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Autonomous Learning and Students' Perceptions of Automated Writing Evaluation as a Tool to Improve Writing Skills

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Abstract

This study investigates the role of Write & Improve, an Automated Writing Evaluation (AWE) tool, in fostering autonomous learning among EFL students. Additionally, it examines students' perceptions of AWE as a tool for enhancing writing proficiency. Adopting a mixed-methods approach, data were collected from 53 students enrolled in an English Preparation for Standardized Tests course at a public university in Thailand, using questionnaires and semi-structured interviews to assess autonomous learning behaviors and student perceptions. The findings suggest that engagement with AWE supports various aspects of learner autonomy, including independent learning and language awareness. Students generally viewed the Write & Improve intervention positively, particularly in terms of its effectiveness, usefulness, and motivational impact. However, the feedback was perceived as mechanistic and largely restricted to grammatical range and accuracy. The study concludes that AWE has the potential to promote autonomous learning by facilitating learning through feedback and revision. Moreover, students' positive perceptions indicate a high level of acceptance of AWE technology. These findings have pedagogical implications for integrating AWE into autonomous learning frameworks and informing the design and implementation of AWE systems in educational contexts.

Keywords: autonomous learning; perception; writing; automated writing evaluation; Write & Improve

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Introduction

Automated Writing Evaluation (AWE), also known as Automated Essay Scoring (Warschauer & Ware, 2006), is not a recent innovation; its origins date back to the 1960s with the development of Project Essay Grade (PEG) in the United States, which was designed to evaluate written responses previously assessed by human raters (Page, 2003). Since its inception, sustained scholarly interest has focused on the potential of AWE to support both learners and educators in second language acquisition, pedagogy, and assessment (Ranalli & Hegelheimer, 2022). Empirical research on Automated Writing Evaluation (AWE) has predominantly focused on assessing its effectiveness in enhancing students' writing proficiency (Karatay & Karatay, 2024). Findings from these studies have yielded mixed results, highlighting both beneficial and detrimental impacts on students' writing performance, particularly in relation to accuracy, autonomy, and interaction (Ajabshir & Ebadi, 2023; Chen & Cheng, 2008; Dikli, 2006; Sari & Han, 2024; Wang et al., 2013; Ware & Warschauer, 2006).

While technology-assisted language learning is often linked to fostering learner autonomy—an essential factor in successful language acquisition (Reinders & White, 2011)—scholarly perspectives on the extent to which Automated Writing Evaluation (AWE) supports autonomous learning remain divided. Some researchers argue that AWE enables students to better regulate their writing processes and offers increased opportunities for independent learning (Denton et al., 2008; Jubier et al., 2024). Conversely, others contend that AWE is less effective in promoting learner autonomy (Chen & Cheng, 2008). Beyond the empirical impact of technology on learning, students' perceptions of technological tools play a pivotal role in determining the success of their implementation and learning outcomes (Al-Shammary, 2007; Brown, 2009; Jitpaisarnwattana, 2024; Jitpaisarnwattana, 2025; Yan et al., 2023). Al-Khadi and Al-Jabri (1998) support this perspective, emphasizing that the effectiveness of technology integration in education is largely contingent on both students' and teachers' perceptions of its use. More importantly, how students perceive the usage of AWE has implications for the design of AWE systems (Roscoe et al., 2017; MacFarlane & Spring, 2024). Therefore, examining students' perceptions of an Automated Writing Evaluation (AWE) tool is essential to gaining a deeper understanding of its affordances and limitations in providing feedback.

The current study, therefore, aims to investigate if using an AWE program can foster learner autonomy and to investigate students' perceptions of AWE in improving their writing. The study is guided by two research questions:

1. To what extent can the use of Write & Improve promote learners' autonomy?
2. What are students' perceptions of the use of an AWE program to improve their writing?

Literature Review

Learner Autonomy and Technology

Learner autonomy is commonly conceptualised as a learner's capacity to take responsibility for their own learning (Holec, 1981) and is widely regarded as a fundamental objective in language education. Enhancing autonomy in learners not only fosters greater engagement in the learning process but also equips them with the ability to self-regulate their learning beyond the classroom (Reinders, 2018). Emphasis is placed on learners' abilities and the internal changes that they make in the learning process. Being a natural propensity and innate capacity, autonomy is also regarded as an educational goal in many contexts (Teng, 2019). Moreover, the development of learner autonomy plays a crucial role in preparing students for lifelong learning, enabling them to sustain their language development independently (Benson, 2011). However, the degree to which learners can or should

assume responsibility for their own learning differs depending on the specific educational context. When learners are expected to engage in independent learning, they must take personal responsibility for their progress and actively participate in the learning process. In an optimally learner-centered environment, they are not only required to make informed choices regarding the content and methods of their learning but are also encouraged to contribute to the decision-making process (Teng, 2019).

Since its emergence in language education in the 1970s, the concept of learner autonomy has been closely linked to discussions on technology and its role in fostering autonomous learning practices. The interplay between technology and learner autonomy is dynamic and reciprocal. While autonomy shapes learners' perceptions of technology and its role in language learning, technology simultaneously influences the ways in which autonomy is exercised and developed (Lai, 2019). The impact of technology on learner autonomy is often framed within a dialectical discourse that explores the tension between affordances and constraints (Lai, 2017; Reinders & Hubbard, 2013; Reinders & White, 2011). On the one hand, technology is recognised as a catalyst for fostering and amplifying learner autonomy (Little & Throne, 2017; Murray, 1999), as it enhances access to target language environments and provides learners with greater freedom and choice in autonomous learning (Hamilton, 2013). However, technology can also introduce challenges that may hinder autonomous learning (Reinders & Hubbard, 2013). Digital learning environments demand a high level of digital, information, and media literacy, as well as strong self-organisation skills and metacognitive strategies (Hafner, et al., 2015; Jitpaisarnwattana, 2025). Additionally, while technology-mediated authentic language use has the potential to enhance learning, it may also be overly complex or inaccessible, limiting its usability and effectiveness for some learners (Lai, 2019).

Given the affinity of technology and autonomy, a growing body of research has explored the interplay between these two constructs. Since autonomy can be exercised in both formal and informal learning settings, existing literature has examined how different technological tools support autonomy across various educational contexts. This study specifically focuses on the interaction between Automated Writing Evaluation (AWE) systems and learner autonomy in the writing development process, investigating how AWE fosters or constrains self-directed learning behaviors in writing.

AWE and Learner Autonomy

Automated Writing Evaluation (AWE) has been recognised as a valuable tool that supports learners in managing various stages of the writing process, from initial planning to revising multiple drafts (Griffiths & Nicolis, 2010; Wang et al., 2013). Consequently, numerous studies have explored the role of AWE platforms in fostering learner autonomy in writing development. For instance, Hoon (2006) conducted a comprehensive investigation involving university students in Malaysia who utilised *MyAccess* throughout an entire semester. The findings revealed that engagement with the platform enabled students to structure their essay content more effectively, while its graphically organised writing stages provided scaffolding that enhanced their overall writing proficiency. The capacity of AWE to help students organise their ideas and support their writing process was also echoed in Griffiths & Nicolis (2010) and Li (2007). Dikli (2006) explored the integration of the E-portfolio feature within an Automated Writing Evaluation (AWE) system and found that it significantly enhanced learners' awareness of autonomous learning. By utilising the E-portfolio, students were able to track their progress over time, as the platform provided a structured record of completed assignments, multiple writing drafts, performance scores, and instructor feedback. This self-monitoring capability encouraged learners to take greater responsibility for their writing development, reinforcing independent learning behaviors.

In addition, Wang et al. (2013) investigated the impact of *CorrectEnglish*, an Automated Writing Evaluation (AWE) tool, on the writing development of EFL learners at a Taiwanese university. Beyond

improvements in writing accuracy, the study revealed that students exhibited greater autonomy in their learning by actively utilising online resources and digital portfolios to enhance their writing process. Similarly, research by Tang and Wu (2017) suggests that the immediacy and objectivity of AWE-generated feedback plays a crucial role in promoting learner autonomy, as it enables students to engage in self-directed revisions and independent learning practices. More recently, Wang (2025) explored how students perceive the effects of an AWE program, *iWrite*, in an autonomous learning context. The findings revealed that students are predominantly satisfied with *iWrite* as an alternative writing tutor, necessitating minimal human facilitation in their autonomous learning endeavors. They also demonstrated a willingness to make multiple revisions to their writing based on the AWE feedback. Additionally, the results suggest that the accessibility of this AWE tool for out-of-class use may significantly promote learner autonomy, as indicated by increased student engagement and improved self-regulation.

Contrary to the argument that Automated Writing Evaluation (AWE) fosters learner autonomy, some studies suggest that its effectiveness in promoting independent learning remains debatable. Chen and Cheng (2008) found that AWE feedback primarily emphasised text length and grammatical accuracy, potentially limiting students' ability to engage in creative expression and idea development. As a result, some learners resorted to strategic shortcuts to optimise their scores rather than focusing on genuine writing improvement. Similarly, Ding (2008) raised concerns about AWE's suitability for lower-proficiency learners, cautioning that the monolingual nature of AWE feedback could lead to frustration rather than facilitate skill development. The lack of comprehensible feedback might hinder students from constructively engaging with revisions, ultimately impeding their ability to cultivate autonomous writing practices.

Students' Perceptions of AWE

A growing body of research has explored students' perceptions of AWE programs, with findings largely indicating positive attitudes toward their use. For instance, Cheng (2017) examined the influence of online automated feedback on the writing quality of undergraduate students in Hong Kong. The study revealed that learners responded favorably to the instant feedback provided by the AWE system, appreciating its role in facilitating the revision process and improving their drafts. Research has also highlighted students' positive perceptions of AWE systems as effective academic writing tools. Griffiths and Nicolis (2010) examined the implementation of e-Support4U, a web-based AWE platform, designed to support students' academic writing development. The findings indicated that learners valued the flexibility of access, emphasizing the convenience of receiving feedback anytime and anywhere. Additionally, they believed that engagement with the system contributed to enhancing their academic writing proficiency. The immediacy of AWE-generated feedback was also identified as a motivating factor, encouraging students to engage in more practice and refine their writing skills (Denton et al., 2008; Grimes & Warschauer, 2010). Beyond expressing positive attitudes toward AWE programs, students who engaged with these systems also demonstrated a greater commitment to refining their writing skills. Research by Wilson and Czik (2016) found that learners were willing to dedicate more time to writing tasks and revisions, leading to an overall increase in engagement with the writing process. In terms of feedback quality, students generally perceived AWE-generated feedback as beneficial for improving writing accuracy. Specifically, they responded favorably to grammar- and mechanics-focused feedback, recognizing its role in enhancing their linguistic precision (Li et al., 2015; Wang et al., 2013).

Recent research has focused on the factors affecting user perceptions, particularly in the context of AWE technologies. Han et al. (2021) found that students' psychological study preferences influence

their attitudes toward Pigai, with those favoring study assistance tools showing more positive views. Similarly, Miranty and Widiati (2021) investigated differences in student perceptions of AWE systems across academic levels, revealing that all grade levels acknowledge the significance of feedback from these tools. Furthermore, Rosco et al. (2017) explored factors influencing students' perceptions of AWE scoring and feedback, as well as their impact on writing performance, revision behaviors, and system reuse. While initial expectations were modestly shaped by the presentation of AWE capabilities, students' perceptions were primarily driven by direct experience. Notably, these perceptions had little effect on writing performance or revision behaviors. More recently, Wilson et al. (2024) examined teachers' implementation and perceptions of MI Write, finding that positive views on usability and usefulness alone do not guarantee effective adoption. Instead, factors such as curricular alignment, workload integration, administrative support, and educational policy significantly influence how AWE is integrated into instruction.

Although students generally expressed positive attitudes toward AWE, certain aspects of its feedback did not receive the same level of approval. While learners found grammar-focused feedback beneficial, they perceived AWE-generated feedback on organisation and rhetorical devices as insufficient, highlighting the need for teacher intervention to address these areas (Lin et al., 2016). Additionally, AWE feedback was often regarded as vague and repetitive, with an overemphasis on mechanical accuracy at the expense of other critical components of writing (Chen & Cheng, 2008). In a study investigating the combined use of AWE and teacher feedback, students reported challenges in interpreting AWE feedback, suggesting that its clarity and usefulness remain areas of concern (Mohsen & Abdulaziz, 2019).

Methods

Research Contexts and Participants

The study participants were English major students enrolled in the "English Preparation for Standardized Tests" course at a public university in Thailand. The university specialises in arts and languages. The class consisted of 53 students, with demographic data from the questionnaire indicating that 30 were female and 23 were male, with ages ranging from 20 to 23 years. All of the participants had been learning English for more than a decade with the majority having 15-20 years of English language learning. Notably, prior to the intervention, 31 (58.5%) students had experience using automated writing evaluation (AWE) programs, while 22 (41.50%) had never engaged with such tools. Regarding English proficiency levels, as measured by the Silpakorn Test of English Proficiency (STEP), 18 students were classified at B1, 29 at B2, and 6 at C1. They took the test when they entered the university. (See tables 1 and 2)

Table 1 *Background Information of the Participants (1)*

Participants	Age	F	%	Gender	F	%	English language proficiency	F	%
	20	27	50.95	Male	23	43.40	A2	0	0.00
	21	19	35.85	Female	30	56.60	B1	18	12.05
	22	6	11.3				B2	29	63.65
	23	1	1.90				C1	6	24.25

Table 2 *Background Information of the Participants (2)*

Experience using AWE programs	F	%	Years of learning English	F	%
Yes	31	58.50	10–15	17	32.10
No	22	41.50	15–20	31	58.50
			20 or more	5	9.40

The "English Preparation for Standardized Tests" course is an elective designed for English major students at the university. Spanning 16 weeks, the course includes three hours of instruction per week and aims to develop core competencies required for standardized English language assessments. While the focus has historically alternated between IELTS and TOEFL, IELTS has been the primary emphasis for the past five years in response to student needs. The curriculum is structured to address all four IELTS components, with instruction allocated as follows: reading (Weeks 1–3), writing (Weeks 4–8), listening (Weeks 9–11), and speaking (Weeks 12–14). Week 15 is designated for course reflection, and the final examination takes place in Week 16. Generally speaking, the students who enroll in the course are highly motivated and aimed to get IELTS scores acceptable to further their studies or work abroad.

AWE Implementation

Write & Improve (https://writeandimprove.com/) is a freely accessible automated writing evaluation (AWE) platform designed to assess writing proficiency and deliver immediate feedback aligned with the Common European Framework of Reference for Languages (CEFR). The system evaluates writing based on four key criteria: content, communicative achievement, organization, and language (Thao & Vu, 2023). The platform comprises three primary functions: W&I Workbook, Test Zone, and Class View. Once a text is submitted, the system automatically analyzes it according to CEFR proficiency levels, generating instant feedback at both the word and sentence levels. The feedback is visually structured using distinct colors and symbols to enhance clarity and usability (see Fig. 1).

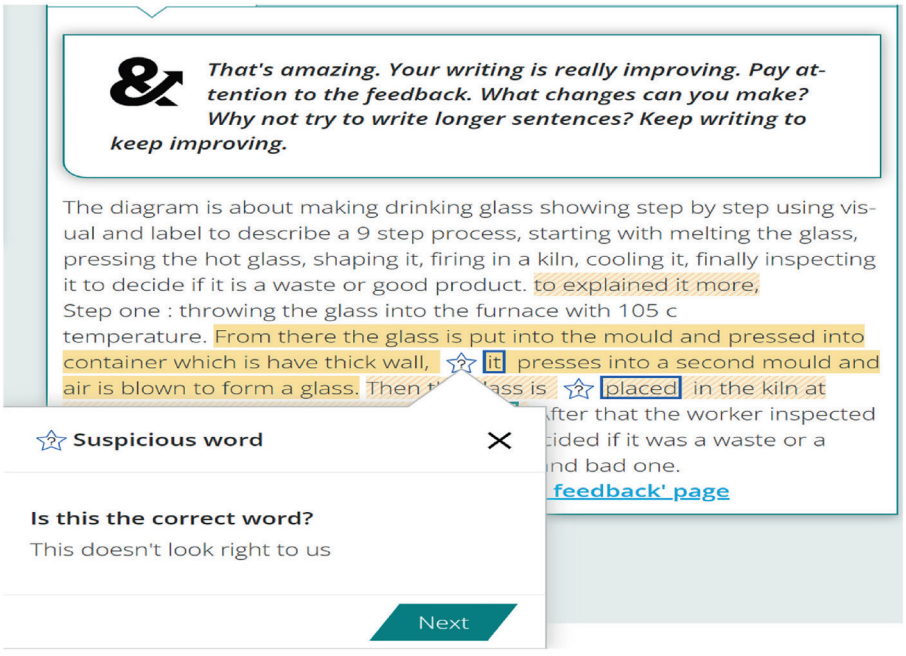


Figure 1 *Feedback from Write & Improve.*

In this study, Write & Improve was implemented as a learning intervention over a five-week period, during which 53 participants engaged in self-directed practice using the platform. Prior to the intervention, an introductory session was conducted to familiarize students with the platform's features, feedback interpretation (color-coded symbols), and the overall intervention structure. This session took place in the final two hours of Week 8, during which the researcher provided detailed guidelines on participation requirements. Each student was expected to complete one Task 1 and one Task 2 writing prompt per week, though they had the flexibility to submit additional responses. Moreover, participants were encouraged to revise and resubmit their drafts multiple times as part of the iterative learning process. The structured four-week intervention was carried out from Weeks 8 to 12.

Data Collection and Analysis

The attitude and learner autonomy questionnaires were administered at the conclusion of the intervention period (Week 13). These questionnaires were disseminated online via Google Forms. All participants (N = 53) completed the questionnaires in a classroom setting immediately following the post-test. The completion process took approximately 20 to 25 minutes. The researcher was present during this session to address any queries participants had regarding the Likert-scale items and open-ended questions. Responses to the Likert-scale items were analysed using the Statistical Package for the Social Sciences (SPSS) version 28.0, with descriptive statistics—including frequency, mean scores, and standard deviations—calculated to summarise the data. The open-ended responses were deductively coded according to five predefined categories: writing improvement, feedback usefulness, feedback quality, motivation, and autonomous learning. Responses that did not align with these categories were coded inductively into emerging themes. To enhance the reliability of the coding process, the researcher conducted the initial coding, while 50% of the responses were independently coded by an English lecturer at a university in Thailand as part of a dual-coding procedure.

Five participants were invited to participate in an interview with the researcher, selected based on their questionnaire responses. To ensure a degree of representativeness within the sample, individuals with positive, neutral, and moderately negative responses were included. The semi-structured interviews were conducted individually via Zoom. While responses were elicited based on the interview questions, participants were also encouraged to discuss any additional issues they considered relevant to the study. To minimize the risk of miscommunication or misunderstanding, the interviews were conducted in Thai. The interviews were transcribed and subsequently translated into English by the researcher. To ensure the validity and accuracy of the translations, the transcripts underwent a back-translation process conducted by two English instructors from the General Education and English Language Centre, Silpakorn University. Consistent with the analysis of open-ended questionnaire responses, interview data were deductively coded based on the five predefined categories. To enhance the reliability of the coding process, the researcher conducted the initial coding, while 50% of the responses were independently coded by an English lecturer at Silpakorn University as part of a dual-coding procedure.

Ethical Considerations

Ethical clearance for this study was granted by the University of Cambridge ethics committee prior to the implementation of the intervention. Participants were provided with an informed consent form and a detailed participant information sheet before engaging with Write & Improve. They were explicitly informed that their participation was voluntary and that they retained the right to withdraw at any stage, including after the study had commenced. All collected data were accessible exclusively to researchers affiliated with Silpakorn University and the University of Cambridge. Although participants were initially identifiable, anonymity was ensured through the allocation of pseudonyms during data processing.

Results

Autonomous Learning Practices in Write & Improve

This section presents students' autonomous learning behaviors as reported in the questionnaire. The analysis was structured around three key dimensions: independent learning, self-awareness and monitoring, and engagement with feedback.

Table 3 *AWE and Independent Learning*

		SD	D	N	A	SA	Mean	STD
Q1	F	0	0	10	27	16	4.11	.698
	Percentage	0.0	0.0	18.9	50.9	30.2		
Q2	F	0	0	10	33	10	4.00	.620
	Percentage	0.0	0.0	18.9	62.2	18.9		
Q3	F	0	0	9	25	19	4.19	.709
	Percentage	0.0	0.0	17.0	47.2	35.8		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree, STD = standard deviation.
Q1: Participating in Write & Improve helped me to become more independent in my learning.
Q2: I can organise and arrange my own learning in Write & Improve.
Q3: Participating in Write & Improve gave me more freedom and control over my learning.

The questionnaire included three items assessing the extent to which Write & Improve supported independent learning. As seen in table 3, the findings indicated a strong level of agreement across all three statements. Notably, 81.1% of participants reported that using Write & Improve enhanced their ability to learn autonomously and manage their own learning process. Furthermore, an even higher proportion (83%) expressed that the platform provided them with greater freedom and control over their learning, particularly in the context of writing practice.

The qualitative findings further reinforce the quantitative results, with several students expressing that their engagement with Write & Improve enhanced their autonomy and self-directed learning. Specifically, they highlighted the flexibility of the platform, emphasizing the ability to learn anytime and anywhere and to track their progress as key factors contributing to their increased independence. This sentiment is reflected in the responses of two students:

> *Yes, I could-control-how I wanted-to learn, when-I wanted to learn, where I wanted to learn and at-what-pace I-wanted-to-learn. (Interview, student-4)*

> *Yes, I think participating in Write and Improve helped me become more independent in my learning. Because it provides me with opportunities to self-monitor, I can practise as much as I need to and use feedback from Write and Improve to improve my writing. (Open-ended-response, student-50)*

Four questionnaire items explored how various AWE features contributed to students' awareness of their learning progress and encouraged self-monitoring. As presented in Table 4, students generally agreed that Write & Improve facilitated tracking their progress and heightened their awareness of their

Table 4 *AWE Features and Awareness*

		SD	D	N	A	SA	Mean	STD
Q4	F	0	0	11	33	9	3.96	.619
	Percentage	0.0	0.0	20.8	62.2	17.0		
Q5	F	0	0	8	27	18	4.19	.681
	Percentage	0.0	0.0	15.1	50.9	34.0		
Q6	F	0	0	10	26	17	4.13	.708
	Percentage	0.0	0.0	18.9	49.1	32.1		
Q7	F	0	0	12	25	16	4.08	.730
	Percentage	0.0	0.0	22.6	47.2	30.2		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree, STD = standard deviation.
Q4: The learner dashboard allowed me to monitor my learning progress.
Q5: Comparing changes made to my writing made me more aware of my learning progress.
Q6: Write & Improve raises my awareness to be responsible for writing, since I can have a second chance to review my own work.
Q7: I am willing to produce more writing because of the convenience of using Write & Improve without the limitations of time and frequency of usage.

learning journey. The descriptive statistics revealed that 79.2% of participants recognised the learner dashboard as a valuable tool for monitoring their development. An even higher proportion (84.9%) reported that the ability to compare revisions across drafts helped enhance their awareness of progress. Similarly, 81.1% indicated that having an opportunity to revise and resubmit their writing fostered a sense of responsibility for their work. Lastly, a substantial majority (77.4%) strongly agreed that the flexibility of unlimited access to Write & Improve encouraged them to engage in more writing practice.

Responses from both the open-ended questionnaire items and interviews indicated that students widely acknowledged Write & Improve as an effective tool for enhancing their awareness of learning progress. One feature particularly valued for self-monitoring was the learner dashboard, as highlighted by Students 3 and 4:

> *For-me, it (learning dashboard) really helped. When I saw the improvements in my scores in the revised version, I went back to see what I did right to improve my writing. I could also observe my own writing and learn about the mistakes I made. (Interview, student 3)*

> *For me, it really helped. Seeing improvements in my scores really encouraged me to keep learning and writing more. Also, I understand more what I had to do to improve my writing and my scores. (Interview, student 4)*

Three questionnaire items aimed to examine the extent to which AWE feedback contributed to the development of learner autonomy. As shown in Table 5, students generally acknowledged that engaging with feedback from Write & Improve played a role in enhancing their writing skills and increasing their awareness of language use. The analysis revealed that 81.1% of participants actively utilised the feedback provided by the platform to refine their writing. Additionally, a significant proportion (79.2%) reported that the process of writing and receiving automated feedback heightened their awareness of linguistic patterns in their work. An even stronger consensus (83%) emerged, with students agreeing that the feedback received helped them develop greater linguistic awareness.

Table 5 *AWE Feedback and Awareness*

		SD	D	N	A	SA	Mean	STD
Q8	F	0	1	10	20	22	4.19	.810
	Percentage	0.0	1.9	18.9	37.7	41.5		
Q9	F	0	2	8	20	23	4.21	.840
	Percentage	0.0	3.8	15.1	37.7	43.4		
Q10	F	0	0	9	30	14	4.09	.658
	Percentage	0.0	0.0	17.0	56.6	26.4		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree, STD = standard deviation.
Q8: Writing and receiving feedback from Write & Improve made me more aware of my language use.
Q9: I used feedback from Write & Improve to improve my writing.
Q10: Feedback from Write & Improve helped me to become more aware of my language use.

The qualitative data further support these findings, with many students expressing that the AWE feedback and the writing-feedback cycle in Write & Improve enhanced their awareness of both their learning progress and language use. This perspective is reflected in the responses of Students 8 and 23 to the open-ended questions:

> *Participating in Writing and Improve helps me improve more of my writing skills, it also corrects my mistakes and makes me aware of the language used in my writing. (Open-ended response, student 8)*

> *Yes, it did. Write and Improve helped me to be aware of some language usage and grammar that-are often incorrectly written without realizing it. In some sentences that I think are well done, I can still edit them and make them better than before with a new composition. It helps me to see where I am wrong when I write my essays. I can write the next essay better and better. (Open-ended response, student 24)*

To conclude, the students thought that participating in the Write & Improve project allowed them to have more control over their learning and become more independent learners. They were also more aware of their learning progress and their mistakes, as well as their language use.

The Students' Perceptions of the Write & Improve Intervention

This section examines students' perceptions of Write & Improve as a writing development tool. The analysis was structured around four key dimensions: writing improvement, perceived usefulness of feedback, feedback characteristics and quality, and motivational impact.

Four questionnaire items explored students' perceptions of writing development through Write & Improve. As shown in Table 6, students generally recognised the platform as beneficial for their writing progress, though the extent of agreement varied across different writing components. A majority (77.3%) believed that Write & Improve contributed to their overall writing improvement, while an even greater proportion (84.9%) agreed that it enhanced their sentence structure and grammatical accuracy. Additionally, approximately two-thirds of the students acknowledged the platform's role in developing coherence in their writing. However, opinions were more divided

Table 6 *Students' Perceptions of Write & Improve and Writing Development*

		SD	D	N	A	SA	Mean	STD
Q1	F	0	0	12	27	14	4.04	.706
	Percentage	0.0	0.0	22.6	50.9	26.4		
Q2	F	0	0	8	15	30	4.42	.745
	Percentage	0.0	0.0	15.1	28.3	56.6		
Q3	F	0	8	21	17	7	3.4	.910
	Percentage	0.0	15.1	39.6	32.1	13.2		
Q4	F	0	5	13	28	7	3.70	.822
	Percentage	0.0	9.4	24.5	52.8	13.2		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree, STD = standard deviation.
Q1: Write & Improve helped me improve my writing skills.
Q2: Write & Improve helped me improve my sentence structure and grammar.
Q3: Write & Improve helped me improve my vocabulary in writing.
Q4: Write & Improve helped me improve the coherence of my writing.

regarding vocabulary development, with 45.3% expressing agreement, whereas 54.7% were either uncertain or disagreed.

Both the open-ended questionnaire responses and interview data revealed a recurring theme among students: Write & Improve was particularly effective in enhancing their grammar and punctuation skills. Many students highlighted this aspect as a key benefit of using the platform. For instance, one student stated:

> *I think my grammar and punctuation have improved the most. As the system corrected my grammar, I became more aware of the mistakes I have made and tried to avoid making the same mistakes again. I understand my grammatical weaknesses so much more. (Interview, student 3)*

Although many students acknowledged improvements in their grammar and overall writing skills, opinions were divided regarding their progress in sentence structure, vocabulary, and coherence. This uncertainty was largely attributed to the limited depth of feedback and lack of detailed suggestions provided by the system. As one student explained:

> *I think my overall writing has improved, especially creating writing outlines and answering the questions fully. My grammar and punctuation have got better, but my sentence structure has not really improved due to the lack of comprehensive feedback from the program. (Interview, student 4)*

Four questionnaire items examined students' perceptions of the usefulness of AWE feedback provided by Write & Improve. As presented in table 7, students regarded the feedback as beneficial, particularly for enhancing grammatical accuracy. A substantial proportion (79.2%) believed that the feedback was valuable for improving their overall writing, while an even larger percentage (84.9%) found it especially helpful for grammar development. Additionally, approximately 60% of students perceived AWE feedback as useful in enhancing coherence in their writing. However, opinions were more divided regarding vocabulary-related feedback, with 49% expressing agreement, while 30.2% remained uncertain and 20.8% disagreed on its effectiveness.

Table 7 *Students' Perceptions as Regards the Usefulness of Feedback*

		SD	D	N	A	SA	Mean	STD
Q5	F	0	0	11	24	18	4.13	.735
	Percentage	0.0	0.0	20.8	45.3	33.9		
Q6	F	0	0	8	17	28	4.38	.740
	Percentage	0.0	0.0	15.1	32.1	52.8		
Q7	F	0	11	16	16	10	3.47	1.030
	Percentage	0.0	20.8	30.2	30.2	18.8		
Q8	F	0	8	12	27	6	3.58	.887
	Percentage	0.0	15.1	22.6	50.9	11.3		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree, STD = standard deviation.
Q5: Feedback from Write & Improve was useful for my writing.
Q6: Feedback from Write & Improve was useful for improving my grammar.
Q7: Feedback from Write & Improve was useful for improving my vocabulary.
Q8: Feedback from Write & Improve was useful for improving my coherence.

The qualitative findings revealed that students generally perceived the feedback from Write & Improve as beneficial for their overall writing development, with particular emphasis on its effectiveness in enhancing grammatical accuracy. This perspective was reflected in the responses of two students:

> *The feedback was effective at pointing out my grammatical mistakes and spellings. (Interview, student 2)*

> *The feedback provided by Write and Improve made it easier to spot grammatical mistakes when writing an essay. (Open-ended response, student 18)*

Nevertheless, the students did not find AWE feedback useful for improving other writing components, mainly because of the lack of clear explanations. For example, two students stated:

> *…the feedback I received only highlighted what was wrong, but did not specify how to correct the mistakes nor how to improve the sentences… (Interview, student 1)*

> *It's useful feedback, but some things like yellow highlights, there's no clear explanation of how to fix it, making it difficult to revise the writing. (Open-ended response, student 18)*

Furthermore, students consistently noted that while AWE feedback was valuable at the word level, its effectiveness did not extend to sentence-level improvements. As one student explained:

> *I think the word-level feedback was generally good, but the sentence-level feedback did not provide me with suggestions, so I did not know what to do or how to improve my sentences. (Interview, student 2)*

Four questionnaire items explored students' perceptions of the nature and quality of AWE feedback. As seen in table 8, he descriptive statistics revealed that a majority (73.6%) viewed AWE feedback as mechanistic rather than humanistic. This perspective was further reinforced by 79.2% of students in Q11, who strongly agreed that AWE could not replace human interaction. However, a significant

Table 8 *Students' Perceptions of the Nature and Quality of Feedback*

		SD	D	N	A	SA	Mean	STD
Q9	F	0	1	13	15	24	4.17	.871
	Percentage	0.0	1.9	24.5	28.3	45.3		
Q10	F	0	0	12	23	18	4.11	.751
	Percentage	0.0	0.0	22.6	43.4	34.0		
Q11	F	1	1	9	27	15	4.02	.843
	Percentage	1.9	1.9	17.0	50.9	28.3		
Q12	F	0	0	8	25	20	4.23	.697
	Percentage	0.0	0.0	15.1	47.2	37.7		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree, STD = standard deviation.
Q9: I think the feedback from Write & Improve is mechanistic, not humanistic.
Q10: I think Write & Improve is interactive because the feedback is instant.
Q11: I think the feedback from Write & Improve is not comparable to human interaction.
Q12: I think the feedback from Write & Improve can highlight my weaknesses very well.

proportion of students acknowledged the benefits of AWE's instant feedback, with 77.4% recognizing its interactive nature and 84.9% agreeing that it effectively identified weaknesses in their writing.

The qualitative findings further support the quantitative results, as students generally perceived AWE feedback as mechanistic and not equivalent to feedback from human instructors, particularly in relation to writing content. This perspective was consistently reflected in responses from both open-ended questionnaire items and interviews. For instance, two students noted:

> *...If I were to compare this with the feedback from teachers I had in the past, I think the feedback from teachers was more useful in terms of providing feedback on content. I think I need more support in terms of content than grammar. I feel that human feedback was more effective than AI... (Interview, student 5)*

> *I think the feedback was mechanistic and there should be more error codes highlighting different types of errors. There should be suggestions on what words should be used or how to improve the sentence. (Interview, student 1)*

Additionally, many students perceived the instant feedback provided by AWE as beneficial, as it enabled them to engage more effectively with the feedback and clearly identify their weaknesses. However, in terms of feedback quality, most students agreed that AWE feedback was primarily useful at the word level. The lack of detailed explanations and constructive suggestions limited their ability to apply the feedback effectively to enhance their writing, as expressed by Student 4:

> *Some of the feedback was great, while some was not. The sentence-level feedback only highlighted that the sentences were problematic, but did not suggest how to improve them. (Interview, student 4)*

Four questionnaire items explored students' perceptions of motivation in relation to their engagement with Write & Improve. As shown in table 9, the findings revealed mixed opinions on this aspect. On one hand, the majority (75.5%) reported that observing improvements in their writing motivated them

Table 9 *Students' Perceptions of Motivation*

		SD	D	N	A	SA	Mean	STD
Q13	F	0	2	15	25	11	3.85	.794
	Percentage	0.0	3.8	28.3	47.2	20.8		
Q14	F	6	14	13	13	7	3.02	1.232
	Percentage	11.3	26.4	24.5	24.5	13.2		
Q15	F	0	2	13	23	15	3.96	.831
	Percentage	0.0	3.8	24.5	43.4	28.3		
Q16	F	0	1	12	25	15	4.02	.772
	Percentage	0.0	1.9	22.6	47.2	28.3		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = neither agree nor disagree, A = agree, SA = strongly agree, STD = standard deviation.
Q13: Write & Improve was a motivational tool for me to practise my writing.
Q14: The badges (awards) I received after having my writing checked motivated me to keep writing.
Q15: The instant feedback from Write & Improve made me want to keep writing.
Q16: Seeing improvements in my writing motivated me to keep learning.

to continue learning. Similarly, a slightly lower proportion of students perceived that instant AWE feedback encouraged them to persist in writing (71.1%) and that Write & Improve served as a motivational tool for writing practice (68%). On the other hand, fewer than 40% of participants felt that the awards received after successfully completing writing tasks incentivized them to continue writing, while a comparable percentage (37.7%) explicitly disagreed with this notion.

Responses from both the open-ended questions and interviews highlighted a recurring theme among students: the immediacy of AWE feedback served as a motivating factor, encouraging them to continue writing and revise their work promptly. This sentiment was echoed by Student 3 and Student 38, who stated:

> *Yes, I think it did motivate me to keep writing. When I got feedback right after I finished writing, it made me want to revise my writing and get a higher score. (Interview, student 3)*

> *Yes, because it encourages people to write for its instant and easy to understand type of feedback. (Open-ended response, student 38)*

However, one student mentioned that the lack of quality feedback made her lose motivation to keep improving her writing:

> *The sentence-level feedback was quite difficult to understand. I tried to revise the sentences many times, but still got the same feedback so I lost the motivation to revise the sentences. (Interview, student 4)*

In summary, students generally perceived AWE as a valuable tool for enhancing their overall writing proficiency, particularly in terms of grammatical accuracy. However, its effectiveness was less pronounced for other aspects of writing. Moreover, AWE feedback was largely considered useful at the word level, while sentence-level feedback was often regarded as unclear and difficult to interpret. Lastly, the immediacy of AWE feedback played a motivational role, encouraging students to continue refining their writing skills.

Discussion

Autonomous Learning Practices in AWE Programs

Overall, students perceived the *Write & Improve* intervention as a valuable tool for fostering autonomous learning practices. Their engagement with the platform enabled them to exercise greater control over their learning, granting them the flexibility to structure their own study routines and cultivate independent learning habits. Additionally, students reported that the system helped them track their progress more effectively, enhancing their awareness of their academic development. Beyond monitoring their overall learning trajectory, they also noted increased linguistic awareness, particularly in relation to the language used in their writing.

In terms of independent learning, students expressed strong agreement that their engagement with *Write & Improve* enhanced their ability to learn autonomously while granting them greater control over their learning process. This can be attributed to the design of the intervention, which provided flexibility by not imposing specific guidelines on how, when, or where students should use the platform. Beyond the introductory session and the minimum task requirement (one Task 1 and one Task 2 per week), students had the freedom to interact with the program at their own pace and in a manner that suited their learning preferences. By having to make choices about their learning, learners may develop a sense of agency, as well as the capacity to exert control over the course of their learning (Teng, 2019).

A recurring theme in student responses was the convenience of being able to practice writing and receive instant feedback anytime and anywhere. Additionally, the implicit nature of AWE feedback may have further contributed to self-directed learning behaviors. In many cases, *Write & Improve* merely flagged potential language issues without directly providing corrective suggestions, prompting students to seek external resources to refine their drafts. This process likely reinforced autonomous learning strategies. These findings align with previous research, which has consistently shown that AWE programs enable learners to structure their writing development independently and become more self-reliant in mastering writing skills (Griffiths & Nicolis, 2010; Hoon, 2006; Li, 2007).

Regarding learning awareness, students reported that *Write & Improve* enabled them to track their progress effectively through the learning dashboard, as well as through the ability to compare revisions and review multiple drafts of their work. This heightened awareness can be attributed to the various features provided by the platform. Specifically, the learning dashboard allowed students to monitor their scores and improvements across both individual tasks and multiple assignments, offering a comprehensive overview of their development. Additionally, key AWE functionalities—such as the ability to submit multiple drafts and clearly visualise changes—helped students identify their strengths and areas for improvement, fostering a more structured approach to self-regulated learning. Empirically, this study extends existing research by offering a nuanced perspective on previous findings, which similarly suggest that AWE platforms enhance students' awareness of their learning progress by providing a record of completed assignments, writing drafts, scores, and feedback (Dikli, 2006; Wang et al., 2013).

With regard to language use, students reported that both AWE feedback and the writing process itself enhanced their awareness of linguistic accuracy. Many participants indicated that they actively incorporated AWE-generated feedback into their revisions to refine their writing. Additionally, qualitative data revealed that students became more conscious of recurring language errors, particularly those related to grammar. Given that Write & Improve primarily targets grammatical accuracy and mechani-

cal correctness, engaging with multiple rounds of feedback and revisions likely reinforced their understanding of key grammatical structures. The finding that students demonstrated increased linguistic awareness, especially regarding grammatical accuracy, aligns with previous research highlighting the effectiveness of AWE in reducing grammatical errors and enhancing overall language accuracy (Li et al., 2015; Liao, 2016).

Students' Perceptions of the Write & Improve Intervention

Overall, students expressed positive perceptions of the *Write & Improve* intervention, viewing it as beneficial to their writing development, particularly in terms of enhancing overall writing proficiency and grammatical accuracy. They also found AWE-generated feedback valuable, especially for identifying and correcting grammatical errors, which contributed to improvements in their writing quality. However, the effectiveness of the feedback appeared to be limited to word-level corrections, with less impact on sentence-level refinement. Regarding the quality of AWE feedback, students acknowledged its usefulness in pinpointing weaknesses in their writing. Nevertheless, they perceived the feedback as somewhat mechanistic and formulaic, noting that it did not match the depth and nuance of teacher-provided feedback. Additionally, the immediacy of AWE feedback and the ability to track writing progress served as motivating factors, encouraging students to engage in continuous writing practice. However, the learning badges (awards) awarded after receiving feedback did not appear to have a significant motivational impact on their writing engagement.

With regard to writing development, students strongly agreed that their grammatical knowledge had improved, which can be attributed to the nature of AWE feedback, which places greater emphasis on grammar and mechanics. Given that *Write & Improve* primarily focuses on identifying grammatical errors and punctuation issues, it is unsurprising that students perceived notable gains in this area. Interestingly, these positive perceptions of grammatical improvement were not only reflected in students' attitudes but also in their actual writing performance, particularly in grammatical range and accuracy across both tasks. However, students did not perceive *Write & Improve* as particularly helpful for vocabulary development or coherence. This may be due to the lack of explicit feedback on these aspects, as reported in the qualitative data, which suggests that students found the feedback insufficiently detailed in addressing lexical and organizational issues.

Regarding the perceived usefulness of feedback, students found that *Write & Improve* was most effective in enhancing grammatical accuracy and overall writing quality, while its impact on vocabulary development and coherence was comparatively limited. This can be attributed to the nature of AWE feedback, which primarily focuses on mechanical corrections. In contrast, feedback on lexical choices and coherence was often implicit, such as flagging potentially inappropriate word usage without providing specific alternatives or suggestions. These findings, both in terms of writing improvement and feedback effectiveness, align with previous research on students' attitudes toward AWE programs. Prior studies have similarly indicated that learners respond positively to AWE-generated feedback on grammar and accuracy (Li et al., 2015; Wang et al., 2013), while other aspects of writing, such as content development and organisation, are often perceived as insufficiently addressed (Chen & Cheng, 2008; Li et al., 2015; Wang, 2025). Moreover, as far as technology acceptance model (TAM) is concerned, most of the learners in this study perceived *Write & Improve* as useful for their writing. This means that AWE is likely to be adopted by learners with similar profiles and with learning purposes (Scherer et al., 2019).

With regard to the nature and quality of feedback, students generally acknowledged that Write & Improve was effective in identifying weaknesses in their writing. However, they also perceived the feedback as mechanistic and not comparable to human feedback. This observation is unsurprising,

given that AWE systems primarily emphasise mechanical aspects of writing, such as grammar and punctuation, rather than higher-order concerns like content, style, and organisation. Qualitative data further revealed that some students considered AWE feedback insufficient, particularly when compared to their prior experiences receiving teacher feedback. Notably, when analysing the profiles of these students, they all belonged to the advanced proficiency group (7.0 and above), suggesting that higher-level learners require more nuanced, human-generated feedback to refine content development, writing style, and text organization. These findings align with previous research indicating that, despite its usefulness, AWE feedback remains formulaic and falls short in addressing multiple aspects of writing, especially content related elements (Chen & Cheng, 2008; Lin et al., 2015; Wang, 2025).

In terms of motivation, students widely regarded *Write & Improve* as an effective tool for encouraging writing practice. The ability to receive instant feedback immediately after submission served as a strong motivator, prompting them to continue writing. Additionally, the opportunity to track revisions and observe improvements in their work further encouraged students to engage in ongoing learning and skill development. This motivational impact can be attributed to the interactive features of *Write & Improve*, which not only provided immediate feedback but also allowed students to visualise their writing progress through revision tracking and score improvements on the learning dashboard. These findings align with existing research, which has consistently shown that the instantaneous nature of AWE feedback motivates students to write more frequently, improve their writing quality (Denton et al., 2008; Grimes & Warschauer, 2010), and invest additional time in developing their writing skills (Moore & MacArthur, 2016; Wilson & Czik, 2016). Theoretically, the findings suggest that AWE and its features can have positive impact on learners' writing motivation, especially in constructs related to interests and attitudes toward writing (Graham et al., 2022).

Limitations

Due to its exploratory nature, this study has certain limitations that should be acknowledged. First, as a small-scale study (N = 53) conducted with a geographically/culturally homogeneous cohort of Thai learners, the findings may lack generalisability to broader populations or diverse educational contexts. Future research should consider a larger-scale investigation in different settings to enhance the applicability of the results. Additionally, the study was conducted over a five-week period, which may not have been sufficient for the development of learner autonomy in a meaningful way. To gain a deeper understanding of how autonomous learning practices evolve over time, future studies should adopt a longitudinal approach, allowing for a more comprehensive examination of changes in autonomous learning behaviours. Importantly, this study focused primarily on perceptions, but it does not include pre-post writing samples or scores to corroborate claims of improvement, something that should be further investigated in future studies. Finally, due to administrative constraints, this study did not include a control group, which could weaken casual claims even at a perception level. Therefore, a quasi-experimental design study is highly recommended.

Conclusion

As this study represents a single case investigation conducted with one cohort at a single university, it does not seek to assert that the findings are applicable or consistent across different educational contexts. The way students engage with AWE programs and utilise automated feedback is inherently context-dependent, varying across learning environments and individual learner needs. Rather than making broad generalisations, this study emphasises the importance of implementing AWE programs with well-defined pedagogical goals, which can be adapted and replicated in other educational settings. Furthermore, when integrating AWE into instruction, educators must carefully consider the specific affordances of different system features to determine how and to what extent these tools can effectively

support learner autonomy. Finally, it is crucial to acknowledge that technology alone does not constitute a teaching methodology or pedagogy, nor can it inherently foster autonomous learning. Instead, the role of teachers remains central in designing pedagogically sound implementations of AWE that promote learner autonomy and self-directed learning strategies.

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