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TRADITIONAL WRITING AND E-WRITING USING GEN-AI TO EMPOWER STUDENTS' CRITICAL THINKING IN ARGUMENTATIVE TEXT: A CASE STUDY IN INDONESIAN EFL HIGHER EDUCATION

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Abstract: The high increase in utilizing Generative AI (Artificial Intelligence) has become a concern as it may potentially impede the development of students' cognitive skills, particularly critical thinking skill. This may occur if students have less frequent of traditional writing process to train students' memory and retention. Model of academic writing activity preceded by traditional writing, followed by e-writing with the assistance of Generative AI, such as ChatGPT, Gemini, Meta AI, etc., is worth conducting. With the utilization of case study, the present study explores the procedure of and the students' experiences in traditional writing and e-writing using Gen-AI assistance to empower students' critical thinking in argumentative text. The 24 third year students enrolling Academic Writing Class in English Education Program were selected purposively. Nine students' argumentative documents text, and semi-structured interview administered to nine students were utilized to obtain the primary data. The findings showed that the model of writing argumentative text traditionally followed by e-writing argumentative text using Gen-AI resulted in a powerful students' critical thinking in writing argumentative. Generative AI assisted students in incorporating critical thinking elements in argumentative text, particularly in formulating thesis statements and presenting clear facts and logical arguments. Whereas, students experienced the model of writing positively, i.e., students were aware of 1) traditional writing that could maintain brain retention, 2) e-writing leading to innovative work, 3) Gen-AI use in polishing the mechanics aspects of students' written work, 4) generic structure of argumentative text, and 5) basic notion of critical thinking. Future research is recommended to broaden the present research and to investigate a more comprehensive research result on related topic by using specific interview questions category of feeling (emotion focus), contrast (comparison) and construct forming (building the concept/ meaning) with the type of both structured and semi structured interview.
Keywords: *argumentative text; artificial intelligence; critical thinking; e-writing; traditional writing*

INTRODUCTION

Writing, as one of language skill element that should be skilled at by students, requires comprehensive thought (Galbraith & Baaijen, 2018; Naveed et al., 2025). Those who have been equipped by comprehensive language element and linguistics aspects are not doubtful to have a good sentence arrangement, a structured, organized, and clearly way (Gerald & Joseph, 2024). The good sentence also must be delivered in analytically way by using grammar, vocabulary, spelling, and sentence structure, as stated in Anderson et al. (2023), Fonkamo & Zeru (2022). These previous studies might imply that the cognitive aspect is emphasized; thus, to be an effective writer, a comprehensive knowledge and mastering language element and linguistics aspects are critical. Therefore, Nawi et al. (2025) suggest that to produce structured and certain academic text, undergo comprehensive routine is required.

The most ultimate aspect in writing is claimed by Axrorova (2025) which emphasized the careful preparation/arrangement, systematic, and proofreading. These emphasis indicates necessity

of the writer's capacity in delivering her/ his claim, evaluating evidence, reasoning, and justify her/ his position. This is proven by the current study conducted by Zheng et al. (2026) in that students in the experimental group had significant improvements with notable gains in dispositions such as open-mindedness, analytical thinking, and self-confidence in writing argumentative text. Thus, writing, as one of productive skill is known as a complex skill involving analytical and systematic structure of thought.

Practically, Nastal and Messer (2025) declare that students needs an extra effort when it comes to writing. The rationale of that issue occurred due to the fact that 1) there is unsynchronization between thought speed and hand-written speed (Limpo & Graham, 2020); 2) it is challenging to structure word by word (Alsalami, 2022; Daud & Firmansyah, 2024; Yassin, 2024) and to fulfil a well and clear statement or sentence; and 3) there is limitation in pouring out the ideas (Saprina et al., 2021). Therefore, the existence of critical thinking is highly required in writing skill (Teng & Yue, 2023; Khairuddin et al., 2024; Leibovitch et al., 2024).

Critical thinking, as one of the 21st century competences, is someone's ability in elaborating an idea in a deeper way (Pelenkahu et al., 2024) and spreading to compatible in finding the cause and found out the solutions (Wu, 2021). Moreover, Silva et al. (2025) declare that critical thinking is a multifaceted individual's capability that implicates the observation, controlling, evaluate the effectiveness of one's own thinking strategies in heterogeneous situations, as well as including the element of reasonable (Prayogi et al., 2024) and methodically perspective. Furthermore, Lestari et al. (2025) understand critical thinking as an ability in considering the information, predictable questions (Novia et al., 2024), and also unravel an issue in a logic, innovative and creative way (Walter, 2024). By referring to Blooms Taxonomy, critical thinking consist of six point's cognitive features; remembering, understanding, applying, analyzing, evaluating and creating (Krathwohl, 2002; Sudirtha et al., 2022). Based on the elaboration above, the studies highlight that critical thinking is a complex skill that encompass in-depth thought which spread the key-points of identifying, consideration of the matter along with clarity, accuracy and precision decision.

To embody the essential of critical thinking, argumentative text is the best alternative to facilitate and trigger critical thinking in writing (Mahdavivand Fard, 2025; Reichenbach, 2001). Accordingly, it is stated that the persuasive language exemplified in argumentative text involves thesis statement, argument, opinion, facts/ data, evidence and reason to demonstrate critical thinking in writing (Ibid). Moreover, study conducted by Beniche (2023) report on the a positive correlation between critical thinking and argumentative text which is very significant. As one of genre texts, argumentative text is a type of text comprising someone's pure logical thought (Kusumo et al., 2025), empowered by an actual and valid data (Akib et al., 2024) to make the idea more reliable and acceptable by society or reader (AlSalem, 2025). Additionally, study conducted by Nurjamin et al. (2025) define argumentative text parallel with processing supporting facts, forming perception, and even articulating persuasive language, potentially reform the challenges process of fabricating well-reason essays in English. Uluocak and İpek (2022) reveal that the most pivotal characteristic of argumentation lean on an assured standpoint. Therefore, it could be concluded that writing argumentative is an activity and ability in encompassing a systematic and logical collection of thoughts through non-verbal way.

As far as it was concerned, the mode of writing and its teaching style has changed significantly over the years. The traditional way of teaching writing was delivered through recitation and memorization techniques (Kawinkoonlasate, 2021) leading to a trained memory and retention. Whereas the modern way of doing things involves interactive methods supported by technology utilization. In this era, developing sophisticated writing has been popularized as electronic based writing or e-writing (Rohayati & Friatin, 2021; Rohayati & Rahman, 2023) Its development is expeditious and has a high-tech of updated version (Li et al., 2024; Song & Kim, 2024). One of the presences of technology is AI, hereinafter society was familiar with Generative Artificial Intelligence (Gen-AI) which needs critical thinking skill for an effective Gen-AI use (Tian & Xiang, 2026). This platform is designed to make human life's more straightforward (Margetis et al., 2021) and serves as a tool for cognitive transformation, mainly, in enhancing writing argumentative skill (Valerio & Theresa, 2025), so that it is considered as a cognitive transformation assistant rather than merely procedural assistance (Gao et al., 2025). For this reasons, students must be equipped with the sufficient guidance to formulate prompt engineering techniques properly (Korzynski et al., 2023; Walter, 2024; Yin & Jiahao, 2024).

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The manifestation of Gen-AI contributes in many sectors, especially in education, to specify, in Academic Writing (Kim et al., 2025; Rodafinos, 2025; Schiff, 2022; Nartgün & Kennedy, 2024; Tanveer et al., 2020; Dhyani et al., 2024; Alam, 2021). Gen-AI could contribute to the human lives such as daily conversation, responsive partner, as well as a guide to assist multiplex affair, matter or errand, which stated by Wang et al. (2024) and Muthmainnah (2024)), even as a problem solver in a specific way (Valavanidis, 2023). The activity of e-writing involving technology of Gen-AI provision cut the writing duration and contributes to the innovative, creative, and sophisticated written work (Rohayati & Friatin, 2021; Rohayati & Rahman, 2023). This circumstance is due to Gen-AI provision in rapid answer and information to cater user's needs (Yamini et al., 2025) and it is become time-saving (Labadze et al., 2023; Chi et al., 2021; Ait Baha et al., 2024). Moreover, it is beneficial to provide students an assistance to consulate or sharing about their ideas (Hu et al., 2025), brainstorming (Scala et al., 2025)), asking many favors in a wide scope, and it could be taken as a mate to discuss with (Yan et al., 2024; Chen et al., 2025; Marrone et al., 2025; Qin & Lin, 2025). This imply significantly that Gen-AI contributes resourcefully in improving university learners English writing (Lee et al., 2024; Kim et al., 2025). Thus, the integration of technology provides satisfying mode for human lives in this century.

The content of Gen-AI, such as ChatGPT, Gemini, and others, provides a valuable reading resources for students to sharpen their critical thinking in writing argumentative. It is to say that writing activity forces students to read many resources in frequently way to reinforce their thought (Napa-Rodríguez, 2025; Khanum & Naryanappa, 2025; Magsalin, 2023). The activity of reading a lot makes students more knowledgeable and has various perspectives that can be expressed in their writing (Hidayat, 2025; Shams, 2024). To sum up, reading a lot, as an initial steps in developing critical thinking, can be reach both in an online or offline resources way as a magnificent supplement for reading comprehensions and writing skill.

Despite a Gen-AI demonstrates its positive impact, yet it still always found out of its cracks. To specify; students' development of critical thinking are impeded (Hassen, 2025) due to the fact that students are too much to rely on Gen-AI (Suryanto et al., 2025; Szmyd & Mitera, 2024; Scibelli & Stevens, 2024). To overcome those cracks, it is totally required by the academic to utilize the Gen-AI in a wise way (Çela et al., 2024; Sholikhah et al., 2024; Azman & Tümkaya, 2025) when it is used in a classroom atmosphere, especially in a subject of Academic Writing; This is aimed to develop the students' competency in critical thinking (Rohayati & Rachmawati, 2021; Rohayati & Friatin, 2021) so as to create a shining and brightening essay. In that case, a strategy to deal with those issues should be coated by guiding the students in implementing a great prompting (Walter, 2024). To get the exact answer of information by Gen-AI, it is necessary for the user to provide prompting (Oppenheim, 2018; Hutson & Robertson, 2023; Korzynski et al., 2023; Nadeem et al., 2025) in a good way which supported by critical thinking element.

Six prior studies offer a great influence to the recent study which involving Gen-AI in sharpening students' critical thinking in writing argumentative text. Suh et al. (2025) explored utilization of ChatGPT to 1) cultivate critical thinking in L2 argumentative text by ChatGPT Guideline for Critical Argumentative text (CGCAW) framework; and 2) to incorporate the Paul-Elder Critical Thinking Model (PECTM) and Tan's framework resulting in clarity, logical coherence, and evidence use both critical thinking and writing proficiency. Secondly, Hong and Guo (2024) reported that Gen-AI contributes and encourages critical thinking meritoriously, to specify: proposals miscellaneous viewpoint, feedback and discussion spur. In their study, Oliveira et al. (2025) introduced the Perceived Critical Thinking Disposition of Generative Artificial Intelligence (PCTD-GAI) in fulfilling six critical thinking dispositions (reasoning, access to justice, search for evidence, and search for truth, open-mindedness, and systematicity).

The other three previous study are El Maamri (2025), Hong et al. (2025) and Ruiz-Rojas et al. (2024). El Maamri (2025) declared that writing process based argumentation in didactic scripting at specific moments by assimilating Gen-AI, combined with dialogic learner/conversational agent method stimulate for a nimble learning and iterative establishing in cultivate student's proficiency in argumentative and critical thinking. Hong et al. (2025) examined the students' critical thinking in writing English essay with the guidance of Gen-AI. Ruiz-Rojas et al. (2024) highlight the essential of exploring technology (Gen-AI) as a form of students' potential in transform pedagogical practice on critical thinking and collaboration. Although Darmawansah et al. 2025; Yin and Jiahao (2024), Mahdavivand Fard (2025)

and Valerio and Theresa, (2025) has studied the similar area of present research, very limited study reported on the combination of traditional writing and e-writing using Gen-AI in composing argumentative text to optimize critical thinking using the model of four stages (Figure 1), case study and semi-structured interview. Specifically, Darmawansah et al. (2025) focuses on speaking, Yin and Jiahao (2024) and Mahdavivand Fard (2025) employed quasy experimental method and t-test; while Valerio & Theresa (2025) utilized the comparative study. Unlike the previous studies aforementioned, the current study, specifically, intends to explore 1) how does the integration of traditional writing and e-writing using Gen-AI empower students' critical thinking in composing argumentative texts?; and 2) students' voice on the implemented model of traditional writing and e-writing using Gen-AI in constructing argumentative text to empower critical thinking. The current study might be result in a great implication in 1) the existing area of research topic, Gen-AI in combining with traditional writing and e-writing; 2) literature nuance of hybrid writing model which introduces the model of four stages; and 3) providing educators in latest model of hybrid writing model using Gen-AI.

METHOD

The present study utilized the qualitative paradigm with the type of case study because it deals with exploring how and why the small case was occurred as suggested by Yin (2018). Mainly, the current study is aimed to explore 1) the implementation of traditional and e-writing using Gen-AI to empower students' critical thinking in writing argumentative text; and 2) students' perception of the model. Thus, the selected research design is relevant with the objective of the present study that can provide the educators the insightful knowledge.

Twenty-four of third year students at one of higher education in Ciamis Regency, West Java, were involved in this study. They were selected purposively because 1) it was based on researchers' own judgment, which is consistent with purposive sampling as a widely used technique in qualitative research; and 2) due to the fact that the current research involved small numbers of participants to provide an adequate information. Of all 24 students who enrolled Academic Writing class, only nine students who were selected based on specific criteria and were relevant to the research objectives (Ahmad & Wilkins, 2025; Dahal, 2025). Specifically, they were the Indonesian EFL students in higher Education, had taught and accomplished Academic Writing for one semester using Model of four stages (Figure 1).

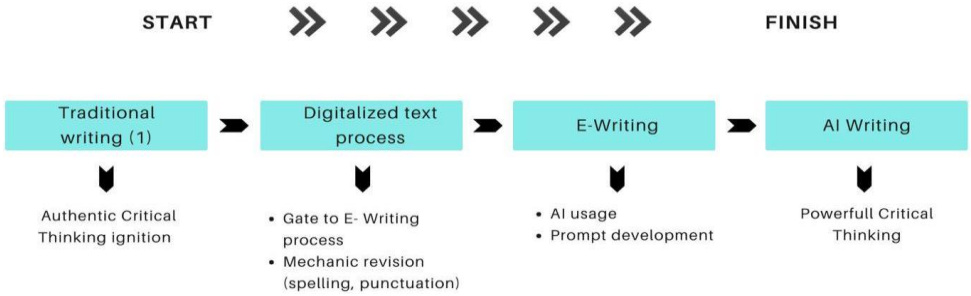


Figure 1. *Model of four stages*

Before conducting the participatory observation which were conducted once, all of students were checked ensuring students' presence. The next was implementing the model of four stages in synergizing traditional and e-writing argumentative assisted by Gen-AI in optimizing students' critical thinking in argumentative text. The model of four stages was recorded in the form of screenshot, which was commenced by students being tasked to write argumentative text traditionally in a confined time (60 minutes), followed by digitalizing and changing into Word (.docx) in a shorter confined time than traditional writing was (30 minutes), polishing the written work assisted by Gen-AI, and publishing in Google Classroom. With regards to traditional writing, the researchers' observed that students felt writing traditionally difficult to include the complete source. Meanwhile, in e-writing activity, students were able to involve source, data, facts serving as strong supporting claims in their argumentative text. There was not intensive interaction between students and Gen-AI because they only formulated a single time of prompt writing delivery. The total length of activity was 90 minutes So, there were no audio and video recorded. This data functioned as

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capturing the real behavior in natural context to fulfil triangulation and comprehensive exploration.

Meanwhile, semi-structured interviews were employed, as these methods are commonly integrated in qualitative studies to capture rich, contextual, and in-depth data (Lim, 2025). Students' perception on traditional and e-writing argumentative assisted by Gen-AI to empower critical thinking ability were revealed by administering semi-structured interview to 9 students. They were categorized into low, mid, and high-level achievers based on GPA (Grade Point Average) or IPK (*Indeks Prestasi Mahasiswa*). To follow Cohen et al. (2013), the semi-structured interview questions in this study were divided into three categories which aimed at finding out 1) students' experiences; 2) students' opinion; and 3) students' knowledge. The last is nine students' argumentative documents text which reflect students' critical thinking elements. These data were independently coded by three raters based on the categorical components, such as Issue/ thesis statement, data/fact, argument, and reason; each was coded as present or absent. Meanwhile, Fleiss' Kappa was utilized to calculate inter-rater agreement among the three raters because there were more than three variables of raters. All of the raters were three researchers who have been trained on how to assess the categorical components in students' argumentative texts.

The observation was analyzed employing thematic analysis approach (Braun & Clarke, 2024) consisting of familiarizing the result of observation, generating codes of data, searching and reviewing themes, defining and naming themes, and reporting. Similarly, semi-structured interview analysis was preceded by familiarizing the students' interview transcription, generating the data category, searching and reviewing central themes, defining the name of themes, and reporting the conclusion of semi-structured interview result. Meanwhile, the nine students' argumentative documents text were measured and analyzed by using the persuasive concept reflected in argumentative text as suggested by Reichenbach (2001). This was done to analyze critical thinking elements reflected in students' argumentative text. All of the data were linked to each other serving as triangulation of the research.

The trustworthiness criteria of the research must be taken into consideration including four dimensions: credibility, transferability, dependability, and confirmability (Rashid & Rasheed, 2026). To follow Ali et al. (2026), trustworthiness was administered through several procedures: First, three researchers as raters independently coded the category of critical thinking components reflected in students' argumentative texts and compared their coding decisions. Subsequently, the discussion took place to reach the agreement and came up with the credibility and consistency of the interpretation. Second, the documents were archived Microsoft Word providing the dependability and confirmability of the analysis. Third, peer debriefing was carried out with language education experts determine the relevance and coherence of the emerging interpretation. Finally, representative participant extracts were included in the Results section to demonstrate the connection between the raw data and the final themes. These procedures manifested the credibility, dependability, and confirmability of the qualitative analysis.

The ethical clearance of the study was obtained from Institute for Research and Community Engagement Universitas Galuh. Meanwhile, the informed consent was obtained from the students which deals with the purpose of the study, their right to withdraw at any time, how their data were used, stored, and protected. Regarding the data, it was not related to real grades of final examination; thus, the data was not used for grading their achievement. In addition, personal identifiers were anonymized to protect data privacy and confidentiality using abbreviation and code. Also, researchers informed students that they had to use Gen-AI ethically for the class objectives and beyond. The researchers instructed and directed students how to use Gen-AI wisely and properly.

RESULTS AND DISCUSSION

The present study is intended to depict synergizing traditional writing and e-writing using Gen-AI to empower students' critical thinking in argumentative text and explore the students' voice on the implemented model. The data were obtained through semi-structured interview, observation, and students' argumentative texts. The result of the analysis data will be delineated in the following organization:

The sequence of traditional and e-writing argumentative text assisted by Gen-AI to empower students' critical thinking

The synergy of traditional and e-writing argumentative text assisted by Gen-AI to empower students' critical thinking comprises four steps which might enrich students' experiences in learning to write without weakening cognitive skill. In the present research, students enrolled

Academic Writing lecture were given a new developing model of writing, mainly focusing on traditional and e-writing argumentative text assisted by Gen-AI. The students' work became a primary data which gained through participatory observation. These documents were collected through three steps:

First, students are asked to write the essays traditionally with the topics of conservations issues reflecting their critical thinking skill in a confined time (60 minutes). This activity is ultimate to maintain students' memory retention (Marano et al., 2025). This result in circumstance at which the students' produce their genuine idea without any interference, and how high their cognitive ability in knowing the world. Their broad knowledge was forced to be issued by memorizing all events and insight they had previously. This corresponds to what are said by Bo & Le (2024), Cui (2026), Özgür Küfi (2023), and Xue et al. (2024), in that, in principle of teaching writing, students' prior/ existing knowledge and experience, must be taken into consideration. However, challenges emerged during the session because it was found that students found traditional writing tiring. Despite the fact that some students were moody, traditional writing was still considered as the most important stages in e-writing (Ekmekçi, 2018). Moreover, based on the result of semi-structured interview, some students found traditional writing is irreplaceable.

Second, the essay then was transferred, digitalized, and filed in a Microsoft word document. After transferring into digital form, the documents of argumentative text, obviously, have not been perfect yet in term of spelling and typography. This is caused by the students' less frequent of writing by using pen and paper as revealed in students' semi-structured interview. Nevertheless, "traditional writing elicited syntactically more complex writing" (Y. Kim & Belcher, 2020) which made the readers and the writers themselves ambiguous. The digitalization is beneficial for essay to be a long-term accessible material or to be "digital preservation" (Rastogi et al., 2024). At the digitalization stage, students found a new insight regarding the digital literacy competence, i.e. knowing new assistance in transferring the traditional written text into digital one using mobile google lens, for example.

Third, students are asked to revised and edited their work assisted by Gen-AI they preferred, such as ChatGPT, Gemini, Meta AI, etc. This process of e-writing is assisted by Gen-AI at which the writer does not have self-revision and editing; instead, Gen-AI acts as a virtual assistant that provides support at every stage of the writing process (Reis & Melão, 2023). This stage boosts the students' powerful critical thinking in argumentative text and concurrently produce the innovative written work (Rohayati & Friatin, 2021). The reason is that, students have successfully added fact and data to support their claim and opinion, exemplified by in-text citation and derived from precious and relevant resources (Table 1).

Fourth, the process of publication is the last steps at which students were required to submit their work via Google Classroom, hereinafter referred to as AI writing. This last process of writing shown that students have been assisted to empower critical thinking in argumentative text (Figure 2) that meet the norm proposed by Reichenbach (2001) on argumentative elements and the higher level of Taxonomy Bloom (Krathwohl, 2002), namely creation. That is not all, this also relevant with Yin and Jiahao (2024) in that students' prompt skills can be ensuring a synergistic interaction with Gen-AI in writing argumentative text; thus it is to say that using AI as a tool for cognitive transformation as well as trigger students' critical thinking in writing argumentative text (Gao et al., 2025; Mahdavivand Fard, 2025).

Students' documents of argumentative text

As previously mentioned, the students' document of argumentative texts was also considered as primary resources data to meet the triangulation. These document texts were analyzed by using Reichenbach' theory (2001) who propose several elements included in an effective argument. The result of students' document indicates that student's limitation in producing argumentative text traditionally in confined time results in incomplete essay and less powerful critical thinking skill. However, the prompt writing (Figure 2) reveals that students dominantly had awareness of the elements in writing an effective argumentative text. This supports the semi-structured interview data at which mostly students mentioned all elements of critical thinking in writing argumentative as claimed by (Reichenbach, 2001). As can be seen in Table 1, after using Gen-AI, students have been successfully demonstrated all elements of critical thinking in argumentative text which are issue/ thesis statement, argument, reason, facts/ data, and opinion; this is supported by the concrete example in Figure 3.

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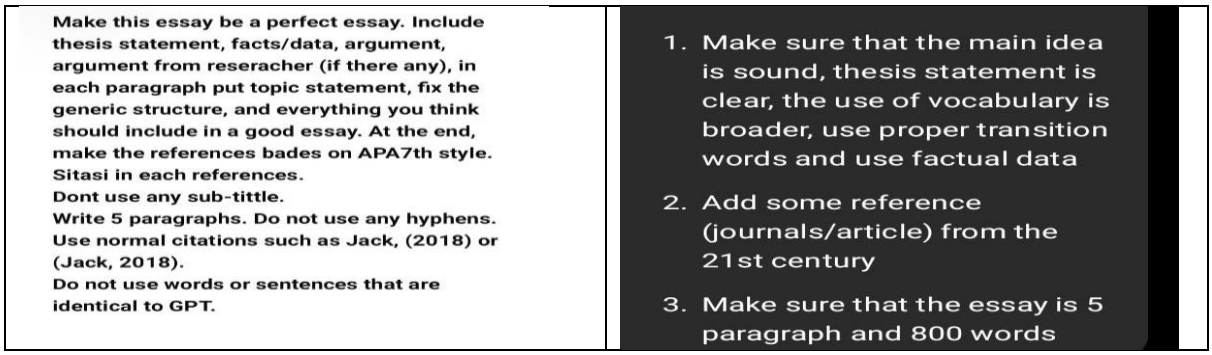


Figure 2. *Students' prompt e-writing assisted by AI*

As given din Table 1, before using Gen-AI, it indicates that students' documents of traditional writing argumentative mostly did not demonstrate thesis statement, as demonstrated by all low achievers and 1 mid achiever). This might imply that students were still less ability in developing thesis statement in their opening paragraphs. This is in contrary to the high achievers and 2 mid achievers who include thesis statement clearly stated in their essay. It can be concluded that students' critical thinking reflected in argumentative was weakened by their inability in formulating thesis statement and fact/ data.

With regards to facts and data, before using Gen-AI, 3 of 9 students from each achiever could not present fact and data in their essay. This might be caused by their less routine in reading a lot which obviously plays a role as the first stages of cognitive level (Bloom, 1956) indicating critical thinking skill. Accordingly, the stages of critical thinking portraying cognitive level consists of remember, understand, apply, analyze, evaluate, and create (Anderson & Krathwohl, 2001). Individual's critical thinking is commenced by knowledge which can be elicit through reading a lot about world phenomenon (Hidayat, 2025; Shams, 2024). This forces every individual to remember all of the knowledge so that he or she can share information to other both written and orally.



Figure 3 *Example of critical thinking elements in student's argumentative text*

It is very fortunate that students' argumentative text was more powerful after being assisted by Gen-AI. The incomplete essay had increased in paragraphs showing effective arguments and reason as required by the teacher in text citation indicating relevant resources and portraying clear and precious facts/ data. It means that the essay structure had enriched by the transition signals leading to the text coherence. Through their prompt writing, it was found that students had awareness of aspects of argumentative text at which it must commit the generic structure, needs the involvement of thesis statement, argument, reason, fact/ data, and opinion. These are also endeavored by students during semi-structured interview; and, thus it is in line with Suh et al. (2025) who found that utilization ChatGPT in L2 argumentative text writing increased in clarity, logical coherence, and evidence involvement.

Table 1. *Analysis of critical thinking elements in students' argumentative text*

Students' essay	Before using Gen-AI					After Using Gen-AI				
	I/ TS	A	R	F/ D	O	I/ TS	A	R	F/ D	O
Essay 1-LA 1	-	√	√	-	√	√	√	√	√	√
Essay 2-LA 2	-	√	√	√	√	√	√	√	√	√
Essay 3-LA 3	-	√	√	√	√	√	√	√	√	√
Essay 4-MA 1	√	√	√	√	√	√	√	√	√	√
Essay 5-MA 2	-	√	√	-	√	√	√	√	√	√
Essay 6-MA 3	-	√	√	√	√	√	√	√	√	√
Essay7-HA 1	√	√	√	√	√	√	√	√	√	√
Essay 8-HA 2	√	√	√	-	√	√	√	√	√	√
Essay 9-HA 3	√	√	√	√	√	√	√	√	√	√

Note: LA=Low Achiever
MA=Mid Achiever
HA=High Achiever
I/ TS= Issue/ Thesis Statement
A= Argument
R=Reason
F/ D=Facts/ Data
O= Opinion

It is notably that students' argumentative text was more powerful after being assisted by Gen-AI. The incomplete essay had increased in paragraphs showing effective arguments and reason as required by the teacher; in text citation indicating relevant resources portray clear and precious facts/ data; the essay structure had enriched by the transition signals leading to the text coherence. Through their prompt writing, it was found that students had awareness of aspects of argumentative text at which it must commit the generic structure, needs the involvement of thesis statement, argument, reason, fact/ data, and opinion. These are also endeavored by students during semi-structured interview. These findings are in line with Suh et al. (2025) who found that utilization ChatGPT in L2 argumentative text writing increased in clarity, logical coherence, and evidence involvement.

How do they perceive towards the implemented model?

It has been explained previously that nine students were involved in the current study representing low, mid, and high achievers. In investigating students' perceptions towards the implemented model, the semi-structured interview was used which categorized into three major themes: experience, opinion and knowledge. These themes demonstrate students' meaning-making in real and natural setting towards the model implemented in the learning process, how they viewed the implementation of traditional writing and e-writing argumentative using AI-assisted writing, and how they aware of traditional writing and e-writing assisted by AI, and the relationship between argumentative text and critical thinking. Mostly, students perceive the implemented model positively because they have a new insightful experience, opinion, and knowledge in digital literacy, argumentation, traditional and e-writing, and critical thinking.

> "Through this model, traditional writing plays a role as barnstorming that can tighten memory; meanwhile, e-writing create an innovative work and provide a new insight about digitalization easily. At the digital stage, the mechanic aspect and the structure of text is polished using AI; consequently, the writer must be accustomed to write a reliable and effective prompt writing to direct AI (High Achiever)

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> This model has improved my writing in the aspect of sentences, ideas, and references due to teacher's model and AI assistance. Traditional writing trained my basic skills and memory, while AI assisted students in producing effective writing. E-writing using AI is effective, practical, easy to edit, and useful for adding references (Mid Achiever)
>
> Traditional writing trained our handwriting and helped ideas stay longer in our brains. We also used Google Lens and AI to check our writing and think more deeply (Low Achiever).
> (1st Interview Transcription of May 13th 2026)

To dig out the students' experience (1st Interview Transcription of May 13th 2026) toward the implementation of the model, the question was formulated as follows: "Could you describe your experience in the Academic Writing course using an AI-assisted e-writing model integrated with traditional writing in composing argumentative texts to strengthen critical thinking skills?" The result of students' interview reported that the combination of traditional writing and AI-assisted e-writing created a balanced learning environment. All participants emphasized that traditional writing trained them to think, recall ideas and organize arguments independently, and stimulate memory retention (Kawinkoonlasate, 2021). This experience support the Constructivist Learning theory as exemplified by Yang (2024) in that students also utilized various self-regulated learning strategies to improve and navigate writing skill by boosting their active "cognitive strategies, goal setting, self-evaluative standards, self-selected models, and mental imagery".

They also perceived the model give significant benefit because e-writing using Gen-AI tools assisted them in improving vocabulary, grammar, mechanics, sentence structure, and idea development. In addition, Gen-AI accelerated the writing process by 1) providing references, brainstorming support, and feedback for argumentative texts; and 2) generating broader perspectives and references. While another explained that AI-assisted writing made the text more practical, organized, and innovative. One student from high achievers noted that the result of AI can work maximally when the writer can produce an effective prompt writing.

Regarding the opinion depicted in 2nd Interview Transcription of 13th May 2026, the interview question is delivered in the following formula: "What is your opinion about the Gen-AI-assisted e-writing model integrated with traditional writing in composing argumentative texts for strengthening critical thinking skills?". Generally, students expressed positive attitudes toward the synergy of traditional writing and e-writing supported by Gen-AI. They believed that the model was relevant to contemporary educational contexts because it combined conventional literacy practices, namely traditional writing and e-writing with modern technology. High achiever said that "*The model would be appropriate for Ge-Z because of AI involvement.* "; followed by mid achiever who uttered that *"Both traditional and electronic writing using AI are beneficial* "; and the last is from low achiever who claimed that, "*The model was pretty good* (2nd Interview Transcription of 13th May 2026). This implied that 1) maintaining traditional writing practices in the digital era is still important; 2) despite the practicality of e-writing, traditional writing should remain part of academic learning because it trained cognitive endurance, creativity, and independent idea construction. This suggests that students did not perceive technology as a reliable tool; instead, they viewed both modes of writing as complementary components that should work synergistically.

In term of knowledge (3rd Interview Transcription of 13th May 2026), students demonstrated a relatively comprehensive understanding of argumentative text and critical thinking through the question of "what elements or aspects are important in argumentative text and critical thinking skills?" Regarding argumentative text, participants identified several important elements, including thesis statements, supporting claims, evidence, facts, data, logical reasoning, counter arguments, rebuttals, and conclusions. They emphasized that argumentative texts should present clear positions supported by reliable evidence and coherent reasoning (Reichenbach, 2001). Some students also mentioned the importance of contextual understanding, topic familiarity, and audience awareness in constructing persuasive arguments.

The students' responses additionally reflected their awareness of critical thinking components. They aware of being effective critical thinkers by mentioning logical analysis, evaluation, problem-solving, and evidence-based reasoning. While open-mindedness was also sounded by the students which refers to critical thinking disposition. In detail, students emphasized that individuals should not accept information from Gen-AI blindly but should verify sources, compare perspectives, and analyze arguments critically. This understanding aligns with the principles of higher-order thinking

skills in Bloom Taxonomy where students are expected to synthesize information and construct reasoned arguments in academic writing.

> "...the important aspect of writing argumentative is generic structure, mainly thesis statement and series of arguments. With regards to critical thinking, knowledge of the topic is important because the writer needs to understand the theme, create a thesis statement, support it with arguments, and make a conclusion which have to be elaborated in a more logical way (High Achiever)
>
> ...argumentative text should include facts, data, evidence, and opinions to avoid ambiguous ideas... understanding the importance of having a clear topic and thesis statement is pivotal.... critical thinking is practiced through thinking logically such as evaluation and analysis. The activities also helped students develop ideas, arguments, opinions, and supporting claims, while expanding our knowledge and insights of argumentative and critical thinking during the writing process (Mid Achiever)
>
> ...argumentative text should contain opinions, data, and clear reasons to support the ideas. Element of critical thinking includes .... argumentative text needs an opening paragraph with a thesis statement, promise to the reader, counter argument, rebuttal, and conclusion ...one of the critical thinking standards is clarity and precious. Being open-minded is open-minded and cross-check information instead of accepting it directly is critical thinking disposition (Low Achiever)
> (3rd Interview Transcription of 13th May 2026).

Interestingly, students also demonstrated knowledge about ethical of Gen-AI utilization. Most participants understood that AI-generated information might contain inaccuracies or biases. Therefore, they stressed the importance of cross-checking references, revising Gen-AI outputs, and maintaining personal authorship in writing as a wise way in managing Gen-AI (Çela et al., 2024; Sholikhah et al., 2024; Azman & Tümkaya, 2025). Some students explained that effective Gen-AI usage requires prior knowledge because users need sufficient understanding to formulate appropriate prompts and evaluate generated responses critically. This indicates that students recognized Gen-AI literacy as an essential component of contemporary academic writing competence.

Another important finding concerns the relationship between Gen-AI and critical thinking. Students believed that Gen-AI could either support or weaken critical thinking depending on how it was used. When students depended excessively on Gen-AI, they perceived a risk of intellectual passivity and reduced analytical engagement. This is in line with what have been said bay several scholars that too much rely on Gen-AI can stuck the ability of critical thinking (Hassen, 2025; Suryanto et al., 2025; Szmyd & Mitera, 2024; Scibelli & Stevens, 2024). By referring to Cognitive Load Theory (Sweller, 1988), too much exposure of Gen_AI without in a haphazard way can caused an extraneous cognitive load, while human working memory is limited. Conversely, when Gen-AI was used selectively for brainstorming, feedback, or idea exploration, students considered it beneficial for enhancing critical reflection and expanding perspectives. This is relevant with Tian and Xiang (2026), in critical thinking skill for an effective Gen-AI use is a must. This dual perception suggests that students possessed a nuanced understanding of Gen-AI integration in education, especially in Academic Writing process.

CONCLUSION

The combination of traditional writing and e-writing using Gen-AI to empower critical thinking in argumentative text provides the students various fruitful insights. Based on participatory observation, the result show that students are equipped by five variables, i.e., in experiencing traditional writing, e-writing, Gen-AI, argumentative structure, and critical thinking understanding. This model might become bridge for students to be an individual who can compete in the global world and think logically. The documents of argumentative text portray students' awareness of argumentative as a media to facilitate critical thinking in writing. The traditional writing result was supplemented by e-writing assisted by Gen-AI to be a complete and effective argumentative text. Thus, students' critical thinking in writing argumentative text sound effective and powerful.

Meanwhile, semi-structure interview comprising three major themes digging out students' experience, opinion, and knowledge towards the implemented model of writing. Their experiences confirm that the model supports writing development, promotes efficiency, and enhances critical engagement with information. Their opinions express positive acceptance of technological integration while simultaneously emphasizing the beneficial value of ethical and balanced Gen-AI utilization. Meanwhile, their

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knowledge demonstrates awareness of argumentative text structures, elements of critical thinking, and the use of Gen-AI literacy practices wisely. Overall, the findings demonstrate that students perceived the integration of traditional writing, e-writing, and Gen-AI as a constructive and meaningful learning model for argumentative academic writing.

The present study provides the implication for stakeholders on using combination of writing mode. Traditional writing increase students' knowledge construction autonomously leading to cognitive development. This maintain students' authentic and original critical thinking. Although e-writing tend to bring students to an extraneous cognitive load, e-writing assisted by Gen-AI results in creative and innovative argumentative text.

The present study suggests that synergizing traditional writing and e-writing assisted by Gen-AI become an effective pedagogical strategy to empower students' critical thinking in academic argumentative text contexts. These findings have been successfully answered the two research questions through multiple data resources resulting in triangulated data. Apart from its features, the current study weakened by the category of questions during interview which only focuses on experience, opinion, and knowledge; small interview sample, single-institution setting, reliance on self-report, and absence of a direct critical thinking assessment. The future research is recommended to broaden comprehensive insight through category of interview question such as students' feeling, contrast and construct forming.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

AI USE DISCLOSURE

The author(s) do not incorporated any type of Gen-AI into their research/writing workflow for it is only used as a tool for seeking information and resources. Following this assistance, the author(s) performed thorough quality control and content revision as needed, maintaining full responsibility for all aspects of the published article."

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COMPETING INTERESTS

The authors declare no competing interests.

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