

บทความวิจัย (Research Article)

Exploring GenAI Impacts on Thai EFL Undergraduates' Writing Process Patterns and Writing Behaviors

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Abstract

GenAI is a critical factor in the learning behaviors associated with students' writing development. The conventional writing process is based on the principles of writing behaviors and process patterns and comprises four or five phases. There is a scarcity of research investigating changes in students' writing process patterns resulting from the use of AI technologies. The objectives of this study were to explore the impacts of GenAI on writing process patterns and to determine the writing behaviors of Thai EFL undergraduates. The research included a survey of 91 undergraduates who were majoring in English. A descriptive statistic was employed to analyze the quantitative data obtained from an online questionnaire. The qualitative data were analyzed using thematic analysis. The findings showed that most students completed the assignment using a variety of writing process patterns, transitioning from the third, fourth, and fifth patterns to the first and second patterns. The students' writing behaviors in the planning and composing stages underwent a substantial transition from self-reliance to AI-reliance after the introduction of GenAI. It may be advisable for educators to monitor students' writing progress by gradually prompting them to reflect on their learning with GenAI and to focus on their writing process rather than assessing their writing proficiency.

Keywords: AI technologies, writing process patterns, writing behaviors

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Introduction

Enhanced writing and assessment processes are becoming increasingly dependent on AI-based tools (machine translation applications like *Google Translate*) and automated written corrective feedback applications (AWCF) like *QuillBot* and *Grammarly*. Researchers (e.g., Altas, 2023; Barret & Pack, 2023) have utilized these tools to improve student engagement in writing. After OpenAI released *ChatGPT*, many scholars have highlighted its considerable potential and explored the implications of its integration into mainstream education (Mizumoto & Eguchi, 2023). Kohnke et al. (2023) argue that GenAI technologies can improve language acquisition among students and streamline assessment processes for teachers. Advanced Large Language Models (LLMs) (e.g., *ChatGPT*) function as writing aids by analyzing prompts and offering accurate feedback on writing assignments (Barrot, 2023).

Scholars agreed that LLM and other AI technologies can serve as beneficial adjuncts to integrity knowledge. Those tools may be utilized by students to intentionally enhance their writing abilities, resulting in modifications to their writing practices through the writing process. Planning, drafting, analyzing, and rewriting are cognitive processes that are similarly reaffirmed in the realm of writing pedagogy as part of the writing process (Hyland, 2022). In educational contexts, various investigations into the application of AI technology (AWCF (Huang, et al., 2020; Marzuki et al., 2023), *Google Translate* (Chompurach, 2021), and *ChatGPT* (Hwang et al., 2025; Yilmaz & Yilmaz, 2023)) have elucidated educators' perspectives on students' writing engagement and their progression during the writing process.

However, GenAI's controversial issues have negatively impacted academic integrity, resulting in a global rise in plagiarism, including learning-to-write habits and academic writing processes. This may influence students to focus on mastering effective prompting instead of relying on their efforts throughout the writing process.

To what extent do AI technologies impact students' writing behaviors throughout the writing process, considering their significance in the writing

development? This study pinpoints the impact of AI technology on students' English writing processes and behaviors to provide the literature for the development of instructional strategies. Many studies on AI technology highlight the deployment of AWCf applications and GenAI as writing instruments to enhance students' writing proficiency. Barret and Pack (2023) acknowledged a study that examined the perceptions and understanding of educators and learners around the incorporation of GenAI into the writing process. Limited research has assessed the influence of AI technology on students' writing behaviors (Jaboob et al., 2024; Kim et al., 2025). Consequently, there is a scarcity of study examining the influence of GenAI on students' writing process patterns to ascertain if they diverge from conventional writing procedures. This research sought to augment the benefits and mitigate the drawbacks of AI-based technologies in pedagogical methods, thereby reconsidering students' writing progression.

Research Objectives

The objectives of this study were

1. to explore the impacts of GenAI on Thai EFL undergraduates' writing process patterns and
2. to determine Thai EFL undergraduates' writing behaviors when using GenAI.

Literature Review

The Interconnected Writing Strategies, Writing Behaviors, and Writing Process

Writing is a crucial linguistic skill that necessitates various components, including language proficiency, the use of transitional phrases, mechanics, writing strategies, and both cognitive and metacognitive skills related to the writing process and its outcomes (Angelova, 1999; Beare, 2000). Writing strategies are a key criterion for identifying effective writers. According to Graham et al. (2016), educators can

offer explicit writing instruction alongside a model-based instructional cycle for students. Educators can directly instruct pupils in various writing strategies. The students can critically implement strategies to fulfill their writing tasks' communicative objectives by observing and assessing preferred writing techniques and evaluating their own work and those tactics. Accordingly, writing strategies and writing behaviors can be interwoven throughout writing processes.

Students could acquire writing skills through Arndt's (1987) eight conventional strategies, which include: preparing for topic selection, outlining the organizational structure of the target genre, drafting the written product with appropriate language features and expression, engaging in language focus activities, re-reading the draft, evaluating the draft, revising the draft for clarity and meaning, and editing the draft for grammatical accuracy. These writing strategies have been systematically grouped along with writing tasks and processes: planning, drafting, rewriting, and editing. He et al. (2011) defined writing strategies as the application of writing behaviors to accomplish writing tasks. Writing strategies encourage students in mitigating obstacles related to terminology, linguistic elements, and rhetorical structures. The students can delineate their writing strategies to enhance their writing performance effectively. These strategies presumably represent a progression of cognitive processes and writing development encompassing planning, composing, assessing, modifying, and editing the final written outputs for interaction with others. Consequently, writing strategies correspond with the writing behaviors or tactics employed during the writing process to enhance writing achievement.

Writing Process Patterns

In the writing process, focusing improving a language is more significant than the quality of linguistic structure and grammatical structure. Steele (2004) delineated the writing process pattern with three stages: planning, peer collaboration, and revision. Nunan and Choi (2023) asserted that one may create and improve virtually flawless writing assignments through a sequence of writing process (evaluation, collaboration, and revision). It can be inferred that the development of writing

skill may be recognized through the implementation of the non-linear process pattern (planning, composing, reviewing, and revising), according to Hyland's (2022) framework, alongside Seow's (2002) and Harmer's (2015) four fundamental phases of the writing model: preparing, creating, rewriting, and revising. Atkinson (2018) asserts that the traditional paradigm emphasizing the significance of meaning and learning development along the writing process: brainstorming, writing, reviewing, rewriting, and revising. Occasionally, the fifth step of the writing process is shared or the final draft of the writing product is published. This is done in the classroom to encourage students to attain measurable writing goals (Sheir et al., 2015; Vanderpyl, 2012). This study outlines the writing process patterns encompassing three to five stages: planning, drafting, obtaining feedback, revising, and editing, in accordance with Atkinson, (2018), Harmer (2015), Hyland (2022), Seow (2002), and Steele (2004).

Writing Behaviors in Writing Process

Writing behaviors at each stage of the writing process can be illustrated as follows. The prewriting stage encourages students to contemplate the topic of interest offered to them. Students may require additional time to investigate information utilizing both online and printed resources. They may engage in discussions and brainstorming sessions with classmates or group members to compile the necessary information and conduct freewriting based on their ideas. Subsequently, students can maintain focus on the perspective, intended audience, and writing objective, and construct an outline based on textual structure. During the drafting phase, students begin to develop the initial draft of the designated genre by synthesizing knowledge alongside their views and experiences pertinent to the subject matter. In the subsequent phase, when students encounter difficulties with their concepts, they may take a moment to review their draft and employ web resources or AI technologies to enhance their writing assignment. During the revision and editing phase, students must proofread and assess the rigor of lexicogrammatical elements, e.g., spelling, word selection, cohesive devices, and rhetorical structures, to refine the final draft to near perfection.

Based on Oxford's (1990) classification of cognitive, metacognitive, affective, and social strategies, this study emphasizes writing behaviors, explicitly the techniques employed after topic selection, which are characterized and integrated with writing behaviors in the pre-launch phase of the writing process. In GenAI, planning constitutes the first phase of the writing process, when students are anticipated to engage in idea discussions and pose inquiries to formulate both broad and specific concepts. In the initial phase of the writing process, teachers will motivate students to explore their subjects and engage with their assignments. Composing several drafts will enable readers (educators and peers) to assess and offer feedback; the discourse among learners should culminate in collaborative learning and the creation of a final document. These methods emphasize holistic unity and coherence, which can be utilized to structure both text and ideas in writing activities. The techniques ultimately emphasize the formulation of a written work characterized by suitable lexico-grammatical elements and rhetorical structures, including spelling, punctuation, word selection, and textual coherence. Instructors subsequently evaluate students' papers and issue grades according to the established criteria. The ratings will represent student success on the writing task (Seow, 2002). This study delineates the writing behaviors associated with the writing process prior to the introduction of GenAI, structured into five stages: planning, drafting, receiving feedback, revising, and editing, as adapted from Atkinson (2018), Harmer (2015), Hyland (2022), and Seow (2002) and the conceptualization of writing behaviors or strategies from these studies (e.g., Abas & Abd Aziz, (2016); Nopmanotham, (2016)).

Utility of AI Technologies in Students' Writing Development

Artificial intelligence (AI) has advanced significantly over the past decades. The implementation of AI technology has enhanced students' language skills and learning behaviors, particularly in writing performance, as observed by certain researchers (e.g., Chompurach, 2021). Regarding the writing behaviors identified by

Aluemalai and Maniam (2020), Barret and Pack (2023), and Fan (2023), students employed AI-driven machine translation applications, e.g., *Google Translate*, and occasionally utilize AWCF tools, e.g., *Grammarly*, to enhance their writing mechanics throughout the writing process. In the recent years, AI was first developed and structured by algorithms, intelligent systems, and extensive data utilizing Natural Language Processing (Zhang et al., 2023). GenAI, or chatbots, is commonly employed to facilitate educational endeavors; as intelligent agents, chatbots engage with users by providing suitable responses to their inquiries (Clarizia et al., 2018). Accordingly, this study investigates AI technologies that impact student behaviors via AI-driven machine translation tools, AWCF, and GenAI in the writing process.

Subsequently, it is evident that these AI-based machine translation tools and AWCF significantly offer effective feedback regarding lexico-grammatical features and rhetorical structures during the writing process and practices. Also, GenAI can enhance the development of student writing (Atlas, 2023; Hong, 2023; Kasneci et al., 2023; Malik et al., 2023; Saunders, 2023) and influence students' behaviors (Jaboob et al., 2024).

Methods

Population and Sampling

The population of the survey study comprised 764 English major undergraduates from the first to the fourth year. This study recruited 256 voluntary informants, with 64 students from each year, in accordance with Krejcie and Morgan's (1970) sample size guidelines. The participants were committed to obtaining undergraduate degrees at a medium-sized university, ensuring the sample's validity. The inclusion criteria were the students must have been assigned by their course instructors to compose written works in English, from a paragraph to research projects and an email to news articles, in alignment with the program structure. Secondly, they must have voluntarily consented to participate after being thoroughly apprised of the study's objectives, methodologies, and planned

application of the research outcomes. After gaining the university ethics committee's approval of the protocol code of study, the researchers requested that voluntary participants complete an informed consent form to serve as informants for online questionnaire. Only 91 participants have submitted their completed questionnaires to the researchers. Although the sample did not attain the anticipated size, a post-hoc power analysis demonstrates that ($n=91$) obtains a statistical power of (.80) for identifying medium effect sizes at $\alpha = .05$. Accordingly, this confirmed that the study had sufficient sensitivity to discover significant trends in students' opinions. The sample comprised 44 males (48.4%) and 47 females (51.6%), demonstrating robust sampling validity in terms of gender. Regarding the study's cohort, 49 participants (53.85%) were first-year undergraduates, while 23 participants (25.27%) were second-year students. Fourteen participants (15.38%) were third-year students. Only five participants (5.5%) were fourth-year students. Furthermore, the data distribution, with a Skewness value of 1.017, was within the acceptable range as advised by George and Mallery (2010). Thus, the premise of normality was carried out, resulting in the data eligible.

Research Instruments

Four parts of an online questionnaire: a 5-point Likert scale of general background, a self-checklist of writing process patterns and writing behaviors, and open-ended questions were developed to ask Thai EFL undergraduates' perceptions to evaluate the changes in students' writing process patterns and behaviors when employing GenAI, in comparison to their traditional writing practices. In addition, the five writing process patterns and a 22-to-29 writing behavior were designed based on literature review.

Before data collection, the instrument was subjected to a thorough content validity assessment by three experts in the field of English Language Teaching (ELT). The items were evaluated for clarity and relevance, resulting in an acceptable Index of Item-Objective Congruence (IOC), so confirming that the instrument effectively measured the target variables. Next, the researchers modified the instruments in

accordance with the experts' recommendations and feedback. After validation, the survey was distributed to four English major undergraduates who volunteered to participate in try-out stage.

Data Analysis

In order to address the research questions, the descriptive statistics (Means and Standard Deviation) and percentages were employed to analyze the quantitative data of the online questionnaire using the SPSS program. The results of the writing process patterns and writing behaviors in the online questionnaire were determined by four intervals (0.8) for rating scale interpretation. To generate the categories of data, thematic analysis was employed to analyze the qualitative data.

Findings

The findings were given to provide insight into the influence of AI technologies on students' writing process patterns and behaviors before and after the introduction of GenAI. Almost all students concurred that they relied on AI technologies to assist them with composing coursework assignments in three distinct capacities. The participants consistently employed *Google Translate* to compose a draft of the coursework assignments (96.70%), in accordance with the conceptualization of writing behaviors and the writing process in English language teaching. The initial choice for AWCF in terms of academic assistance was *Grammarly* (38.67%). Furthermore, the students occasionally employed *ChatGPT* as a writing instrument to verify mechanical errors (33.11%), while *ChatGPT* can serve as a coauthor, assisting them in the composition of writing products (73.62% in frequency).

The Results of Thai EFL Undergraduates' Writing Process Patterns

The findings suggest that the participants' writing process pattern may slightly alter in comparison to the writing behaviors observed in the traditional writing process following the launch of GenAI. Table 1 provides insight into the effects of AI technologies on the writing process patterns of Thai EFL undergraduates. The

traditional writing process patterns consist of four or five stages, grounded in the concept of writing habits and writing process patterns.

Table 1: Thai EFL Undergraduates' Writing Process Patterns

Writing Patterns and Writing Stages	Y 1		Y 2		Y 3		Y4		Total	
	B	A	B	A	B	A	B	A	B	A
1. Writing only one draft (1)	1	1	0	8	3	1	0	1	4	11
2. Planning-> writing only one draft (2)	4	10	0	6	2	3	1	1	7	20
3. Writing the 1 st draft->pausing/reading->revising the 1 st draft (3)	11	10	5	4	3	4	4	3	23	21
4. Planning-> writing the 1 st draft-> asking for feedback-> revising the 1 st draft (4)	18	13	9	1	3	2	0	0	30	16
5. Planning-> writing the 1 st draft-> getting feedback-> revising (the 1 draft)-> editing (the 2 nd draft) (5)	15	15	9	4	3	4	0	0	27	23
Total	49	49	23	23	14	14	5	5	91	91
N = 91		B = Before launching GenAI			A = After launching GenAI					

Patterns 1, 2 and 3 are the anticipated optional patterns from the trial phase. The comparative data of participants' writing process patterns before and after utilizing GenAI is illustrated in the table. Specifically, most students (n=80) selected writing process Patterns 3, 4, and 5, whereas only eleven students acknowledged utilizing writing process Patterns 1 and 2 prior to the introduction of GenAI. Nonetheless, following the introduction of GenAI, 60 students choose to complete their writing assignments utilizing three conventional writing process patterns (3, 4, and 5). Twenty students transitioned their writing process from traditional methods to Patterns 1 and 2. In the second dataset, a larger number of students selected Pattern 1 (N= 7) and Pattern 2 (N= 13) compared to those who chose these patterns in the first dataset. The second dataset revealed a reduced number of students selecting Patterns 3, 4, and 5, with a notable twofold decrease in Pattern 4. Subsequently, it is anticipated that AI technologies may influence the writing phases

of numerous writing processes and may reduce the writing time. Similarly to the qualitative data shown in the excerpts, '*I use it to assist and **save time** rather than letting it fully take over my work.*', the findings illustrated the impact of AI technologies on students' writing process becoming streamlined.

The Results of Thai EFL Undergraduates' Writing Behaviors

As known, the writing behaviors associated with each pattern can be recognized as strategies that assist students in completing their coursework assignments. Table 2 shows frequency of writing behaviors found in each stage of the writing process patterns.

Table 2: Writing Behaviors in Each Stage of Writing Process Patterns

Patterns/ No. of Writing Behaviors	Phase										Total	
	1		2		3		4		5			
	Planning		Writing the 1 st Draft		Asking for Feedback		Revising the 1 st Draft		Editing			
Pattern 1			✓								1 Phase	
Writing Behaviors	B	A	B	A	B	A	B	A	B	A	B	A
			7	11							7	11
Pattern 2	✓		✓								2 Phases	
Writing Behaviors	B	A	B	A	B	A	B	A	B	A	B	A
	10	13	7	11							17	24
Pattern 3			✓		✓		✓				3 Phases	
Writing Behaviors	B	A	B	A	B	A	B	A	B	A	B	A
			7	11	3	3	7	11			17	25
Pattern 4	✓		✓		✓		✓				4 Phases	
Writing Behaviors	B	A	B	A	B	A	B	A	B	A	B	A
	10	12	7	11	5	5	8	11			30	39
Pattern 5	✓		✓		✓		✓		✓		5 Phases	
Writing Behaviors	B	A	B	A	B	A	B	A	B	A	B	A
	10	12	7	11	4	5	8	11	8	11	37	50
Total	30	37	35	55	12	13	23	33	8	11	108	149

The overall number of writing behaviors prior to the introduction of GenAI was less than the frequency of writing behaviors in the second dataset, which recorded 108 and 149, respectively. In the three patterns of the initial dataset, students exhibited writing behaviors in the planning phase with a maximum of 30 occurrences and a minimum of 12. During the initial draft phase, they verified the use of their writing behaviors after the introduction of GenAI, recording the highest frequency (55) across all five patterns and the lowest frequency (11) in the fifth stage of Pattern 5. Tabel 3 demonstrates the result of writing behaviors found in 5 writing process patterns before and after launching GenAI.

Table 3: Writing Behaviors in 5 Writing Process Patterns

Writing Behaviors in Each Pattern		Patterns in 1 st Dataset					Patterns in 2 nd Dataset				
		1	2	3	4	5	1	2	3	4	5
1	Thinking about the interesting topic	-	✓	-	✓	✓	✗	✓	-	✓	✓
2	Searching for information to write the selected topic	-	✓	-	✓	✓	✗	✓	-	✓	✓
3	Using background knowledge relating to the selected topic	-	✓	-	✓	✓	✗	✓	-	✓	✓
4	Preparing vocabulary and grammatical structures	-	✓	-	✓	✓	✗	✓	-	✓	✓
5	Brainstorming or discussing with others	-	✓	✓	✓	✓	-	✓	✓	✓	✓
6	Writing an outline in L1 and translating it to L2 (by using an AI-based machine translation	-	✓	-	✓	✓	-	-	-	✓	✓
7	Identifying writing purpose(s), topic, and audience	-	✓	-	✓	✓	-	✓	-	✓	✓
8	Organizing ideas to make an outline	-	✓	-	✓	✓	-	✓	-	✓	✓
9	Using an online dictionary to find unknown words	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓

Table 3: Writing Behaviors in 5 Writing Process Patterns (continue)

Writing Behaviors in Each Pattern		Patterns in 1 st Dataset					Patterns in 2 nd Dataset				
		1	2	3	4	5	1	2	3	4	5
10	Using an AI-based machine translation application to check word choices	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
11	Imitating the same patterns of the sentences from the model example	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
12	Drafting the first version in L1 and translating it to L2	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓
13	Finding more information while writing the 1 st draft	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
14	Correcting grammar mistakes e.g., spelling, tense, and punctuation) and structures	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15	Using AWCF to check grammar mistakes and sentence structures	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16	Consulting classmates/teacher about ideas	-	-	-	✓	✓	-	-	-	✓	✓
17	Doing peer evaluation to get feedback	-	-	-	✓	✓	-	-	-	✓	✓
18	Asking someone to evaluate the drafts	-	-	-	✓	✓	-	-	-	✓	✓
19	Rereading/reviewing what has been written	-	-	✓	✓	✓	-	-	✓	✓	✓
20	Checking the coherence and relevance of the drafts	-	-	✓	✓	✓	-	-	✓	✓	✓
21	Taking a break while editing the drafts	-	-	✓	✓	✓	-	-	✓	✓	✓
22	Re-checking the drafts and editing	-	-	✓	✓	✓	-	-	✓	✓	✓

Table 3: Writing Behaviors in 5 Writing Process Patterns (continue)

Writing Behaviors in Each Pattern		Patterns					Patterns				
		in 1 st dataset					in 2 nd dataset				
		1	2	3	4	5	1	2	3	4	5
23	Using GenAI to create the topic						x	✓	-	✓	✓
24	Using GenAI to generate the example of the writing task						-	✓	✓	✓	✓
25	Using GenAI to create the first draft						✓	✓	✓	✓	✓
26	Asking GenAI to evaluate the draft and give feedback						-	-	-	✓	✓
27	Using GenAI to check grammar mistakes and sentence structures						✓	✓	✓	✓	✓
28	Using GenAI to add tone, voice, and writing styles						✓	✓	✓	✓	✓
29	Using GenAI e.g., ChatGPT to revise the first draft						-	-	✓	✓	✓
Total		7	15	12	22	22	6	18	17	29	29

✓ = Writing behaviors found x = Writing behaviors not chosen by students

The analysis of participants' writing experiences indicated that the total number of writing behaviors in the second dataset was significantly higher than those observed in the first dataset. In Writing Process Pattern 1, seven writing behaviors were identified at stage one. After applying GenAI in their assignments, only six out of eleven writing behaviors were utilized to complete their tasks. In a manner similar to the two-stage analysis of Pattern 2, 18 out of 19 writing behaviors were identified in the second dataset, compared to 15 writing behaviors observed prior to the implementation of GenAI. Although the total number of writing behaviors in Pattern 3 was lower than in the previous pattern across both datasets, the writing behaviors were represented in different quantities (N=12 and 17). The writing behaviors of comparable students manifested in Patterns 4 and 5 across GenAI and non-GenAI contexts, indicating a notable consistency with the literature (N=22 and 29).

Accordingly, these diverse writing behaviors do not influence the analysis. Figure 1 illustrates writing behaviors observed at each stage of the writing process patterns before and after the implementation of GenAI.

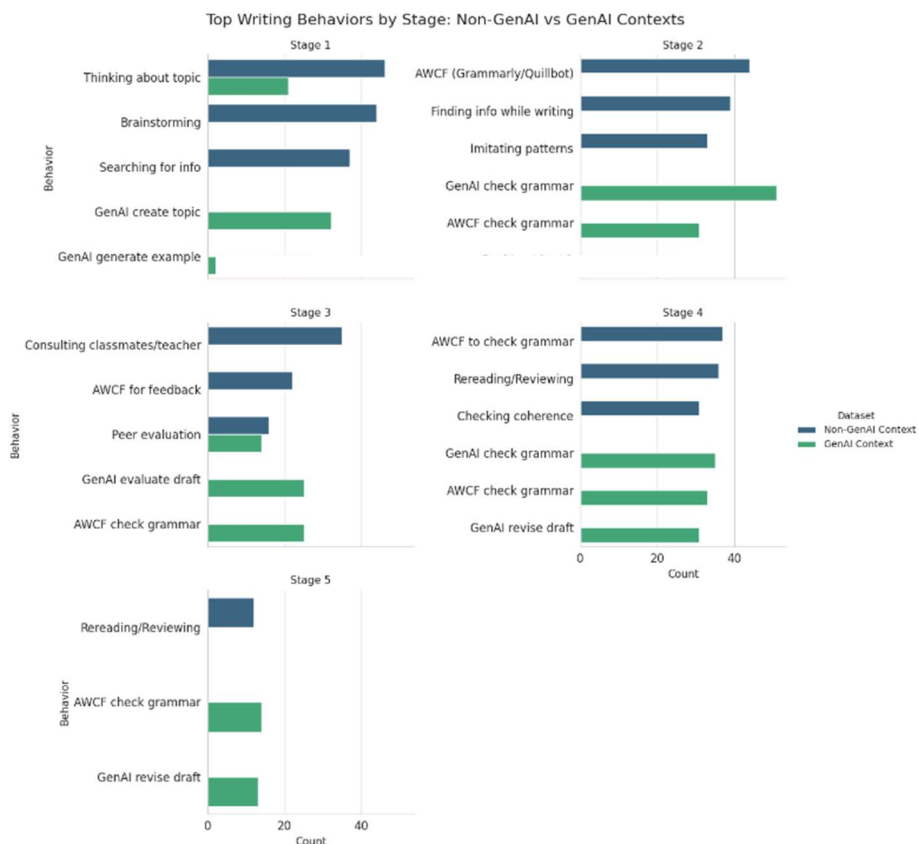


Figure 1: Writing Behaviors in Writing Process

Prior to the introduction of GenAI, Thai EFL undergraduates employed AWCF to verify grammatical correctness and depended on their cognitive processes for ideation and drafting. However, a pronounced over-reliance on GenAI became evident following its launch. In the planning process, 46 Thai EFL undergraduates reported that they anticipated the interesting topic independently and collaborated with their peers, while 32 Thai EFL undergraduates utilized GenAI to formulate the topic. In stage 2, 44 Thai EFL undergraduates independently rectified grammatical errors, whereas 51 Thai EFL undergraduates predominantly utilized GenAI for grammar verification. The initial dataset of 35 Thai EFL undergraduates indicated a

strong dependence on human consultation, primarily with friends and teachers. However, after launching GenAI, 25 of these students utilized the technology to assess their drafts. During the revision and editing phases, Thai EFL undergraduates consistently utilized AWCF and GenAI, whereas those students rarely employed AI-based machine translation tools during the writing process. This may illustrate the transition from concept generation to final editing, specifying the predominant tools (both Traditional and AI) utilized at each stage.

Discussion and Conclusion

Before the launch of GenAI, Thai EFL undergraduates employed AI-driven machine translation applications and AWCF to enhance the quality of their writing tasks. The analysis of this study relies on the impact of AI technologies on Thai EFL undergraduates' writing process patterns and behaviors. GenAI essentially serves as a substantial alternative to prior AI-driven writing tools for Thai EFL undergraduates, facilitating concise and effective writing.

The impacts of GenAI on academic writing approaches and practices are leading to a significant change in Thai EFL undergraduates' writing process patterns. In particular, there is a noticeable shift from traditional multi-stage writing processes (3, 4, and 5 stages) to more condensed stages, as evidenced by the emergence of Writing Process Patterns 1 and 2. The findings from the analysis of Thai EFL undergraduates' Writing Process Patterns 1 and 2 reveal that most first-year and second-year students preferred these approaches over others in relation to their experiences with GenAI in coursework assignments. The students in Year 3 and 4 may exhibit differences in their identification of writing strategies and processes, particularly in how they develop and enhance their writing performance based on their prior knowledge. This indicates that GenAI could serve as an optional writing resource for Thai EFL undergraduates. GenAI and AI technologies in the writing process can significantly enhance Thai EFL undergraduates' writing development by streamlining the stages involved and reducing the time spent throughout the writing

process. Through qualitative evidence, Thai EFL undergraduates acknowledged that they derived this benefit from GenAI. This is supported by Fyfe (2023) and Liu et al. (2024), indicating that GenAI as writing tools could enhance Thai EFL undergraduates' time management efficiency.

Conversely, the writing process may not substantially reduce from five stages to a single stage. Nonetheless, the effects of GenAI on the writing process can be articulated in terms of a shift from self-reliance to over-reliance on GenAI as writing behaviors evolve through various stages, aligning with earlier research (Gayed et al., 2022; Li et al., 2025). This could clarify the distinction between the objectives of learning writing and writing practices compared to conventional writing strategies. The findings indicate that the authors of this study suggest that writing behaviors at each stage of the writing process could be adjusted to develop effective prompts for GenAI programs.

Furthermore, the writing process patterns of Thai English-major undergraduates have been influenced by the introduction of GenAI in their writing tasks. The writing process patterns of Thai EFL undergraduates are expected to undergo a significant transformation, moving from multiple stages to fewer stages. This shift will see a reduction from 4 and 5 stages to a few, specifically Writing Process Patterns 1, 2, and 3. GenAI could greatly influence Thai EFL undergraduates' writing behaviors by increasing their reliance on this technology throughout the writing process. This AI technology has the potential to assist in topic creation, the development of targeted textual genres, and the enhancement of draft quality as shortcut tools, despite the prior use of AWCF for correcting language features and sentence structures before the emergence of GenAI.

In brief, the incorporation of GenAI into their writing practices represented a significant alteration in their writing behaviors and process. GenAI as a writing tool may improve Thai EFL undergraduates' time management during the writing process, resulting in excessive dependence on GenAI in their writing practices. Employing several traditional writing strategies alongside a process-oriented writing approach remains advantageous for Thai EFL undergraduates to develop their cognitive skills

in the GenAI context. How can instructors accurately evaluate students' writing competencies if they choose to employ GenAI during the planning and drafting stages rather than depending on their own abilities? This may be challenged if there is a transition from self-efficacy to reliance on AI. Instructors can monitor students' writing developments by encouraging them to reflect incrementally on their learning from GenAI and prioritize their writing process over evaluating their writing proficiency.

Suggestions

Suggestions for Application

The theoretical implications suggest that writing serves as a strong learning behavior, reflecting a psychological procedure that allows for the explicit expression of ideas throughout the writing process and the development of strategies at various stages of writing. AI technologies, especially GenAI, serve as valuable supportive writing tools that assist students in enhancing their cognitive abilities and writing skills throughout various processes. While students may engage in discussions and brainstorming sessions with peers or group members to compile necessary information and engage in freewriting during the traditional writing process, understanding how to write in the context of AI's influence can greatly enhance their independence during the peer-feedback phase. However, it is contingent upon the individual's personalized learning experience. On occasion, it is crucial to maintain a critical perspective on the implications of an over-reliance on AI in the process of drafting written content. Consequently, their learning engagements and writing behaviors utilizing GenAI have shifted their assessment emphasis towards the writing outcomes.

Suggestions for Further Studies

While concentrating on a homogenous group of participants, it is essential for future studies to include a heterogeneous group from different disciplines to identify the variations and commonalities in students' perspectives regarding the

effects of GenAI on writing process patterns and writing behaviors in quantitative data. Also, the further qualitative studies may employ a longitudinal methodology to investigate the insightful finding.

Declaration of AI-assisted Technologies

The authors employed AI-driven automated written corrective feedback (AWCF [QuillBot]) to proofread and enhance sections of the text throughout the development of this work. Subsequent to utilizing this tool, the writers evaluated and revised the text as necessary and assume complete responsibility for the publication's content.

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