards and identify areas for improvement: *“Because there are assessment rubrics and structured steps, it made me aware of what needs to be improved”* (DNN/22). Research shows that students' understanding of academic conventions improves through structured approaches to academic writing. Hussain (2019) notes that ESL students face significant stylistic and structural challenges, which can be reduced through organized writing frameworks. Similarly, Hussain (2019) and Teng (2021) argue that structured guidance helps students manage complex grammar and academic terminology. In line with this, Yao et al. (2024) found that models such as the H5P pathway support students' transition from informal to formal writing and strengthen their awareness of academic standards, leading to improved writing performance.

The fourth factor was collaborative interaction, particularly through discussion and peer review, which helped students assess the strengths and weaknesses of their own and their peers' writing. As YDS/19/F stated: *“The presentations helped me understand the weaknesses of my arguments, and the analysis strengthened my understanding.”* This collaboration accelerated the development of critical writing and reinforced independent learning habits. Studies have shown that collaborative peer feedback improves critical thinking and writing quality (Fareed et al., 2021; Guo et al., 2025; Wijaya et al., 2021; Zhang et al., 2020). Although low-quality feedback may have little influence (Damanik, 2022), systematic advice and self-assessment improve learning and writing development (Guo et al., 2025; Ono, 2022). These four factors worked synergistically, fostering simultaneous improvement in critical writing, digital literacy, and student autonomous learning.

CONCLUSION

This study found that the integrated learning approach improves students' critical academic writing skills, digital literacy, and autonomous learning. Both quantitative and qualitative studies show that students significantly increased their ability to formulate arguments, evaluate digital sources, manage references, and regulate their own learning. These findings underline the model's significance as a comprehensive method that brings together cognitive, technical, and metacognitive aspects of academic learning. Despite these promising findings, this study has a number of limitations. The sample size was limited to one study program and one institutional context, perhaps limiting the findings' generalizability. Furthermore, because the intervention was executed throughout a single semester, the model's long-term implications could not be investigated. Future research should include larger and more diverse sample sizes, longer intervention durations, and comparative designs to evaluate the concept across disciplines and educational contexts. Further research may look into how individual model components, such as digital tools or peer input, independently influence learning results.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS STATEMENT

Conceptualization, ZAT, CPMR, ZE, and JB; methodology, ZAT, ZE, and JB; software, ZAT, and JB; validation, ZAT; formal analysis, ZAT, and CPMR; investigation, ZAT, CPMR, and ZE; resources, ZAT, and CPMR; data curation, ZAT, and CPMR; writing—preparation of the original draft, ZAT, CPMR, and ZE; writing—reviewing and editing, ZAT, and JB; visualization, CPMR, and JB; supervision, ZAT, and JB; and project administration, ZAT, and CPMR. All authors have read and agreed to the published version of the manuscript.

AI DISCLOSURE STATEMENT

The authors used Grammarly during the preparation of this manuscript to assist with grammar checking, language refinement, spelling correction, and improvement of writing clarity. All ideas, analyses, interpretations, arguments, and conclusions presented in this work were developed solely by the authors. After using Grammarly, the authors carefully reviewed and revised the manuscript as necessary and assume full responsibility for the content of the publication.

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REFERENCES

- Alessandri, G., Borgogni, L., Latham, G. P., Cepale, G., Theodorou, A., & De Longis, E. (2020). Self-set goals improve academic performance through nonlinear effects on daily study performance. *Learning and Individual Differences*, 77, 101784. <https://doi.org/10.1016/j.lindif.2019.101784>
- Algharabali, N. (2023). Why write more when you can write less? EFL students' insights on prewriting. *Open Journal of Modern Linguistics*, 13(5), 790–803. <https://doi.org/10.4236/ojml.2023.135046>
- Almahasees, Z., Al Awabdeh, A., & Mahmoud, S. (2024). ChatGPT and higher education: A pathway to unprecedented progress. *Journal of Higher Education Theory and Practice*, 24(5), 70–81. <https://doi.org/10.33423/jhetp.v24i5.7004>
- Anggraeni, C. W., Mujiyanto, J., Rustipa, K., & Widhiyanto, W. (2024). *Effects of utilizing self-regulated learning-based instruction on EFL students' academic writing skills: A mixed-method investigation*. *Asian. J. Second. Foreign. Lang. Educ.*, 10, 15. <https://doi.org/10.21203/rs.3.rs-4651154/v1>
- Antonio, A. B., & Tuffley, D. (2015). Promoting information literacy in higher education through digital curation. *M/C Journal*, 18(4), 8. <https://doi.org/10.5204/mcj.987>
- Astuti, D., Kardiyem, K., Rachmadani, W., & Mudrikah, S. (2021). The effect of students' digital literacy skill to the quality of accounting learning in self-directed learning as moderating variables. *Proceedings of the 3rd International Conference on Economics, Business and Economic Education Science, ICE-BEES 2020, 22-23 July 2020, Semarang, Indonesia*. <https://doi.org/10.4108/eai.22-7-2020.2307888>
- Avinç, E., & Doğan, F. (2024). Digital literacy scale: Validity and reliability study with the rasch model. *Education and Information Technologies*, 29(17), 22895–22941. <https://doi.org/10.1007/s10639-024-12662-7>
- Bakri, D., & Riyanto. (2024). Application of social simulation learning model to improve students' speaking and writing skills (study on english subjects in class vii smp n 3

- bengkulu city in the 2023/2024 academic year). *Indonesian Journal of Pedagogy and Teacher Education*, 2(2), 60–70. <https://doi.org/10.58723/ijopate.v2i2.260>
- Beck, W., Dunne, K., Fisher, J., O’Sullivan, J., & Sheridan, A. (2006). A cappella and diva: A collaborative process for individual academic writing. *M/C Journal*, 9(2), 7. <https://doi.org/10.5204/mcj.2610>
- Blegur, J., Haq, A. H. B., & Barida, M. (2021). Goal-setting strategies of prospective physical education teachers to maintain academic performance. *AL-ISHLAH: Jurnal Pendidikan*, 13(1), 473–484. <https://doi.org/10.35445/alishlah.v13i1.539>
- Blegur, J., Ma’mun, A., Berliana, Mahendra, A., Alif, M. N., Juliantine, T., & Lumba, A. J. F. (2024). Integrated learning models for micro-teaching course. *Emerging Science Journal*, 8(6), 2480–2500. <https://doi.org/10.28991/ESJ-2024-08-06-020>
- Blegur, J., Ma’mun, A., Berliana, B., Mahendra, A., Bakhri, R. S., & Calunsag, B. D. (2024). Enhancing teaching competence of prospective physical education teachers with integrated learning model. *Jurnal Cakrawala Pendidikan*, 43(3), 586–606. <https://doi.org/10.21831/cp.v43i3.57858>
- Blegur, J., Ma’mun, A., Berliana, & Mahendra, A. (2024). *Inovasi model pembelajaran terintegrasi: Upaya peningkatan keterampilan mahasiswa*. Literasi Nusantara. www.penerbitlitnus.co.id
- Brennan, E. A., Ogawa, R. S., Thormodson, K., & Von Isenburg, M. (2020). Introducing a health information literacy competencies map: Connecting the association of American medical colleges core entrustable professional activities and accreditation council for graduate medical education common program requirements to the association of college & research libraries framework. *Journal of the Medical Library Association*, 108(3), 420–427. <https://doi.org/10.5195/jmla.2020.645>
- Chowdhury, T. A. (2021). Fostering learner autonomy through cooperative and collaborative learning. *Shanlax International Journal of Education*, 10(1), 89–95. <https://doi.org/10.34293/education.v10i1.4347>
- Costello, E., Soverino, T., & Bolger, R. (2022). Mapping the MOOC research landscape: insights from empirical studies. *International Journal of Emerging Technologies in Learning (IJET)*, 17(14), 4–19. <https://doi.org/10.3991/ijet.v17i14.28721>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, mixed methods approaches* (4th ed.). SAGE.
- Damanik, J. Y. (2022). Language learning strategies used by Indonesian learners in IELTS. *Studies in English Language and Education*, 9(1), 62–77. <https://doi.org/10.24815/siele.v9i1.21448>
- De Vries, D., & Williams, B. (2022). A qualitative study of the process undergraduate health professions students utilize while conducting a scoping review. *Internet Journal of Allied Health Sciences and Practice*, 2(3), 1–9. <https://doi.org/10.46743/1540-580X/2022.2141>
- Desmaryani, S., Soleh, A., Irmanelly, & Wiarta, I. (2024). Integration of technology acceptance models and government support to improve digital literacy. *Heliyon*, 10(14), e34086. <https://doi.org/10.1016/j.heliyon.2024.e34086>
- Dewi, G. P. R., Santosa, M. H., Dewi, N. L. P. E. S., & Nitiasih, P. K. (2023). Assessing students’ writing skills in virtual classroom: strategies and challenges in EFL context. *Journal on English as a Foreign Language*, 13(1), 147–170. <https://doi.org/10.23971/jefl.v13i1.5288>
- Dowse, R., Melvold, J., & McGrath, K. (2018). Students guiding students: Integrating student peer review into a large first year science subject. A practice report. *Student Success*, 9(3), 79–86. <https://doi.org/10.5204/ssj.v9i3.471>
- Fagerholm, N., Lotsari, E., Nylén, T., Käyhkö, N., Nikander, J., Arki, V., & Kalliola, R. (2024). Self-assessment in student’s learning and developing teaching in geoinformatics

- case of Geoporti self-assessment tool. *Journal of Geography in Higher Education*, 48(3), 414–444. <https://doi.org/10.1080/03098265.2023.2251021>
- Fareed, M. U. B. J. R. A. Y. Z., Jamal, U. B., & Zai, R. A. Y. (2021). Peer feedback on writing skills: perceptions of Pakistani ESL postgraduate students. *Pakistan Journal of Educational Research*, 4(1), 399–415. <https://doi.org/10.52337/pjer.v4i1.169>
- Fojkar, M. D., & Berčnik, S. (2023). Academic writing in teaching research integrity. *Center for Educational Policy Studies Journal*, 13(3), 129–154. <https://doi.org/10.26529/cepsj.1602>
- Fujimoto-Adamson, N., Adamson, J. L., & Aida Niendorf, M. (2024). Exploring the supervisors' writing experiences and their effects on undergraduate thesis supervisory practices: A comparison of Japanese and Swedish contexts. *Research in Comparative and International Education*, 19(1), 23–45. <https://doi.org/10.1177/17454999241226773>
- Guo, K., Zhang, E. Di, Li, D., & Yu, S. (2025). Using AI-supported peer review to enhance feedback literacy: An investigation of students' revision of feedback on peers' essays. *British Journal of Educational Technology*, 56(4), 1612–1639. <https://doi.org/10.1111/bjet.13540>
- Haddad, C. (2020). Beyond the product: The effect of strategy-based instruction on EFL writing quality and process. *International Journal of Multilingualism and Languages for Specific Purposes*, 2(1), 69–90. <https://doi.org/10.52919/ijmlsp.v2i01.113>
- Henukh, A., Irvani, A. I., Setiawan, A., Seme, E. M., & Raja, N. R. L. (2025). AI and transformative learning in higher education: A systematic literature review and bibliometric insights. *Journal of Teaching and Learning*, 19(4), 233–261. <https://doi.org/10.22329/jtl.v19i4.10096>
- Hina Amin, Muhammad Abid Malik, & Bulent Akkaya. (2022). Development and validation of digital literacy scale (DLS) and its implication for higher education. *International Journal of Distance Education and E-Learning*, 7(1), 24–43. <https://doi.org/10.36261/ijdeel.v7i1.2224>
- Hussain, S. S. (2019). Strategies for teaching academic writing to Saudi L2 learners. *English Language Teaching*, 12(12), 1. <https://doi.org/10.5539/elt.v12n12p1>
- Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, 18(1), 3–20. <https://doi.org/10.1177/1525822X05282260>
- Jalilzadeh, K., Rashtchi, M., & Mirzapour, F. (2024). Cheating in online assessment: a qualitative study on reasons and coping strategies focusing on EFL teachers' perceptions. *Language Testing in Asia*, 14(1), 29. <https://doi.org/10.1186/s40468-024-00304-1>
- Kavulya, J. M., Kiilu, V. B., & Kyengo, B. N. (2023). The quest for quality in university education in the post-COVID-19 Era. *KLISC Journal of Information Science & Knowledge Management*, 1(1), 1–9. <https://doi.org/10.61735/q6r4kp50>
- Kieu Oanh, P. T., & Hong Nhung, N. T. (2022). Constructivism learning theory: A paradigm for teaching and learning English in secondary education in Vietnam. *International Journal of Scientific and Research Publications*, 12(12), 93–98. <https://doi.org/10.29322/IJSRP.12.12.2022.p13211>
- Kitchenham, A. (2008). The evolution of John Mezirow's transformative learning theory. *Journal of Transformative Education*, 6(2), 104–123. <https://doi.org/10.1177/1541344608322678>
- Kurfiss, J. G. (1988). *Critical thinking: Theory, research, practice, and possibilities*. ASHE-ERIC higher education report no. 2. Association for the Study of Higher Education. <https://files.eric.ed.gov/fulltext/ED304041.pdf>
- Lämsä, J., Virtanen, A., Tynjälä, P., Maunuksela, J., & Koskinen, P. (2023). Exploring students' perceptions of self-assessment in the context of problem solving in STEM.

- LUMAT: International Journal on Math, Science and Technology Education*, 11(2), 35–59. <https://doi.org/10.31129/LUMAT.11.2.2028>
- Lazou, C., & Tsinakos, A. (2025). A framework for participatory creation of digital futures: A longitudinal study on enhancing media literacy and inclusion in K-12 through virtual reality. *Information*, 16(6), 482. <https://doi.org/10.3390/info16060482>
- Lester, J. N., Cho, Y., & Lochmiller, C. R. (2020). Learning to do qualitative data analysis: A starting point. *Human Resource Development Review*, 19(1), 94–106. <https://doi.org/10.1177/1534484320903890>
- Liu, G., Pajewski, A., & McMullin, R. (2024). Evaluating online sources: Introducing a 4-step strategy. *College & Research Libraries News*, 85(3), 71–74. <https://doi.org/10.5860/crln.85.3.119>
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705–717. <https://doi.org/10.1037/0003-066X.57.9.705>
- Locke, K., Ellis, K., & Wolf, K. (2024). Auditory learner: An examination of changing learning styles and expectations in higher education. *M/C Journal*, 27(2), 9. <https://doi.org/10.5204/mcj.3029>
- Macaskill, A., & Taylor, E. (2010). The development of a brief measure of learner autonomy in university students. *Studies in Higher Education*, 35(3), 351–359. <https://doi.org/10.1080/03075070903502703>
- Maharani, R., Hakiki, S. S., & Safitri, S. (2023). Students' problems in writing academic article: A case study in academic writing class. *English Education: Jurnal Tadris Bahasa Inggris*, 16(2), 219–237. <https://doi.org/10.24042/ee-jtbi.v16i2.17434>
- Masouleh, N. S., & Jooneghani, R. B. (2012). Autonomous learning: A teacher-less learning! *Procedia - Social and Behavioral Sciences*, 55, 835–842. <https://doi.org/10.1016/j.sbspro.2012.09.570>
- McCloskey, R., Morris, P., Keeping-Burke, L., Goudreau, A., McGill, A., Knight, H., Buckley, S., Mazerolle, D., & Jones, C. (2024). Pedagogical and teaching strategies used to teach writing to pre-licensure students enrolled in health professional programs: A scoping review protocol. *JBIE Evidence Synthesis*, 22(11), 2358–2366. <https://doi.org/10.11124/JBIES-23-00327>
- Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education*, 1997(74), 5–12. <https://doi.org/10.1002/ace.7401>
- Mezirow, J. (2009). An overview on transformative learning. In K. Illeris (Ed.), *Contemporary theories of learning: Learning theorists – in their own words* (pp. 90–105). Routledge Taylor and Francis Group.
- Mezirow, J. (2018). Contemporary theories of learning. In K. Illeris (Ed.), *Contemporary theories of learning: Learning theorists ... in their own words* (Second, pp. 90–105). Routledge. <https://doi.org/10.4324/9781315147277>
- Ndibalema, P. (2025). Digital literacy gaps in promoting 21st century skills among students in higher education institutions in Sub-Saharan Africa: a systematic review. *Cogent Education*, 12(1), 2452085. <https://doi.org/10.1080/2331186X.2025.2452085>
- Nenotek, S. A., Tlonaen, Z. A., & Manubulu, H. A. (2022). Exploring university students' difficulties in writing English academic essay. *AL-ISHLAH: Jurnal Pendidikan*, 14(1), 909–920. <https://doi.org/10.35445/alishlah.v14i1.1352>
- Ono, M. (2022). Approach to Writing from Readers' perspectives: Incorporating self-evaluation, peer feedback, and self-reflection into academic writing. In L. Waller & S. Waller (Eds.), *Higher Education - New Approaches to Accreditation, Digitalization, and Globalization in the Age of Covid*. IntechOpen. <https://doi.org/10.5772/intechopen.100308>
- Panackal, N., Sharma, A., & Rautela, S. (2023). A bibliometric analysis of the intellectual landscape of mobile technology and higher education research. *International Journal of*

- Interactive Mobile Technologies (IJIM)*, 17(22), 4–25. <https://doi.org/10.3991/ijim.v17i22.43031>
- Park, J.-H., & Kim, S.-J. (2025). Entrepreneurial competencies in the era of digital transformation: A systematic literature review. *Digital*, 5(4), 46. <https://doi.org/10.3390/digital5040046>
- Pegalajar Palomino, M. del C., & Rodríguez Torres, Á. F. (2023). Digital literacy in university students of education degrees in Ecuador. *Frontiers in Education*, 8, 1299059. <https://doi.org/10.3389/feduc.2023.1299059>
- Pilkington, B., Caplan, A., & Parsi, K. (2025). In an age of anti-intellectualism, what is the value of expertise? *Voices in Bioethics*, 11, 53–62. <https://doi.org/10.52214/vib.v11i.13851>
- Purnama, S., Ulfah, M., Machali, I., Wibowo, A., & Narmaditya, B. S. (2021). Does digital literacy influence students' online risk? Evidence from Covid-19. *Heliyon*, 7(6), e07406. <https://doi.org/10.1016/j.heliyon.2021.e07406>
- Quinde, G. A. L., Muñoz, M. Y. T., Suárez, J. M. R., Villarreal, R. E. P., Vélez, W. A. Z., & Láinez, A. A. D. P. (2024). Perception of university students on the use of artificial intelligence (AI) tools for the development of autonomous learning. *Revista de Gestão Social e Ambiental*, 18(2), e06170. <https://doi.org/10.24857/rgsa.v18n2-136>
- Rahmawan, A. D. (2020). Students' obstacles on autonomous English learning. *ELTICS: Journal of English Language Teaching and English Linguistics*, 5(1), 1–9. <https://doi.org/10.31316/eltics.v5i1.527>
- Raitskaya, L., & Tikhonova, E. (2025). Enhancing critical thinking skills in ChatGPT-human interaction: A scoping review. *Journal of Language and Education*, 11(2), 5–19. <https://doi.org/10.17323/jle.2025.27387>
- Rasimin, Semma, A. B., Zakiyuddin, Ali, M., & Helmy, M. I. (2024). Multi-dimensional challenges in the Indonesian social science information technology-based learning: A systematic literature review. *Heliyon*, 10(7), e28706. <https://doi.org/10.1016/j.heliyon.2024.e28706>
- Razi, S. (2023). Emergency remote teaching adaptation of the anonymous multi-mediated writing model. *System*, 113, 102981. <https://doi.org/10.1016/j.system.2023.102981>
- Reddy, P., Chaudhary, K., & Hussein, S. (2023). A digital literacy model to narrow the digital literacy skills gap. *Heliyon*, 9(4), e14878. <https://doi.org/10.1016/j.heliyon.2023.e14878>
- Rüth, M., Jansen, M., & Kaspar, K. (2024). Cheating behaviour in online exams: On the role of needs, conceptions and reasons of university students. *Journal of Computer Assisted Learning*, 40(5), 1987–2008. <https://doi.org/10.1111/jcal.12994>
- Sari, F. A., Trisnawati, F. F., Supentri, S., & Isjoni, M. Y. R. (2024). Digital literacy-based case method lecture model for strengthening student critical thinking. *AL-ISHLAH: Jurnal Pendidikan*, 16(1), 336–344. <https://doi.org/10.35445/alishlah.v16i1.4576>
- Serrano-Aguilera, J. J., Tocino, A., Fortes, S., Martín, C., Mercadé-Melé, P., Moreno-Sáez, R., Muñoz, A., Palomo-Hierro, S., & Torres, A. (2021). Using peer review for student performance enhancement: Experiences in a multidisciplinary higher education setting. *Education Sciences*, 11(2), 71. <https://doi.org/10.3390/educsci11020071>
- Setiasih, O., Setiawardani, W., Nandi, Rusman, & Iriawan, S. B. (2021). The implementation of the Amora learning model to improve students' digital literacy skill of Indonesia university of education. *Journal of Physics: Conference Series*, 1764(1), 012093. <https://doi.org/10.1088/1742-6596/1764/1/012093>
- Setiawan, M. R., & Wiedarti, P. (2020). The effectiveness of quizlet application towards students' motivation in learning vocabulary. *Studies in English Language and Education*, 7(1), 83–95. <https://doi.org/10.24815/siele.v7i1.15359>

- Stojanovska-Ilievska, N. (2023). On the perceived usefulness and effectiveness of Eduflow as a supplementary tool for online writing instruction. *Journal of Academic Writing*, 13(1), 11–21. <https://doi.org/10.18552/joaw.v13i1.890>
- Sudirman, A., Gemilang, A. V., Kristanto, T. M. A., Robiasih, Rr. H., Hikmah, I., Nugroho, A. D., Karjono, J. C. S., Lestari, T., Widyarini, T. L., Prastanti, A. D., Susanto, Moh. R., & Rais, B. (2024). Reinforcing reflective practice through reflective writing in higher education: A systematic review. *International Journal of Learning, Teaching and Educational Research*, 23(5), 454–474. <https://doi.org/10.26803/ijlter.23.5.24>
- Suri, N. A., Festiyed, Azhar, M., Yerimadesi, Ahda, Y., & Heffi Alberida. (2025). Measuring what matters: a systematic review and VOSviewer-based bibliometric approach to digital literacy assessment instruments, competency dimensions and challenges in education. *Research in Learning Technology*, 33. <https://doi.org/10.25304/rlt.v33.3413>
- Teng, M. F. (2021). The effectiveness of incorporating metacognitive prompts in collaborative writing on academic English writing skills. *Applied Cognitive Psychology*, 35(3), 659–673. <https://doi.org/10.1002/acp.3789>
- Tosi, H. L., Locke, E. A., & Latham, G. P. (1991). A theory of goal setting and task performance. *The Academy of Management Review*, 16(2), 480–483. <https://doi.org/10.2307/258875>
- Tzafilkou, K., Perifanou, M., & Economides, A. A. (2022). Development and validation of students' digital competence scale (SDiCoS). *International Journal of Educational Technology in Higher Education*, 19(1), 30. <https://doi.org/10.1186/s41239-022-00330-0>
- Veddayana, C., Suyitno, I., Widyartono, D., & Aldresti, F. (2025). Systematic review: How technology supports collaborative writing learning in higher education. *Electronic Journal of E-Learning*, 23(3), 64–78. <https://doi.org/10.34190/ejel.23.3.3974>
- Weiss, A. P., Alwan, A., Garcia, E. P., & Kirakosian, A. T. (2021). Toward a comprehensive model of fake news: A new approach to examine the creation and sharing of false information. *Societies*, 11(3), 82. <https://doi.org/10.3390/soc11030082>
- Wijaya, T. T., Rizki, L. M., Yunita, W., Salamah, U., Pereira, J., Zhang, C., Li, X., & Purnama, A. (2021). Technology Integration to teaching mathematics in higher education during coronavirus pandemic using SAMR model. *Journal of Physics: Conference Series*, 2123(1), 012043. <https://doi.org/10.1088/1742-6596/2123/1/012043>
- Yao, X., Shao, Y., & Luo, R. (2024). The effectiveness of using an H5P pathway to enhance college students' academic style in writing. *European Journal of Teaching and Education*, 6(1), 35–56. <https://doi.org/10.33422/ejte.v6i1.1221>
- Yıldız Feyzioğlu, E., & Demirci, N. (2021). The effects of inquiry-based learning on students learner autonomy and conceptions of learning. *Turkish Journal of Science Education*, 18(3), 401–420. <https://doi.org/10.36681/tused.2021.81>
- Yu, S., & Zhang, L. (2024). A probe into the integrated learning model of academic English 'writing + critical thinking' in Sino-foreign joint education. *World Journal of Education and Humanities*, 6(1), 132–142. <https://doi.org/10.22158/wjeh.v6n1p132>
- Zamista, A. A., & Azmi, K. (2023). Digital learning: How the process enhances students' digital literacy. *Jurnal Penelitian Pendidikan IPA*, 9(9), 7189–7195. <https://doi.org/10.29303/jppipa.v9i9.5401>
- Zhang, J., Kuusisto, E., Nokelainen, P., & Tirri, K. (2020). Peer feedback reflects the mindset and academic motivation of learners. *Frontiers in Psychology*, 11, 01701. <https://doi.org/10.3389/fpsyg.2020.01701>

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