“I Am Really Satisfied with the Additional Comments from the Teacher”: Insights from Thai Undergraduate Students on Adopting Automated Feedback in Paragraph Writing

Nattapat-orn Chuleethongrerk[1]
Jirada Wudthayagorn[2*]

Abstract

This study aimed to investigate Thai undergraduate students’ perceptions of automated feedback in a process-based EFL writing classroom. Specifically, it explored and compared their perceived usefulness and perceived ease of use regarding two integrated feedback types: Integrated Automated-Only (IAO) and Integrated Automated-Plus-Teacher (IAPT) feedback. Twenty-nine Thai undergraduate students were randomly assigned to either the IAO (n=13) or IAPT (n=16) group. Grounded in a process-based writing approach, both groups initially received teacher-written feedback on content and organization for their first revision. For subsequent drafts that focused on language revision, the IAO group received automated feedback from an Automated Writing Evaluation (AWE) system only, whereas the IAPT group received the automated feedback report that was supplemented with in-focus grammatical explanations from the writing teacher. Each group completed four writing tasks, revising three drafts per task based on their designated feedback type. Following the tasks, a five-point Likert scale questionnaire was given and semi-structured interviews were conducted to examine the students’ perceived usefulness and perceived ease of use. Findings indicated that the IAPT group reported significantly greater perceived usefulness with overall feedback than the IAO group. Specifically, when the teacher supplemented automated feedback with additional explanations, students perceived it as more useful than automated feedback alone, demonstrating that they value teacher involvement despite the availability of automated systems. These findings underscore the importance of maintaining the teacher's role when adopting automated feedback and highlight practical approaches for incorporating it to enhance writing instruction in Thai higher education.

Keywords: automated feedback, automated writing feedback, integrated written feedback, process-based writing

[1] The English as an International Language Program (EIL), Graduate School, Chulalongkorn University, Bangkok, Thailand

[2] Chulalongkorn University Language Institute (CULI), Chulalongkorn University, Bangkok, Thailand

* Corresponding author: Jirada.W@chula.ac.th

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Introduction

For EFL undergraduates, such as Thai students, paragraph writing is often perceived as challenging yet essential for their future careers (Pongsukvajchakul, 2023). To support students' development of writing skills, particularly in process-based writing classrooms, feedback plays a crucial role (Hyland & Hyland, 2006b). By receiving feedback after each draft, students are progressively guided through the writing process toward producing the intended final text (Keh, 1990).

Among various forms of feedback, studies have indicated that feedback provided by teachers is perceived by EFL students as the most preferred (e.g., Alfalagg, 2020; Thirakunkovit & Chamcharatsri, 2019). In Thailand, Wichanpricha (2020) reported that Thai students regarded teacher feedback as one of the primary sources of knowledge on which they rely. However, since many Thai university classes typically consist of 30 to 50 students on average, providing feedback - particularly in process-based writing classes - can be challenging (Dokchandra, 2018). Large class sizes may limit the time teachers have to assess each student's work and provide detailed, individualized feedback (Yu, 2021).

To mitigate constraints in providing human feedback, writing software that produces automated feedback, such as Automated Writing Evaluation (AWE) systems, has been introduced (Hyland & Hyland, 2006b). The AWE systems, such as Grammarly, function by comparing the uploaded texts with an extensive database of writing in the same genre and then generating suggestions for writing improvement (Hockly, 2018). Compared to human feedback, automated feedback can deliver comprehensive feedback in a much shorter time frame (Hyland & Hyland, 2006b). In the context of writing classrooms, Hyland and Hyland (2006b) suggest that the automated feedback could potentially provide students with immediate feedback for writing improvement and help teachers save time, allowing them to focus on other aspects of teaching.

Though AWE systems and automated feedback have been examined in numerous studies, they have primarily focused on evaluating their validity and reliability as writing tools. Greater attention has been given to their technological performance than to their pedagogical effectiveness in classroom settings (Chen & Cheng, 2008; Zhai & Ma, 2022). Consequently, further research is needed on how AWE systems and their automated feedback can be effectively integrated into instructional contexts to better support students' writing (Stevenson & Phakiti, 2014).

Addressing the research gap regarding the integration of automated feedback into process-based writing classrooms, this study aimed to provide insights into how automated feedback generated by an AWE system - Grammarly - can be effectively integrated into EFL writing instruction. Specifically, it explored two approaches to integrating automated feedback within a process-based writing framework: Integrated Automated-Only (IAO) and Integrated Automated-Plus-Teacher (IAPT) feedback. Data were collected through a post-experiment questionnaire and semi-structured interviews to examine the perceived usefulness and perceived ease of use of these two types of integrated feedback (IAO and IAPT) by Thai undergraduate students, with the aim of answering the following research questions:

> Are there any differences in the levels of perceived usefulness and perceived ease of use of students who received different types of integrated feedback: Integrated Automated-Only (IAO) and Integrated Automated-Plus-Teacher (IAPT) feedback? Why? How?

Literature Review

Types of Feedback on Paragraph Writing

Feedback is defined as information regarding the gap between a learner's actual performance and the desired outcomes, which can be used to help bridge that gap (Ramaprasad, 1983). Classified by levels, feedback can be divided into two types: content-level feedback and surface-level feedback (Faigley & Witte, 1981). Content-level feedback focuses on meaning-related aspects of student writing, addressing content-related and organizational issues, such as content development, clarity, accuracy of information, use of transitions, coherence, cohesion, and overall organization of written paragraphs (Pearson, 2022). In contrast, surface-level feedback targets language-related features, prompting students to revise or edit specific forms without altering the conveyed meaning (Clare et al., 2000). This type of feedback commonly addresses grammar, vocabulary, and mechanics – aspects of writing such as verb tense, word form, word choice, articles, prepositions, pronouns, word order, sentence structure, punctuation, and spelling (Pearson, 2022).

Teacher Written Feedback and Automated Writing Evaluation (AWE) Feedback

1) Teacher Written Feedback

Among the different forms of feedback, teacher-written feedback remains the most preferred, as students tend to place greater trust in it than in feedback from other sources

(Alfalagg, 2020; Hyland & Hyland, 2006a). Similarly, in the Thai context, Wichanpricha (2020) reported that undergraduate students regarded teacher-written feedback as the most acceptable and reliable.

Despite students' preference for teacher-written feedback, studies have highlighted certain limitations. First, when writing, teachers are responsible for providing both content-level and surface-level feedback. Research has shown that they often place greater emphasis on surface-level issues than on content-related ones, sometimes unintentionally. Montgomery and Baker (2007) reported that teachers frequently provided more surface-level feedback, despite acknowledging that addressing both content and surface-level aspects leads to more effective outcomes than focusing solely on surface-level issues (Biber et al., 2011). Second, large class sizes, which are common in many Thai universities (Dokchandra, 2018), can make it difficult for teachers to sustain both the quality and quantity of feedback across multiple writing tasks. In such contexts, the workload often restricts teachers' time for assessing each student's work and delivering individualized feedback (Yu, 2021), which may result in less detailed or less personalized comments.

2) Automated Writing Evaluation (AWE) Feedback

Automated Writing Evaluation (AWE) systems are computer programs designed to analyze written texts and generate automated feedback, thereby reducing the time and effort required for human evaluation (Feng & Chukharev-Hudilainen, 2022). The AWE systems function by comparing uploaded texts with extensive databases of writing in similar genres and utilizing statistical modeling and algorithms to analyze features such as syntax, text complexity, and vocabulary. Based on this analysis, AWE systems generate suggestions to support writing improvement (Hockly, 2018).

Among various available AWE systems, Grammarly (basic version) was selected in this study to exemplify how automated feedback can be integrated into EFL writing instruction for three main reasons. First, Grammarly has demonstrated a high level of accuracy in detecting and correcting errors. Ranalli and Yamashita (2022) reported that Grammarly's precision rate in identifying and correcting issues such as spelling, articles, and verb forms exceeds 80%, meeting the accuracy benchmarks suggested by AWE developers. Secondly, while a comprehensive comparison of all AWE systems is not feasible, Sahu et al. (2020) found that Grammarly achieved the highest overall accuracy among the five systems they evaluated. Finally, Jeanjaroonsri (2023) reported that Grammarly is widely used by Thai EFL

undergraduates - the target population of this study - but highlighted that a large proportion of students lacked adequate teacher guidance on how to use it effectively.

At the surface level, AWE systems have been found effective in providing grammatical correction suggestions (Almusharraf & Alotaibi, 2022). They can detect significantly more errors than human evaluators, enabling writers to make accurate surface-level revisions. In a study on the use of Grammarly in an EFL writing class, Thi and Nikolov (2021) found that Grammarly was particularly effective in reducing errors related to subject–verb agreement, singular–plural forms, word form, punctuation, articles and determiners, and prepositions.

At the content level, however, AWE systems are less effective than humans in identifying issues and providing feedback to improve content and organization. They often fall short in addressing areas such as idea development and coherence, where teacher feedback has been shown to be more effective by offering tailored and context-sensitive guidance, including support for generating stronger ideas and improving the overall organization of writing (Bailey & Lee, 2020; Chen & Cheng, 2008; Ghufron & Rosyida, 2018).

Consequently, several researchers have concluded that AWE systems are best utilized as tools for providing surface-level feedback, as they efficiently detect errors and generate suggestions for surface-level revisions. However, they are less effective than teachers in delivering content-level feedback (Bailey & Lee, 2020; Chen & Cheng, 2008; Ghufron & Rosyida, 2018). In line with this, Ghufron and Rosyida (2018) recommended utilizing AWE systems primarily for surface-level feedback, while teachers concentrate on delivering content-level feedback.

Integrating Teacher Feedback and AWE Feedback within a Process-Based Writing Approach

The process-based approach is one of the most widely adopted methods in writing instruction and has consistently been shown to enhance students' writing ability (Graham & Sandmel, 2011). This approach involves a recursive cycle of drafting and revising, aiming to foster continuous development in students' writing skills (Nordin & Mohammad, 2006). To implement this approach in the writing classroom, McGarrell and Verbeem (2007) and Hyland (2003) recommend a three-draft process: beginning with an initial draft, revising content and organization in the second draft, and focusing on language use in the final draft. This sequence enables students to concentrate on one aspect of writing at a time - structuring their ideas first before refining linguistic accuracy.

To incorporate AWE feedback into a three-draft writing structure, previous studies have indicated that writing teachers should maintain their role as content-level feedback providers, whereas AWE systems can be employed to generate surface-level feedback (Ghufron & Rosyida, 2018). Building on this, one proposed pattern of integrated feedback for process-based writing involves assigning teacher-written feedback for content-level revisions and utilizing AWE feedback for surface-level revisions (see Table 1). In the present study, this approach is referred to as "Integrated AWE-only (IAO) feedback," as the teacher is not involved in students' engagement with the AWE feedback.

1) The Integrated AWE-only (IAO) Feedback

In the IAO approach, after submitting their first drafts, students received content-level written feedback from the teacher. They then made content-related revisions and submitted their second drafts. Once the second drafts had been reviewed, the teacher informed students in the following class that they could upload the second drafts to the Grammarly dashboard to receive surface-level feedback. After making revisions based on the automated suggestions, students saved the final version as their third draft.

Koltovskaia (2020) implemented the IAO approach with Grammarly in a process-based writing class. The results were consistent with previous research, confirming that Grammarly achieved over 80% accuracy in identifying and suggesting surface-level corrections. However, analysis of the students' final (third) drafts revealed that only 57% of the detected language issues were corrected. Two factors were cited for this limited uptake: (1) students' difficulty in fully understanding the automated feedback, which sometimes led to incorrect revisions, and (2) students' rejection of accurate automated suggestions due to misjudgment or limited grammatical knowledge. Consequently, the researcher recommended supplementing AWE feedback with teacher feedback to enhance students' understanding and effective use of the feedback they receive.

The notion of supplementing AWE feedback with teacher feedback is supported by both theoretical and empirical evidence. Theoretically, this approach aligns with formative assessment principles, which emphasize the importance of tailoring feedback to students' proficiency levels and providing clear, actionable guidance that supports their progress toward learning goals (Hattie & Timperley, 2007). Since AWE systems deliver standardized feedback regardless of learners' proficiency, students may struggle to interpret and apply the suggestions effectively. Empirically, Ranalli et al. (2017) observed that AWE feedback

occasionally lacks the detail necessary for accurate revisions. Therefore, supplementary teacher feedback - particularly in the form of clarifications or elaborations on vague automated suggestions - can enhance the clarity and usefulness of feedback for students.

As a result, the present study proposes an alternative approach in which the teacher provides feedback on content-related issues, followed by combined feedback from both Grammarly and the teacher on language issues (see Table 1). This integrated approach is referred to as "Integrated AWE-plus-Teacher (IAPT) feedback," as the teacher actively supplements the automated feedback with additional explanations.

2) The Integrated AWE-plus-teacher (IAPT) Feedback

In the IAPT approach, after submitting their first drafts, students received content-level written feedback from the teacher. They then revised their drafts accordingly and submitted second drafts. Once the second drafts were reviewed, the teacher uploaded each one to the Grammarly dashboard to generate surface-level feedback and printed out Grammarly's grammatical suggestion report. The teacher then highlighted selected suggestions and added personalized comments, explicitly addressing areas requiring improvement based on individual students' needs. In the following class, each student received this paper-based mixed feedback grammatical report and revised their drafts accordingly before submitting the third drafts.

Table 1

Key Features of Integrated AWE-only (IAO) and AWE-plus-Teacher (IAPT) Feedback

Type of Integrated Written Feedback	Feedback Source
1. Integrated AWE-only (IAO)	Content level: *Teacher*
	Surface level: *AWE*
2. Integrated AWE-plus-Teacher (IAPT)	Content level: *Teacher*
	Surface level: *AWE + Teacher*

Students' Acceptance of AWE Feedback (Perceived Usefulness and Perceived Ease of Use)

For tools and services that involve technology to be effectively integrated into educational practice, students must first accept their use. Without such acceptance, even highly capable tools may fail to achieve their intended outcomes, regardless of their technical

quality (Davis, 1989). Consequently, evaluating students' acceptance of automated feedback is crucial in integrating AWE-generated feedback into classroom instruction.

Over time, numerous theoretical models have been developed and applied to investigate users' acceptance of technology-related tools and services, including computer systems, digital services and software applications (Han & Sa, 2022). Among the various theories proposed, the Technology Acceptance Model (TAM) is regarded as one of the most influential and widely adopted frameworks by researchers (Silva, 2015). It is presented as a concise theoretical framework for investigating how a technology or technology-related service affects users' acceptance (Han & Sa, 2022). The TAM model was developed by Davis (1989) based on the concept that when users perceive a technology or technology-related service as useful and easy to use, they will be willing to adopt it (Ajibade, 2018).

In Davis's Technology Acceptance Model (TAM), the users' acceptance of technological usage involves two theoretical constructs: perceived usefulness and perceived ease of use. Perceived usefulness is defined as the extent to which an individual believes that the use of technology or a technology-related service would enhance their performance. Perceived ease of use, on the other hand, refers to the extent to which a person believes that the use of technology or a technology-related service would be free of effort. The tool or service that is perceived to be easier to use than another is more likely to be accepted by users.

The perceived usefulness construct includes items such as improving job performance, enhancing effectiveness, making the task easier and overall usefulness. Meanwhile, the perceived ease of use construct encompasses items such as clarity, understandability, flexibility and overall ease of use. These items served as the foundation for developing the questionnaire statements and interview questions used to investigate students' perceptions of the usefulness and ease of use of each type of integrated feedback in this study.

Research Methodology

To collect data, this study followed a sequential explanatory mixed-method design. Upon completing all writing tasks based on the assigned feedback types, students first completed a Likert-scale questionnaire to provide quantitative data on their perceived usefulness and ease of use of the integrated feedback. This was followed by semi-structured interviews to gather qualitative insights. The qualitative data was then used to interpret and elaborate on the quantitative findings (Bowen, 2017; Edmonds & Kennedy, 2017). By drawing on both data sources, the study offered a comprehensive analysis of the effects of two types

of integrated feedback - Integrated AWE-only (IAO) and Integrated AWE-plus-Teacher (IAPT) - on students' perceptions of usefulness and ease of use within a process-based EFL writing classroom.

The Context of the Study

The study was carried out in an intact class of a foundational EFL course for first-year undergraduates at a public university in Bangkok, Thailand. The course covered the four core language skills: listening, speaking, reading, and writing. The writing component focused on two types of expository paragraph writing: problem-solution and cause-effect. As part of the course assessment, students completed two writing tasks for each type.

Population and samples

The study population consisted of first-year students enrolled in a fundamental English course, which serves approximately 5,000 students annually. The sample was drawn from one intact class taught by one of the researchers. Participants were randomly assigned to either the IAO or IAPT group and remained in their assigned group throughout the study.

Although all 31 students in the class initially agreed to participate, two did not complete two of the required writing tasks. Consequently, the final dataset comprised 29 students, aged 18 to 21, with English proficiency at approximately the intermediate level.

In addition, most participants (n = 25) reported prior experience using writing support tools, while a few (n = 4) had not used such tools before the study. The tools most frequently mentioned included QuillBot, Google Translate, Gemini, ChatGPT, Microsoft Copilot, and Grammarly.

Data Collection Instruments

Two instruments were employed for data collection: a five-point Likert-scale questionnaire for quantitative data and semi-structured interviews for qualitative data. Both instruments were designed to examine the perceived usefulness and perceived ease of use of the integrated feedback that the students received (IAO or IAPT).

1) The 5-Point Likert Scale Questionnaire

Guided by the Technology Acceptance Model (TAM) developed by Davis (1989), the questionnaire examined two key constructs of technology-related acceptance: perceived usefulness and perceived ease of use. Each construct was measured using items adapted from

the TAM framework. The internal consistency reliability of the questionnaire was evaluated with Cronbach's alpha (α). Based on the acceptable ranges proposed by George and Mallery (2003), the reliability of all items was deemed excellent, with coefficients ranging from .79 to .92.

Participants indicated their level of agreement with each item on a five-point Likert scale: strongly disagree, disagree, neutral, agree, and strongly agree. To ensure clarity and accessibility, a Thai version of the questionnaire was administered during the final class session, after completion of the experiment.

2) Semi-structured interview

Following the experiment, one of the researchers conducted semi-structured online one-on-one interviews to collect qualitative data that provided deeper insights and expanded upon the quantitative findings. Grounded in the TAM framework, the interview questions were aligned with the questionnaire items, focusing on perceived usefulness and perceived ease of use. Unlike the structured questionnaire, however, the interviews featured open-ended questions, allowing participants to reflect more freely on their experiences and perspectives (Patton, 2002). Additional follow-up questions were posed when appropriate to clarify or extend responses.

A total of twelve students were randomly selected for the interviews - six from the IAO group and six from the IAPT group. To ensure random selection, participant numbers from each group were written on folded slips of paper, placed in separate jars for the IAO and IAPT groups, and then drawn at random.

Research Procedure

To investigate the perceived usefulness and ease of use of integrated feedback of the students, 31 participants from one intact class were randomly assigned to either the IAO or IAPT group. However, as two students in the IAO group did not complete the two writing tasks, the final dataset consisted of 29 participants: 13 from the IAO group and 16 from the IAPT group.

In all classroom sessions, one of the researchers served as the instructor for the course. During the experiment, students studied two types of expository paragraph writing: problem–solution and cause–effect. They were required to complete two tasks for each type, with three drafts per task (see Figure 1).

For each task, students wrote a paragraph of 180–220 words within a 60-minute class time, without using any tools such as dictionaries or writing applications. They were notified when five minutes remained, and all drafts were collected immediately after the 60-minute session. After submitting the first drafts, students in both the IAO and IAPT groups received content-level written feedback from the teacher during the following week. They were then instructed to revise their drafts outside of class based on this feedback. At this stage, students in both groups were informed that surface-level revisions were not required.

After the second drafts were submitted and reviewed by the teacher, the IAPT group's second drafts were uploaded to the Grammarly dashboard by the teacher prior to the following class to obtain surface-level feedback. The teacher then printed Grammarly's grammatical reports, highlighted the three most frequent error types, added clarifying comments, and crossed out any inaccurate Grammarly suggestions (if any). In the subsequent class, while the IAO group took a 10-minute break, the IAPT group received the printed Grammarly reports (see Figure 2) together with a brief instructional session on how to interpret and use the feedback for surface-level revision. Afterward, when the IAPT group took their 10-minute break, the IAO group was provided with a paper-based Grammarly user guide, received a short briefing on how to use the tool, and were reminded of potential inaccuracies through sample demonstrations. They were then instructed to upload their second drafts to the Grammarly dashboard to obtain surface-level feedback (see Figure 3) and to complete their revisions outside class before submitting their final (third) drafts.

The same procedures were followed for the remaining three writing tasks, with the exception that the briefing sessions were not repeated. A comprehensive overview of the entire process is provided in Figure 1. In the final class, the Likert-scale questionnaire was administered to assess the perceived usefulness and ease of use of the integrated feedback types the students had received.

Due to the heavy exam schedules after the conclusion of the course, semi-structured one-on-one online interviews were conducted four weeks later with 12 randomly selected students (six from each group) to collect qualitative data. To facilitate recall during the interviews, each participant's written drafts were displayed on screen at the beginning of each session. The researcher reviewed the participants' writing tasks and guided them through the entire revision process. Participants were informed that they could interview in their first language and were encouraged to ask questions or request to revisit specific drafts they wished to discuss. Each interview lasted approximately 20 to 45 minutes.

Figure 1

The Revision Procedure

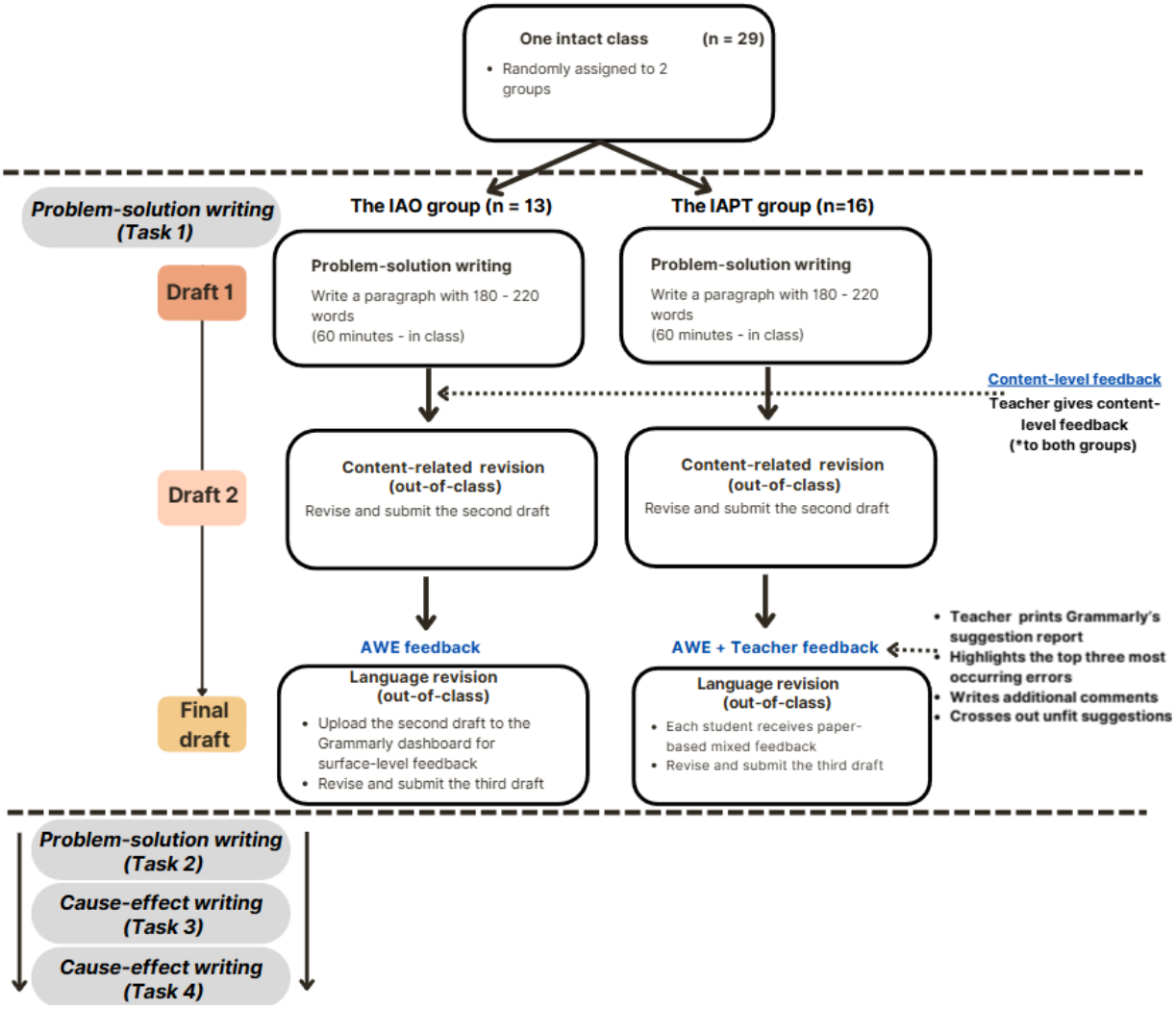
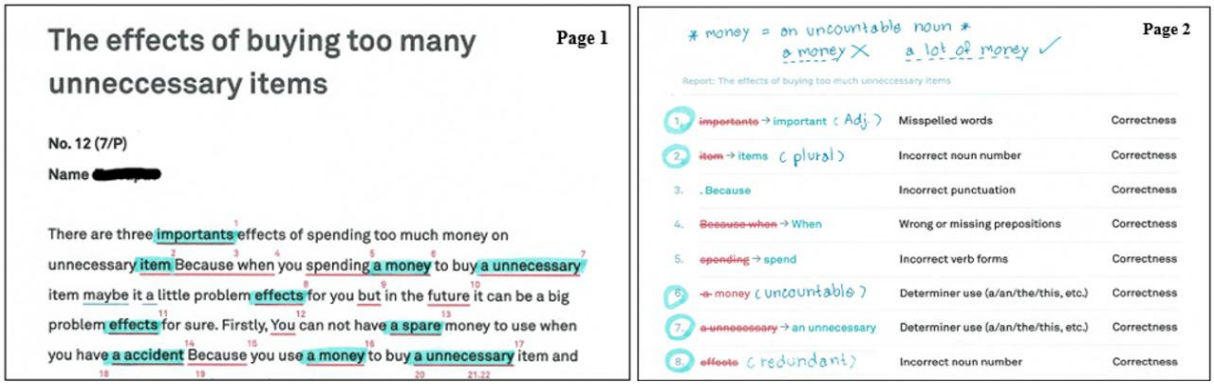


Figure 2

Grammatical Report with AWE plus Teacher Feedback Provided to the IAPT Group



The effects of buying too many unneccessary items

Page 1

No. 12 (7/P)

Name [redacted]

There are three importants effects of spending too much money on unnecessary item Because when you spending a money to buy a unnecessary item maybe it a little problem effects for you but in the future it can be a big problem effects for sure. Firstly, You can not have a spare money to use when you have a accident Because you use a money to buy a unnecessary item and

Page 2

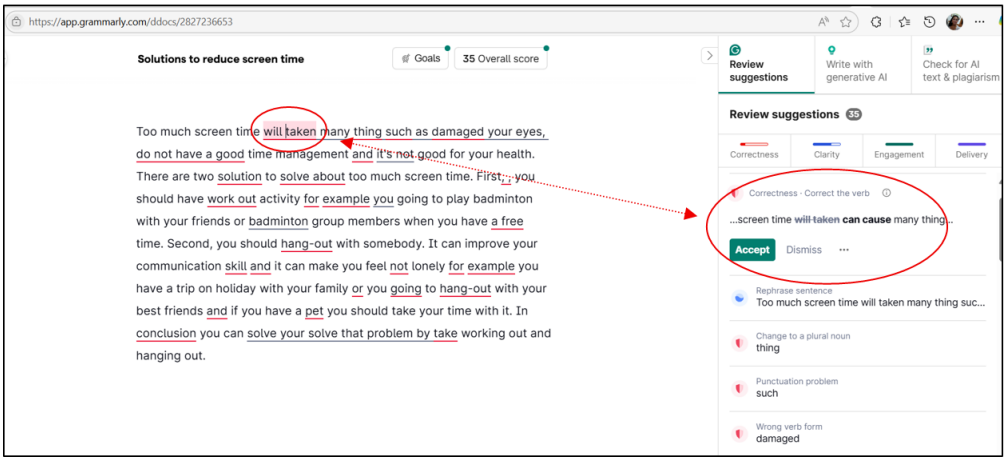
* money = an uncountable noun *
a money ✗ a lot of money ✓

Report: The effects of buying too much unneccessary items

1. ~~importants~~ → important (Adj)	Misspelled words	Correctness
2. ~~item~~ → items (plural)	Incorrect noun number	Correctness
3. . Because	Incorrect punctuation	Correctness
4. ~~Because when~~ → When	Wrong or missing prepositions	Correctness
5. ~~spending~~ → spend	Incorrect verb forms	Correctness
6. ~~a~~ money (uncountable)	Determiner use (a/an/the/this, etc.)	Correctness
7. ~~a unnecessary~~ → an unnecessary	Determiner use (a/an/the/this, etc.)	Correctness
8. ~~effects~~ (redundant)	Incorrect noun number	Correctness

Figure 3

AWE Feedback Generated by Grammarly for the IAO Group



Data Collection

This study received approval from the Institutional Review Board (IRB) under the Office of the Research Ethics Review Committee for Research Involving Human Subjects. Prior to the experiment, students were asked to sign consent forms and were informed of their right to withdraw from the study at any time. They were also assured that all information collected would remain confidential and that pseudonyms would be used in all data reporting.

Following the experiment, the questionnaire was administered to all participants during the final class session. Four weeks later, six students from the IAO group and six from the IAPT group were randomly selected to participate in one-on-one online interviews.

Data Analysis

To examine the perceived usefulness and ease of use of IAO and IAPT feedback of the students, both quantitative and qualitative data were analyzed. Quantitative data from the five-point Likert-scale questionnaire was analyzed using the Mann–Whitney U test to determine whether statistically significant differences ($p < .05$) existed between the two groups. Qualitative data was obtained from semi-structured interviews, which were professionally transcribed and analyzed to gain deeper insights into students' perceptions of the two types of integrated feedback.

To ensure the accuracy and interpretation of the data, triangulation and member-checking strategies were employed. The qualitative results from the interview transcripts were compared with the quantitative findings from the questionnaire (Creswell, 2007; Krippendorff, 2019). In addition, two participants - one from the IAO group and one from the IAPT group - voluntarily participated in a member-checking session conducted via an online interview. During the session, the researcher presented the study's findings and conclusions in the participants' native language and asked them to verify the accuracy of the interpretations.

Research Findings

Quantitative Findings

The normality of the questionnaire score distribution was examined using the Shapiro–Wilk test. The results indicated a rejection of the null hypothesis ($p < .05$), suggesting that the data were not normally distributed. Consequently, non-parametric tests were employed for the data analysis, as summarized in Table 2.

Table 2

Mann–Whitney U Results Comparing Students' Acceptance of Received Feedback Between IAO and IAPT Groups

Measure	Group	*n*	*Mdn*	*IQR*	*Mean Rank*	*Sum of Ranks*	*U*	*p*
Overall Feedback	IAPT	16	5.00	0.33	17.69	283.00	61.00	0.044*
	IAO	13	4.33	1.00	11.69	152.00		
Perceived Usefulness	IAPT	16	5.00	0.00	17.38	278.00	66.00	0.045*
	IAO	13	4.00	1.00	12.08	157.00		
Perceived Ease of Use	IAPT	16	5.00	0.50	17.34	277.50	66.50	0.069

Measure	Group	*n*	*Mdn*	*IQR*	*Mean Rank*	*Sum of Ranks*	*U*	*p*
	IAO	13	4.50	1.00	12.12	157.50		
Content-Level Feedback	IAPT	16	4.70	0.60	17.09	273.50	70.50	0.135
	IAO	13	4.40	0.70	12.42	161.50		
Perceived Usefulness	IAPT	16	4.67	0.33	17.47	279.50	64.50	0.072
	IAO	13	4.00	0.83	11.96	155.50		
Perceived Ease of Use	IAPT	16	4.75	1.00	15.22	243.50	100.50	0.869
	IAO	13	4.50	1.00	14.73	191.50		
Surface-Level Feedback	IAPT	16	4.88	0.75	17.88	286.00	58.00	0.038*
	IAO	13	4.00	0.63	11.46	149.00		
Perceived Usefulness	IAPT	16	4.75	0.50	18.38	294.00	50.00	0.014*
	IAO	13	4.00	0.75	10.85	141.00		
Perceived Ease of Use	IAPT	16	5.00	1.00	16.81	269.00	75.00	0.179
	IAO	13	4.50	0.75	12.77	166.00		

Note. IAO = [Integrated AWE-only]; IAPT = [Integrated AWE-plus-Teacher]. $p < .05$.

For overall integrated feedback, results from the Mann–Whitney U test showed that students who received the IAPT feedback (*Mdn* = 5.00, mean rank = 17.69) expressed significantly higher levels of acceptance than students who received the IAO feedback (*Mdn* = 4.33, mean rank = 11.69), $U = 61.00$, $p = .044$. Similarly, students who received the IAPT feedback (*Mdn* = 5.00, mean rank = 17.38) rated overall perceived usefulness significantly higher than students who received the IAO feedback (*Mdn* = 4.00, mean rank = 12.08), $U = 66.00$, $p = .045$. However, no significant difference was found in overall perceived ease of use between students who received the IAPT feedback (*Mdn* = 5.00, mean rank = 17.34) and those who received the IAO feedback (*Mdn* = 4.50, mean rank = 12.12), $U = 66.50$, $p = .069$.

At the content level, no significant differences were observed between the groups. The Mann-Whiney U test indicated no significant difference in acceptance of content-level feedback between IAPT students (*Mdn* = 4.70, mean rank = 17.09) and those in the IAO group (*Mdn* = 4.40, mean rank = 12.42), $U = 70.50$, $p = .135$. Consistent results were also found for perceived usefulness and perceived ease of use. No significant differences were found in the perceived usefulness of IAPT students (*Mdn* = 4.67, mean rank = 17.47) and the IAO group (*Mdn* = 4.00, mean rank = 11.96), $U = 64.50$, $p = .072$. Similarly, there were no significant differences in the perceived ease of use of content-level feedback among IAPT students (*Mdn*

= 4.75, mean rank = 15.22) and IAO students (*Mdn* = 4.50, mean rank = 14.73), *U* = 100.50, *p* = .869.

By contrast, significant differences emerged in relation to surface-level feedback. The IAPT students (*Mdn* = 4.88, mean rank = 17.88) expressed significantly higher levels of acceptance than IAO students (*Mdn* = 4.00, mean rank = 11.46), *U* = 58.00, *p* = .038. Concordantly, IAPT students (*Mdn* = 4.75, mean rank = 18.38) reported significantly higher levels of perceived usefulness of surface-level feedback compared to IAO students (*Mdn* = 4.00, mean rank = 10.85), *U* = 50.00, *p* = .014. Nevertheless, no significant difference was found in perceived ease of use between the IAPT group (*Mdn* = 5.0, mean rank = 16.81) and those in the IAO group (*Mdn* = 4.50, mean rank = 12.77), *U* = 75.00, *p* = .179.

Qualitative Findings

The interview findings provided more profound insights into the perceptions of the usefulness and ease of use of the IAO and IAPT feedback of the students, as outlined below.

1) Perceived Usefulness

The interviews revealed that participants in both IAO and IAPT groups expressed that the two types of integrated feedback enabled them to focus on revising one aspect at a time - content in the first revision and language in the second. Furthermore, the separation of content-level and surface-level feedback was regarded by some students as a clear reminder of the types of mistakes they had made and the types of corrections they needed to address.

With regard to content-level feedback, however, its usefulness was perceived differently across participants. These differences were not determined by the type of integrated feedback received (IAO or IAPT). Students who made only a few content-related mistakes, and therefore received minimal feedback from the teacher, considered the content-level feedback less useful for revisions than those who received more extensive feedback. The following excerpt illustrates one student's perspective on the perceived usefulness of content-level feedback in revising his paragraphs, which contained only a few content-level mistakes.

> IAO6: "I always tried to make sure that the content and organization were appropriate from the first draft. Therefore, I did not receive much content-level feedback for the revision. ...So, I did not learn much from it..."

In terms of the perceived usefulness of surface-level feedback, some IAO students reported that Grammarly occasionally lacked accuracy in detecting errors or providing suggestions, which required them to rely on their own judgment. For example, one IAO student stated:

> IAO5: "I was satisfied with using Grammarly. … (However,) there was one time when it (Grammarly) did not catch the wrong spelling for me. I found the mistake and had to correct it myself."

While IAO students, who received surface-level feedback solely from Grammarly, occasionally expressed concerns about its accuracy, IAPT students, who received mixed surface-level feedback from Grammarly and the teacher, did not report such issues. These insights provide further support for the quantitative findings from the questionnaire, which indicated that the IAPT group reported significantly higher levels of perceived usefulness for surface-level feedback compared to the IAO group.

2) Perceived Ease of Use

The interviews revealed varied student perceptions of the ease of use of IAO and IAPT feedback. While both groups generally found the separation of content-level and surface-level feedback easy to use, some initially perceived it as slightly complicated when working on the first task. In addition, some students suggested that the ease of use of integrated feedback (both IAO and IAPT) could be enhanced by providing content-level and surface-level feedback simultaneously, allowing them to complete all revisions at once. Excerpts illustrating these perspectives are presented below.

> IAPT6: "…when I started revising for the first time, I was a bit confused. However, once I was familiar with the process (of implementing the integrated feedback), the revision was easy."
>
> IAO4: "I made just a few content-level changes in the first drafts. … So, I think it would be more convenient if the content-level feedback were combined with the surface-level feedback … put in the same draft."

In terms of content-level feedback, the interview results showed that students in both the IAO and IAPT groups generally perceived it as easy to use. However, some students, regardless of group, noted that incorporating the teacher's content-level feedback during revisions was sometimes challenging. One student explained:

IAO3: “I felt that making content-level revision was harder than the surface-level revision. Though the teacher provided (content-level) feedback, I sometimes did not know what to write based on it. I had to think a lot. ...the surface-level revision was much easier ...”

For the perceived ease of use of surface-level feedback, some IAO students expressed difficulties in understanding certain Grammarly suggestions. They noted that the automated feedback sometimes lacked comprehensibility and expressed a need for additional teacher support. One IAO participant commented:

IAO5: “... I feel that students who are good at English may easily understand Grammarly’s suggestions, but for someone like me, who is not very good at English, the suggestions are sometimes hard to fully understand - and that sometimes became a problem when I made revisions. ... I believe that if I had received additional explanations from the teacher, I would have understood some (automated) suggestions better.”

The concerns raised by an IAO student regarding the comprehensibility of Grammarly’s surface-level feedback stand in contrast to the perspectives of students in the IAPT group, who received mixed feedback from both Grammarly and the teacher. The following excerpts illustrate two IAPT students’ positive views of the mixed surface-level feedback they received:

IAPT1: “I think the best part of it (the surface-level feedback) was the additional comments from the teacher. They were really useful because they helped me understand why I needed to make certain edits. The feedback not only helped me correct my mistakes - it also helped me understand them more clearly.”

IAPT6: “The (surface-level) feedback provided clear guidelines. It told me clearly why it was wrong. I think it was especially suitable for beginners like me who are not good at vocabulary and grammar. I think it is easier to understand (compared to the automated feedback alone). ... In particular, when the teacher included some explanations in Thai, I felt even more motivated to revise because those comments were much easier to understand.”

Another issue concerning the perceived ease of use of surface-level feedback was reported by students in the IAPT group, who noted minor challenges when using the grammatical report (see Figure 2). In contrast, students in the IAO group did not report any difficulties using Grammarly's dashboard (see Figure 3). An excerpt from an IAPT student is presented below:

> IAPT5: "The grammar report helped me a lot with language revision. ...(but) It took a little effort to match the suggestions with the incorrect words for editing ..."

The excerpts above provide deeper insights into students' perceptions of the ease of use of surface-level feedback. Although both the IAO and IAPT groups generally considered the feedback easy to use, some challenges were noted. Students in the IAO group, who received surface-level feedback generated by Grammarly, reported that the automated suggestions occasionally lacked comprehensibility, indicating a need for additional teacher support. By contrast, students in the IAPT group did not experience difficulties with comprehensibility but noted minor challenges in navigating the grammatical report (see Figure 2). These issues are further discussed in the Discussion section.

Discussion

The objectives of this study were to examine the perceived usefulness and perceived ease of use of two types of integrated feedback of the students: Integrated Automated-Only (IAO) and Integrated Automated-Plus-Teacher (IAPT) feedback. The findings revealed that students in the IAPT group reported significantly higher levels of perceived usefulness than those in the IAO group, while no significant differences were observed between the groups in terms of perceived ease of use. When the two subtypes of feedback - content-level and surface-level - were analyzed separately, significant differences appeared only for surface-level feedback. The IAPT group, which received surface-level feedback from both Grammarly and the teacher, demonstrated significantly higher levels of perceived usefulness than the IAO group, which received surface-level feedback from Grammarly alone. Nonetheless, no significant differences were found between the groups regarding the perceived ease of use of surface-level feedback.

Overall, students' perceptions of integrated feedback (IAO and IAPT) aligned with their perceptions of the surface-level feedback they received. The findings indicated that students perceived IAPT feedback as more useful than IAO feedback and rated surface-level feedback

from both Grammarly and the teacher (in IAPT) as more useful than surface-level feedback provided by Grammarly alone (in IAO). Thus, students' overall perceptions may largely be attributed to the differences observed in surface-level feedback.

The interview findings suggest that one possible reason students rated the mixed surface-level feedback from both Grammarly and the teacher as more useful than Grammarly feedback alone was the occasional inaccuracy of Grammarly's feedback. Previous studies (e.g., Barrot, 2022; Huawei & Aryadoust, 2023; Ranalli & Yamashita, 2022) have similarly reported instances of inaccurate feedback generated by Grammarly. Although Grammarly has been shown to achieve over 80% accuracy, erroneous suggestions and undetected errors still occur (Barrot, 2022; Ranalli & Yamashita, 2022). As a result, students who received surface-level feedback solely from Grammarly expressed occasional challenges, whereas those who received feedback from both Grammarly and the teacher did not report such issues, as the teacher verified the accuracy of the automated feedback before distributing the feedback report.

Although the quantitative results did not show significant differences between the IAO and IAPT groups in perceived ease of use of the feedback received, the qualitative data provided additional insights into students' perceptions. Students in the IAPT group, who received mixed surface-level feedback from both Grammarly and the teacher, noted minor challenges in using the grammatical report for revisions (see Figure 2) but generally regarded the feedback as clear and comprehensible. In contrast, students in the IAO group, who received surface-level feedback from Grammarly, reported no difficulties using the Grammarly dashboard (see Figure 3) but, at times, found the automated feedback difficult to interpret and expressed a need for additional teacher support.

The IAO group's need for additional teacher support is consistent with the findings of Chen and Cheng (2008), who observed that students preferred receiving supplementary teacher feedback alongside AWE feedback, as teacher input can provide personalized comments that extend beyond the capabilities of AWE systems. Surface-level feedback generated by an AWE system alone may not always match the learner's current proficiency level. As a result, similar to the findings of Koltovskaia (2020), the IAO students in this study who relied solely on AWE feedback for surface-level revisions encountered occasional difficulties in understanding the feedback, particularly those who perceived themselves as less proficient in English. Theoretically, this phenomenon can also be explained through the lens

of formative assessment theory (Hattie & Timperley, 2007), as feedback that does not align with a student's current proficiency level may not always be comprehensible.

Another point raised concerned the perceived usefulness and ease of use of the two subsets of feedback - content-level and surface-level - in both the IAO and IAPT groups. Many students valued receiving two separate rounds of feedback (three-draft revision), noting that it allowed them to focus on one aspect at a time. However, some students expressed a preference for receiving both types of feedback simultaneously (two-draft revision), particularly those who considered themselves proficient writers. In addition to the convenience noted by students, this preference may also stem from their confidence in managing multiple types of feedback simultaneously. This observation is consistent with Bitchener and Ferris (2012) and Mao and Lee (2020), who argue that higher-proficiency students can manage a greater cognitive load when processing feedback, whereas lower-proficiency students may need to focus on one feedback category at a time. An implication of this finding is that teachers might consider providing both types of feedback simultaneously when students demonstrate the capacity to manage content-level and surface-level feedback together.

Additionally, although the same teacher provided content-level feedback using identical guidelines for both the IAO and IAPT groups, the interviews revealed differing perceptions among students across the groups. Some students, particularly those who considered themselves proficient writers, reported that the content-level feedback was easy to use, while some reported that it was more challenging to apply than the surface-level feedback. For instance, one student remarked that, despite understanding the teacher's comment, he did not know what to write. This reflects Goldstein's notion (2006) that a gap may arise between the teacher's intention and students' implementation of feedback when students lack the skills to apply it effectively or when feedback is insufficiently explicit in directing them on how to proceed. In line with Li (2009), this suggests that even when following the same feedback guidelines, teachers may need to provide lower-proficiency students with more explicit feedback (eg., giving additional examples) than higher-proficiency students, who can more readily incorporate the input provided.

Limitations of the Study

Three limitations should be acknowledged. First, although the participants were from the same major, studied in the same class, and had approximately intermediate English proficiency, the written paragraphs collected in this study reflected some differences in their individual writing skills. For instance, some students required only minimal content-level improvement and therefore received fewer content-level suggestions compared to peers who needed more extensive revisions. This variation may have influenced their perceptions of the feedback's usefulness and ease of use. Second, due to time constraints, both the IAO and IAPT groups received a brief 10-minute training on how to apply the feedback in their revisions. This may have influenced students' perceptions, as a few reported experiencing slight confusion when revising their first writing task. Third, although all tools were developed and refined through two phases - tryout and pilot - before implementation in the main study, students reported slightly different experiences with the feedback tools: some IAPT students mentioned minor issues with the usability of the grammatical report (see Figure 2), while IAO students noted that the Grammarly dashboard was easy to use (see Figure 3). This factor may therefore have influenced students' perceptions of ease of use differently across the two groups.

Conclusion

This study found that students perceived IAPT feedback as more useful than IAO feedback, particularly with regard to surface-level feedback. The mixed surface-level feedback from both the AWE system and the teacher was perceived as more useful than AWE feedback alone. These findings contrast with those of Ghufron and Rosyida (2018), who suggested that AWE feedback can be used to address surface-level issues and enable the teacher to focus on content-level feedback. Instead, the present study shows that EFL students valued teacher input to supplement AWE-generated surface-level feedback, as the combination enhanced both accuracy and comprehensibility of the feedback.

Extending prior research that has primarily examined the limitations of AWE systems in terms of inaccurate or undetected feedback (e.g., Barrot, 2022; Ranalli & Yamashita, 2022), the current study reveals that students may experience challenges with AWE beyond accuracy. In particular, students who perceived themselves as less proficient reported difficulties in understanding automated feedback, as such feedback may not always align with their proficiency level. Therefore, having the teacher review automated feedback for accuracy and

supplement it with input tailored to each student's proficiency level may help improve both the accuracy and comprehensibility of the feedback.

Additionally, two other key points were identified in this study. First, some students preferred receiving both content-level and surface-level feedback simultaneously rather than separately, particularly those who considered themselves proficient writers. This suggests that teachers may choose to combine or separate content-level and surface-level feedback depending on students' ability to manage feedback. Both approaches are feasible, as shown in Ashwell's (2000) study, which compared simultaneous and separated feedback and found no significant differences in content or language score gains between the first and final drafts. Second, some students indicated a need for more explicit content-level feedback, especially those with lower proficiency. They may need more concise samples, such as complete sentences that can be directly applied.

To conclude, although AWE feedback tools such as Grammarly have achieved over 80% accuracy in identifying and suggesting surface-level corrections (Koltovskaia, 2020), the findings highlight that teacher involvement is essential for both surface-level and content-level feedback. As one student observed:

> "...I am really satisfied with the additional comments from the teacher (alongside the automated feedback) ...these helped me better understand my mistakes and made the revision process easier."

Recommendations for Future Research

Three recommendations for future research emerge from the findings and limitations of this study. First, researchers may consider allocating more time to training, particularly in relation to the revision process and the implementation of each type of feedback. In addition, participants using AWE feedback should be made aware of the system's limitations and be provided with strategies to address them. Second, as the results indicated that students with different proficiency levels may perceive the usefulness and ease of use of feedback differently, future studies could include groups of learners with varying proficiency levels to allow for more nuanced comparisons. Third, since some participants in this study reported minor challenges with the usability of the grammatical report (see Figure 2), future research may focus on developing feedback tools that integrate surface-level feedback from an AWE system with teacher input to better support students' revision.

The Authors

Nattapat-orn Chuleethongrerk holds a PhD from the English as an International Language (EIL) program at the Graduate School, Chulalongkorn University. With diverse experience in teaching English courses across academic settings, her professional background focuses on language instruction and curriculum development.

Jirada Wudthayagorn is an Associate Professor in English Language Teaching at Chulalongkorn University. Her research interests include Language assessment, language policy, and quantitative research. She has published widely in national and international journals and has supervised numerous graduate research projects.

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AI Declaration Statement

During the preparation of this work the authors used Grammarly and ChatGPT in order to refine the language. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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