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EAP teacher feedback in the age of AI: Supporting first-year students in EFL disciplinary writing

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Abstract

Academic writing is a substantial component of tertiary education, yet it poses challenges for second/foreign language students, particularly first-year undergraduates with limited pre-university exposure to English-medium instruction (EMI) settings. In this context, English for academic purposes (EAP) teachers play a crucial role in supporting these students, but little is known regarding the nature of their feedback in scholarly literature. Complicating matters further is the emergence of generative artificial intelligence (GenAI) as a feedback tool, sparking ongoing debate about its efficacy in comparison with that of traditional human feedback. To address these gaps, this study investigated the nature of EAP teacher feedback on English as a foreign language (EFL) disciplinary writing, juxtaposing it against students' perceptions of both EAP teacher feedback and AI-generated feedback. This study employed a three-layer coding scheme focusing on corrective, genre-specific, and intentional feedback to analyse the nature of EAP teacher feedback in detail. Through a comprehensive analysis of the interview themes, this study highlights the significance of EAP teacher feedback in the context of increasing integration of GenAI tools. The findings offer valuable insights into effective practices for supporting first-year EFL undergraduate students in their discipline-specific academic writing within EMI settings and demonstrate the critical role of EAP teacher feedback in assisting these students' writing in an AI-prevalent world.

Keywords: teacher feedback; EAP teachers; EFL students; disciplinary writing; GenAI feedback; students' perceptions

Introduction

Academic writing constitutes a significant component of university life for tertiary students (Evans & Green, 2007). At English-medium instruction (EMI) universities, the primary objective of academic English writing is to effectively convey subject knowledge and formulate disciplinary arguments in English (Hyland, 2013). However, previous research has indicated that many tertiary English as a foreign language (EFL) students at EMI universities, particularly first-year EFL undergraduates, encounter challenges in adapting to academic English writing conventions, organising disciplinary essays, and constructing academic arguments using discipline-specific academic English (Evans & Green, 2007; Yung & Fong, 2019).

The difficulty that many first-year EFL undergraduates at EMI universities face in completing their discipline-specific written assignments satisfactorily can be attributed to two main factors. Firstly, their limited pre-university exposure to English for academic purposes (EAP) training hinders their ability to quickly adapt to academic English writing conventions. English language education in secondary schools in EFL contexts (e.g., China) typically emphasises everyday English rather than academic English (Lo & Lin, 2019). As a result, first-year EFL undergraduates who meet the English language entry requirements of EMI universities often lack proficiency in discipline-specific academic English writing (Yung & Cai, 2020). Secondly, the compulsory EAP courses provided for first-year undergraduates are usually domain-general, teaching common EAP writing conventions to students from various academic disciplines (Hill et al., 2020). This makes it challenging for first-year EFL undergraduates to apply the domain-general EAP course content to their discipline-specific assignments (Wubalem, 2021). The necessity to master discipline-specific academic English writing skills imposes an additional burden on these students, underscoring the importance of targeted support and effective feedback.

Given that subject teachers typically focus on delivering content knowledge without teaching academic English to students (Lo & Lin, 2019), feedback from EAP teachers on disciplinary writing is crucial for these first-year EFL undergraduates. To date, existing studies have examined two types of EAP teacher feedback on tertiary students' writing: (1) feedback on the students' final submissions in EAP writing courses (e.g., Ma, 2018), and (2) feedback on postgraduate students' manuscripts for publication (e.g., Li & Flowerdew, 2007) or on final-year students' dissertations/theses (e.g., Cui et al., 2023). However, there is limited research on EAP teacher feedback on first-year EFL undergraduate students' interim drafts of disciplinary assignments. Compared with final-year undergraduates and postgraduate student researchers, they have much less experience in discipline-specific writing. Therefore, further research is needed to explore the features of EAP teacher feedback on these first-year undergraduates' disciplinary writing. This study could provide evidence of how EAP teacher feedback on subject-related course assignments can facilitate the transfer of EAP learning to other subject courses and help newly admitted undergraduates adapt to the writing conventions at EMI universities.

Recently, in the context of generative artificial intelligence (GenAI)-enhanced higher education, an increasing number of empirical studies have demonstrated the positive roles of artificial intelligence (AI)-generated feedback in supporting tertiary students' EAP writing (e.g., Banihashem et al., 2024; Nazari et al., 2021). These studies provide two types of evidence regarding the effectiveness of GenAI in writing instruction: (1) improvements in students' writing performance following AI-based instructional interventions (e.g., Nazari et al., 2021), and (2) students' perceptions of the usefulness of AI-generated feedback in enhancing their writing (e.g., Escalante et al., 2023). However, the efficacy of GenAI tools in writing instruction does not necessarily mean that they can completely replace EAP teachers in providing effective

feedback, especially on discipline-specific writing that requires subject knowledge and advanced academic language skills (Qiu et al., 2022). Therefore, further research attention is needed to explore whether tertiary-level student writers believe that AI-generated feedback surpasses EAP teacher feedback in improving their discipline-specific writing performance.

To examine whether AI-generated feedback is more supportive than EAP teacher feedback, this study aimed to explore students' perceptions of EAP teacher feedback within AI-integrated educational contexts. As users of various AI tools in the market, students may hold different attitudes towards EAP teacher feedback and AI-generated feedback, which can provide valuable insights into the significant role that EAP teacher feedback plays in improving EFL undergraduates' disciplinary writing in this context. Ultimately, this research will shed light on the comparative effectiveness of both types of feedback in enhancing students' disciplinary writing skills from the students' perspective.

To address the abovementioned research gaps, this study aimed to address the following research questions:

(1) What is the nature of EAP teacher feedback on EFL disciplinary writing?
(2) In AI-integrated educational settings, how do first-year EFL undergraduate students perceive EAP teacher feedback and AI-generated feedback on EFL disciplinary writing?

Literature Review

Theoretical Underpinnings of Feedback on Second/Foreign Language Disciplinary Writing

Feedback is a fundamental aspect of the learning process (Hyland & Hyland, 2006; Lee, 2017). By definition, it refers to "information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding" (Hattie & Timperley, 2007, p. 81). Effective feedback serves as a catalyst for students' growth, offering valuable insights into strengths and areas for improvement (Brown & Glover, 2006).

One of the most common feedback practices in educational settings is feedback on writing. Feedback on writing is a socially mediated practice (Lee, 2017). Sociocultural theories (Swain et al., 2010; Vygotsky, 1978) highlight the importance of enhancing individuals' learning abilities through mediation, which, in this context, refers to the process by which students engage in learning activities using "culturally constructed material and/or symbolic means" (Swain et al., 2010, p. 6). Additionally, the theory of mediated learning experience (MLE) (Feuerstein et al., 1979) underscores the significance of human activities as mediators, extending beyond merely symbolic tools and/or material. Feuerstein et al. (1979) proposed that the development of learning is facilitated by achieving the four principles of MLE: intentionality, reciprocity, transcendence, and meaning. MLE has been widely used as a theoretical framework in existing research into feedback on writing (e.g., Jiang et al., 2020; Lee, 2017). Specifically, effective feedback on writing should adhere to the following criteria (Lee, 2017): (1) it must have a clear focus (intentionality); (2) there should be interactive engagement between the feedback givers and receivers (reciprocity); (3) it should help writers enhance their performance in subsequent tasks or drafts (transcendence); and (4) the writers' strengths and weaknesses should be clearly identified from the feedback (meaning). Therefore, effective feedback on writing functions as a mediational means for improving writing competence (Lee, 2017).

When producing written discourse, writers need to have an awareness of a genre, which is defined as "a class of communicative events, the members of which share some set of communicative purposes" (Swales, 1990, p. 58). Given the diverse genres of written discourse

(Gardner & Nesi, 2013; Parkinson, 2017), feedback on writing necessitates a genre-focused approach (Uzun & Topkaya, 2020; Yu, 2021). In this sense, providing feedback for disciplinary assignments written by tertiary second/foreign language (L2/FL) students can be a complex issue. Writers need to consider multiple factors, including language, organisation, discipline-specific knowledge, and adherence to academic writing conventions (Li & Han, 2022). Considering that many feedback-related studies have examined features of teacher feedback on L2/FL non-subject general writing (Zhang & Cheng, 2021), this study aimed to explore the nature of teacher feedback on L2/FL disciplinary writing, which is operationalised as EAP teachers' practices of giving feedback on first-year EFL undergraduates' disciplinary writing.

Studies on Teacher Feedback on Writing

There are multiple sources of feedback in educational settings, with teacher feedback frequently regarded as the primary source (Lee, 2017). This section reviews two key strands of research related to teacher feedback on writing: (1) the features of teacher feedback on writing, and (2) learners' perceptions of teacher feedback on their writing.

Features of Teacher Feedback on Writing

For decades, there have been numerous studies on the features of teacher feedback on written discourse (e.g., Lee, 2008a, 2008b; Ma, 2018; Shrestha, 2022). One of the pioneering studies is Mirador's (2000) analysis of moves, which are defined as "the logical manoeuvre adopted by the communicator/s in written or spoken discourse" (p. 47). Mirador suggested that feedback practices typically involve identifying students' advantages and limitations for their further development.

Brown and Glover (2006) developed a coding scheme for written feedback that categorises feedback into five types: content, skills, further learning, motivational comments, and demotivational comments. However, Brown and Glover's coding scheme was designed for both first language (L1) and L2 speakers of English. Given that L2/FL learners often require more language-related feedback, teachers may need to adapt their feedback strategies accordingly. To address this need, Ellis (2009) proposed a framework of written corrective feedback (CF) on L2/FL writing, consisting of: (1) direct versus indirect CF, (2) metalinguistic CF, and (3) unfocused versus focused CF. By differentiating the types of feedback, Ellis's framework aims to help writing instructors provide more tailored feedback for L2/FL students, addressing their unique linguistic challenges.

Despite the differences in their coding schemes, these studies have revealed that, feedback on writing can be classified according to four major principles (e.g., Ellis, 2009): (1) whether it is direct or indirect; (2) whether it is language-, organisation-, or content-related; (3) whether it is deep or superficial; and (4) whether it is motivational or demotivational. However, given the importance of genres in writing, teachers' feedback must also incorporate genre-specific information (Li & Han, 2022; Uzun & Topkaya, 2020; Yu, 2021). This focus ensures that feedback takes the specific conventions and expectations of different types of writing into account.

Research interest in the features of EAP teacher feedback on different genres of writing, such as argumentative writing, has been growing. For example, Ma (2018) examined how two Hong Kong university EAP instructors gave rubric-based feedback on the students' final submissions of their informative and argumentative essays. Ma found that their feedback practices focused more on surface-level writing issues (e.g., language, referencing) than content-level issues. However, Ma's study focused only on feedback given on finalised texts rather than on interim drafts. Consequently, the students' motivation to further improve their writing according to the

teachers' feedback may have been lower than expected, since they had no opportunity to revise their final submissions.

In addition to EAP teacher feedback on informative and argumentative writing, there has been a growing body of research on other types of discipline-specific writing (e.g., research papers). For example, Shrestha (2022) analysed the evaluative language in UK EAP tutors' feedback on business major students' summaries and analyses of a case study. More recently, Cui et al. (2023) explored how EAP instructors at a Chinese university provided feedback for postgraduate students' disciplinary research papers. However, neither study paid attention to the feedback given to first-year undergraduate EFL students, who received little or no EMI in secondary schools. These less experienced EFL writers often lack genre awareness of discipline-specific English writing, frequently struggling to follow academic writing conventions and accurately convey subject knowledge in English (Hirvela & Du, 2013). Therefore, EAP teacher feedback may play an important role in helping them perform better at an EMI university.

To address these limitations, this study aimed to explore the nature of an EAP teacher's feedback on interim drafts of a course paper written by first-year Chinese undergraduates at an EMI university. By focusing on interim drafts, this study hopes to provide insights into the formative feedback process that supports students' ongoing development in EAP, particularly for those who had little prior exposure to EMI.

Learners' Perceptions of Teacher Feedback on Writing

The previous sections discussed the existing literature on the features of teacher feedback within various educational settings. However, students' perceptions of teacher feedback would offer a more comprehensive understanding of the role teacher feedback plays in developing students' writing competence.

There are a variety of studies exploring students' perceptions of teacher feedback on writing (e.g., Yu et al., 2021). For example, Lee (2005) conducted questionnaire surveys with more than 300 Hong Kong secondary students. She found that most participants preferred comprehensive error feedback that prevented them from making repeated mistakes. Additionally, direct correction, where teachers correct all the errors themselves, was favoured by most respondents. These results were not surprising, as Lee noted that many secondary students in Hong Kong lack sufficient English language skills to independently correct their mistakes. Therefore, they rely heavily on their instructors to provide direct feedback on their writing.

EFL secondary students typically prioritise linguistic accuracy in their English writing (Chan, 2010), whereas tertiary students are required to focus on the quality of discipline-specific content and adhere to academic writing conventions (Yung & Cai, 2020). Therefore, in addition to research on secondary students, many researchers (e.g., Walker, 2009) have explored how tertiary students perceive teacher feedback on their writing. For example, Li and Curdt-Christiansen (2020) analysed Chinese postgraduate students' affective and cognitive perceptions of teacher feedback in a UK university. Their findings suggested that the teachers' language use may largely influence the students' responses to the feedback and underscored the importance of the tone of the feedback when providing it.

Although teacher feedback is traditionally viewed as the primary source of feedback on writing (Lee, 2017), GenAI tools have increasingly gained prominence in tertiary educational practices in recent years. Therefore, focusing solely on the teachers' feedback practices may not help educators to make informed decisions about how to best integrate various feedback modes to enhance students' writing competence. The subsequent subsection, therefore, reviews existing research on comparing AI-generated feedback with teacher feedback on writing.

Comparative Studies on Teacher Feedback and AI-Generated Feedback on Writing

One strand of research comparing teacher feedback and AI-generated feedback on writing focuses on the differences in their features (e.g., Guo & Wang, 2023). For instance, a recent study by Steiss et al. (2024) found that experienced teachers offered higher-quality feedback on source-based argumentative essays written by basic education students than AI-generated feedback in terms of five areas: "clarity of directions for improvement, accuracy, prioritization of essential features, and use of a supportive tone" (p. 7). Steiss et al. highlighted that although AI-generated feedback has proven useful in enhancing students' writing performance (e.g., Meyer et al., 2024), its limitations, particularly in these areas, cannot be overlooked.

To compare the long-term effects of teacher feedback and AI-generated feedback on students' writing performance, some scholars (e.g., Wang, 2024) have conducted experimental studies. For example, Escalante et al. (2023) conducted a longitudinal study to examine the impact of teacher feedback versus AI-generated feedback on university students' non-discipline-specific writing performance and to investigate their preferences. The results showed no significant differences in the students' post-intervention writing performance, and the students did not display a clear preference for either type of feedback.

Although numerous studies have compared the effectiveness of teacher feedback and AI-generated feedback in supporting the development of writing, most of them have focused on non-discipline-specific writing rather than discipline-specific writing. Furthermore, many were conducted within a positivism framework, utilising an experimental design. There is a lack of research exploring how university students, who frequently use AI tools in their daily learning, perceive the effectiveness of teacher feedback and AI-generated feedback in enhancing their writing. To address this gap, we conducted interviews to investigate how first-year EFL undergraduates perceive these two types of feedback and their preferences.

Methodology

Research Context

This study was conducted at the English Language Centre (ELC) of an EMI university in Hong Kong. As a government-funded degree-granting tertiary institution in Hong Kong, the university is in the range of 50–100 in the Quacquarelli Symonds (QS) World University Rankings. The ELC serves as a vital hub for developing students' English language skills.

The study is part of a larger project named "Technology-enabled English Across the Curriculum (EAC)". Students are provided with access to language resources tailored to specific writing genres (e.g., final reports, lab reports, reflective essays), available via a mobile platform or PDF documents. Additionally, interested students can register for personalised feedback from ELC teachers to enhance their writing.

Participant Demographics

Four participants were recruited in this study. They were first-year international students at the university. All were born in Mainland China and speak Mandarin Chinese as their native language and English as their L2. All students completed their compulsory EAP courses at the ELC during their first semester at the university. Additionally, it was reported by the participants that, before taking part in this study, they had used at least one GenAI tool but had neither received any training or guidance on AI use via the EAC project nor attended any university-level AI training workshops. Their demographic information is presented in Table 1.

The teacher participant, who was responsible for providing feedback on students' writing, is an experienced professional employed full-time by the ELC. Possessing a Master's degree in

Table 1 Participants' demographics.

#	Department	Programme	English proficiency level	Completion of compulsory EAP courses	Previous English learning
1	Applied Physics	Bachelor of Science in Physics with a Secondary Major in Artificial Intelligence and Data Analytics	Chinese Gaokao: English at 138/150	Yes	About 14 years
2	Applied Physics	Bachelor of Science in Physics with a Secondary Major in Artificial Intelligence and Data Analytics	IELTS: 6.5	Yes	About 13 years
3	Electrical and Electronic Engineering	Bachelor of Science in Artificial Intelligence and Information Engineering	Chinese Gaokao: English at 138/150	Yes	About 15 years
4	Applied Mathematics	Bachelor of Science in Mathematics	IELTS: 6.0	Yes	About 8 years

Linguistics from a world-renowned university and boasting over 5 years of teaching experience, the teacher is highly qualified to offer feedback in this study.

Collection Instrument for Teacher Feedback

The dataset came from the teacher's feedback on four individual reflection essays. All feedback items were marked on the essays using the "Comment" function in Microsoft Word (version 16.0, Microsoft Corporation). This function enables viewers to select certain parts of the essay and make a comment directly.

This reflection essay was a written assignment in a first-year general social sciences course at the university. Students were formally instructed to write between 1500 and 1700 words, excluding references. The referencing format recommended was APA (7th edition). The course guide specified that students should write two parts in this essay. Part A should critically discuss the theories and concepts covered in the course. Part B should evaluate the students' strengths and weaknesses in relation to the concepts discussed in Part A. Since this essay was written as part of a course, drawing on specific subject knowledge and adhering to the reflective writing genre, it provided a strong sample for this study's investigation.

The course guide was distributed to students via the learning management system at the onset of the course, and one workshop was conducted outside the regular course sessions to guide students in their writing process. Consequently, students were well-informed about the expectations of this assignment. Similar instructions were also given to the teacher, ensuring that she was well-informed about the assignment requirements.

Data Collection Procedures

The data collection involved four stages. Initially, a registration form was distributed to all students enrolled in this first-year general social sciences course via Microsoft Forms. Students were invited to join our study, with the potential benefits of receiving a professional EAP teacher's feedback on their writing. This communication outlined the requirements of participation: (1) submitting their writing for evaluation at least one week prior to the assignment's submission deadline, and (2) attending a post-course interview at their convenience after the announcement of their final assessment results. To facilitate participation, potential participants were given a designated window to register, with the deadline set two weeks before their assignment's submission deadline. In the end, four students participated, provided their consent, submitted their draft essay, and scheduled an individual interview with the researcher in charge.

The post-course interviews were conducted in a one-on-one format, where a researcher interviewed each student individually. This approach provided an effective platform for the students to discuss their perceptions of their previous engagement with the EAP teacher's feedback and AI-generated feedback. It facilitated a deeper understanding of their opinions and the challenges encountered. Since the writing they submitted was a course assignment, we made sure that the post-course interviews were conducted strictly after their results were released, ensuring that students were not concerned about their responses impacting their assignment's grades.

The interview questions were carefully designed to align with the research aims and objectives, focusing on the participants' perceptions of the EAP teacher's feedback and AI-generated feedback. These questions also prompted students to compare the two types of feedback according to their own academic writing experiences. Each interview consisted of four sections, with a total of 11 questions (see Appendix A). The first section introduced the general purpose of the study and outlined the upcoming procedures. The second section asked students to reflect on and comment specifically on the teacher feedback they received. The third section addressed questions related to GenAI, inviting the participants to share their thoughts on using GenAI tools for feedback. The final stage wrapped up the discussion and provided closure. Each interview lasted approximately 30 minutes and was conducted via Zoom. With the participants' consent, all interviews were recorded for further analysis. To ensure comfort, they were encouraged to use their preferred language. Two participants chose to speak in Mandarin Chinese, whereas the other two opted for English.

Data Analysis Procedures

Analysis of Teacher Feedback via a Feedback Coding Scheme

This study developed a three-layer feedback coding scheme (FCS) (see Appendix B) with reference to previous scholarly works (e.g., Bhatia, 1993; Black & William, 1998; Brown & Glover, 2006). Each layer emphasises different aspects, ranging from broad and surface-level elements, such as feedback that addresses linguistic mistakes, to deeper levels of components, such as intentional feedback that motivates further learning. By employing the three-layer FCS, we intended to create a scaffolding effect that could be innovative and significant in uncovering the major features of the teacher feedback discussed.

First-Layer Coding

The first-layer coding involved coding "direct" and "indirect" feedback, which has been constantly discussed by scholars (Chandler, 2003; Ellis, 2009; Ferris & Roberts, 2001). In the initial phase, we emphasised linguistic errors and areas of improvement (i.e., the CF). Then various types of errors in their writing, such as citation mistakes, were considered. Through them, we identified items that involved direct error correction or simple error identification.

Direct feedback (coded as "DF") involves the teacher providing the correct form to replace the incorrect one (Lalande, 1982; Robb et al., 1986). One example in Figure 1 shows that the teacher directly pointed out the need for a change in punctuation. Optionally, the teacher may provide an explanation or rationale behind the correction to aid students' understanding. Such an example is shown in Figure 2.

Unlike direct feedback, *indirect feedback* (coded as "IDF") entails indicating and locating errors within the students' writing without providing the correction outright (Chandler, 2003; Ellis, 2009). The teacher specified the location of the error within the text to guide the students' attention (see Figure 3).

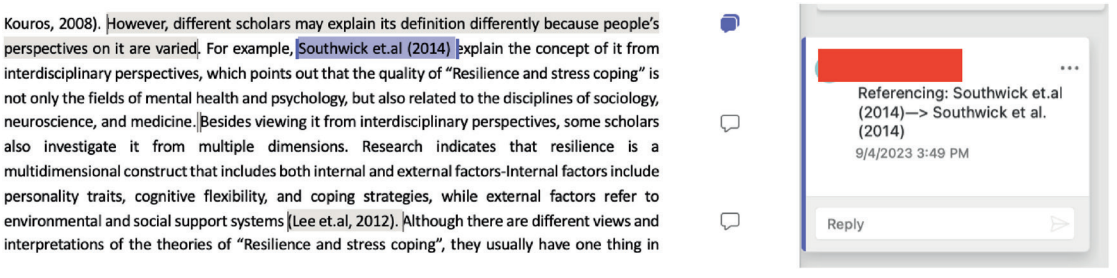

Figure 1 Example of direct feedback.

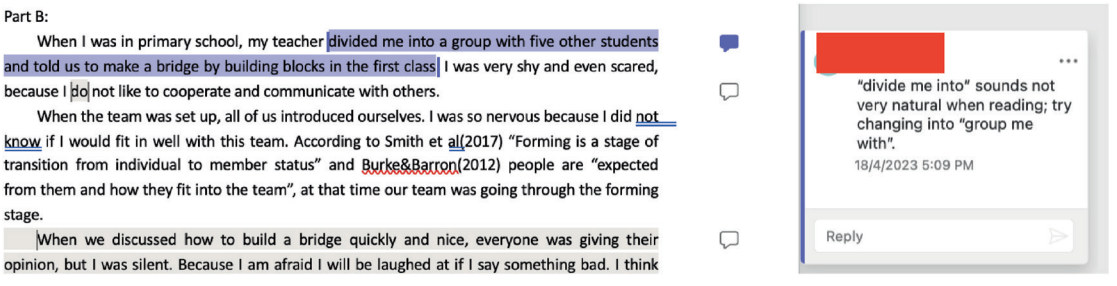

Figure 2 Example of direct feedback including a rationale.

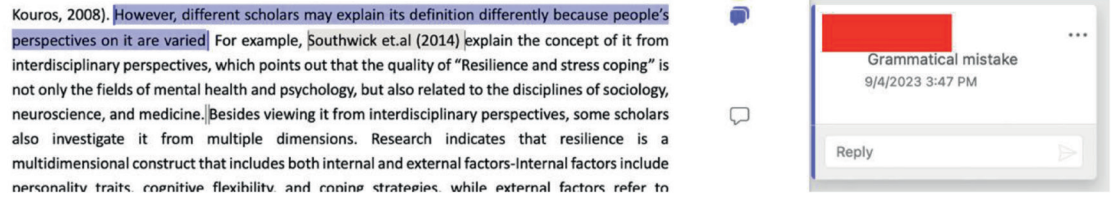

Figure 3 Example of indirect feedback.

Second-Layer Coding

The second layer of FCS concentrated on four components pertinent to the genre of writing: language, academic writing format, structure, and argument. These four components were mainly based on the assessment criteria of the assignment. Three detailed parts were mentioned in the criteria: content, high-level thinking, and the quality of the paper. The content assessment required students to present rich content and give extensive evidence from extra reading. For higher-level thinking, the students should offer an in-depth discussion and reflect on their own experiences with arguments. Finally, regarding the quality of the paper, the students should present a clearly structured flow, achieve high accuracy in their language, and use the correct reference format.

Genre-specific written feedback is mutually understood by members of a community (Swales, 1981, 1990). There should be shared communicative purposes and requirements for the writers to successfully achieve a piece of writing (Bhatia, 1993). In this study, students were provided with guidelines characterising the assignment. Therefore, we began by examining the assessment components that directed the students while writing, which can be summarised as:

- Language use accuracy (coded as "LUA");
- Academic writing format (coded as "AWF");
- Writing structure (coded as "WS");
- Argument validity (coded as "AV").

First and foremost, "language use accuracy" scrutinised the linguistic feedback that looked at the grammar, vocabulary usage, and punctuation of writing. As stated in the assessment criteria, students should achieve clarity in language. A focus on language ensured the standard of the linguistic correctness of the students' writing.

Secondly, we delved into the aspect of the format of academic writing. The teacher offered guidance on adherence to the established standards concerning referencing, quotation, and the list of references to ensure the integrity of the students' academic discourse, which was also part of the assessment criteria.

Structural coding emphasised feedback that addressed the organisation and coherence of the content. The teacher judged whether the students' writing followed a structured approach as favoured by the assessment criteria. An example of such is shown in Figure 4, where the teacher stated that the student should insert a transition paragraph between the two paragraphs selected.

Furthermore, our method included argument-oriented coding, which captured feedback considering the critical arguments made in writing. This emphasis entailed assessing the logical flow of writing to ascertain the students' ability to convey the intended ideas to the readers persuasively. Figure 5 is an example. The teacher indicated that the student's concluding argument was unclear and not valid enough to support his previous arguments.

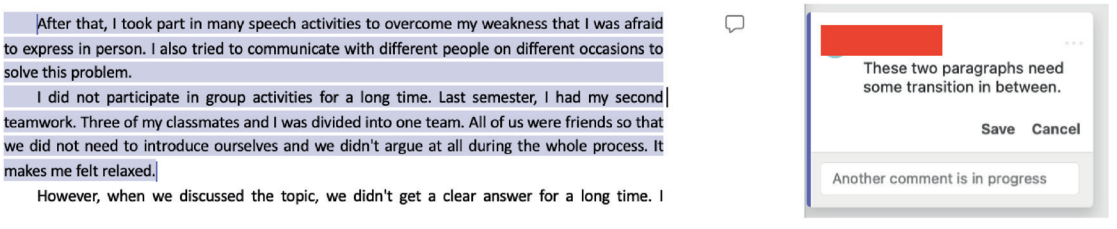

Figure 4 Example of teacher feedback regarding structure.

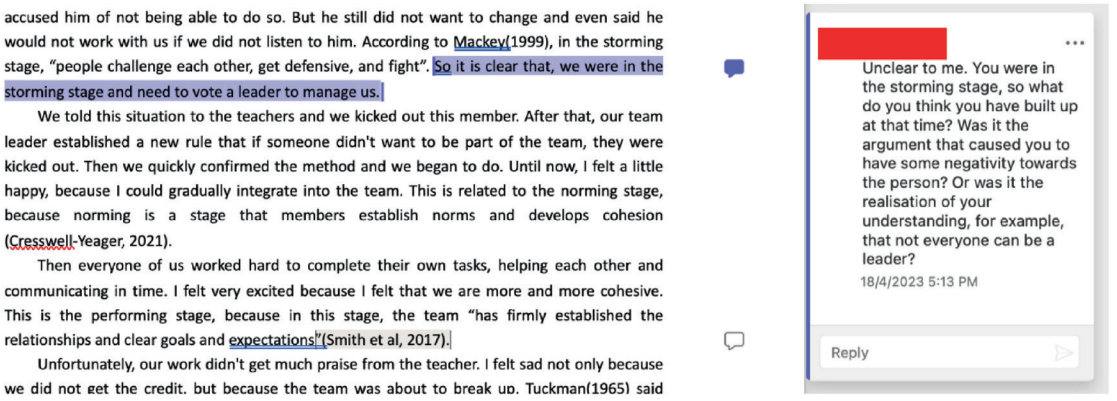

Figure 5 Example of teacher feedback on critical arguments.

Third-Layer Coding

The third-layer coding was used to examine the question of "how", related to the intention of giving feedback. Referring to Brown and Glover (2006), Gibbs et al. (2003), Nicol and Macfarlane-Dick (2004), and Sadler (1989), we came up with a revised version of the conceptual framework. The original framework is as follows:

- *Comments about the content of a student's response: i.e., the student's knowledge and understanding of the topics being assessed (coded as "C").*
- *Comments that help a student to develop appropriate skills (coded as "S").*
- *Comments that actively encourage further learning (coded as "F").*
- *Comments providing a qualitative assessment of a student's performance that are motivational (coded as "M").*
- *Comments providing a qualitative assessment of a student's performance that may de-motivate (coded as "DM").*

(Brown & Glover, 2006, p. 83)

The adjusted and revised framework is presented below:

- Feedback that actively encourages further learning on writing (coded as "F");
- Feedback that provides motivational evaluations of learners' performance (coded as "M");
- Feedback that provides demotivational evaluations of learners' performance (coded as "DM").

In Brown and Glover's original framework, the content-oriented category evaluates the substantive aspects addressed in the feedback. This involves scrutinising whether the feedback adequately highlighted content-related issues within the students' writing, including conceptual clarity, argumentation, and relevance to the topic. For appropriate skill development, this category focuses on examining the extent to which the feedback contributes to enhancing students' writing skills.

In our revised framework, we purposely excluded these two categories. Content was heavily emphasised in the second-layer coding, whereas for skill development, our focus was on

formatting academic writing. The shift from "appropriate skills" to "academic writing skills" allowed us to pay attention to formatting and citation practices, which were fully discussed in the second layer.

A slight modification was made for the other three categories. Encouragement of further learning aimed to determine whether the teacher provided opportunities for the students to deepen their knowledge beyond the immediate scope of the assessment. For example, the comment in Figure 6 advised the student to look at the supplementary materials for learning. Encouraging further learning involves prompting students to engage in additional research, reading, or exploration of related topics. Similarly, as shown in Figure 5, the use of lower-level and rhetorical questions can serve as persuasive devices in written feedback. This form has been proven to have scaffolding functions in promoting content learning, critical thinking, and motivation (Rozas, 2018).

The fourth category involved feedback that inspired students in their writing endeavours, contrary to the fifth category, where demotivational factors could potentially undermine the students' motivation or confidence. Positive reinforcement, constructive praise, and recognition of strengths were analysed to assess their motivational impacts on students' engagement with writing and self-efficacy. For example, Figure 7 shows a straightforward comment that motivated the student. On the contrary, Figure 8 is a critical comment, without constructive guidance, which may have hindered the students' enthusiasm or commitment.

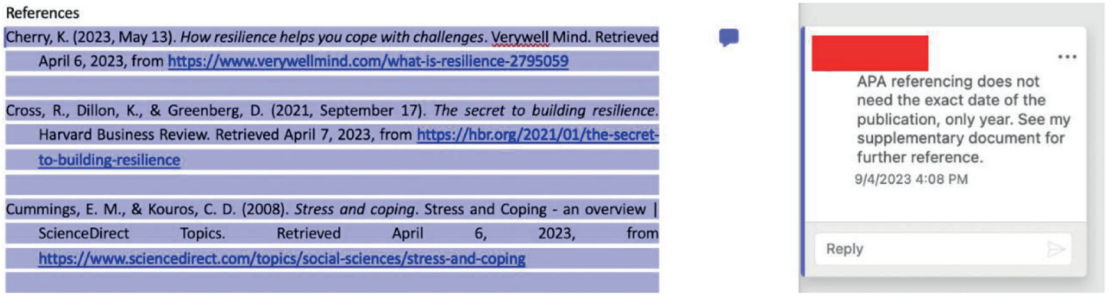

Figure 6 Example of teacher feedback encouraging further learning.

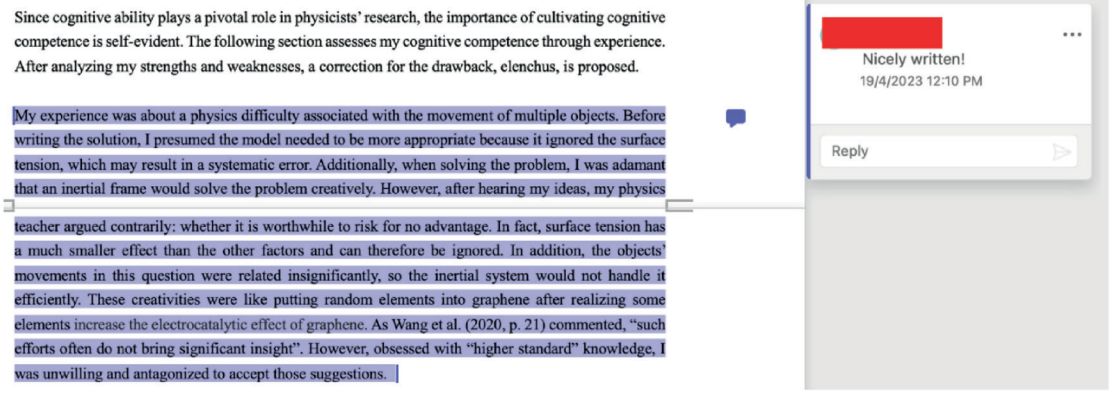

Figure 7 Example of motivational teacher feedback.

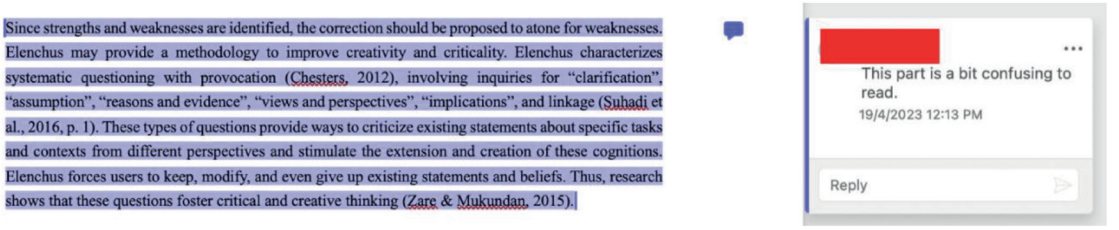

Figure 8 Example of demotivational teacher feedback.

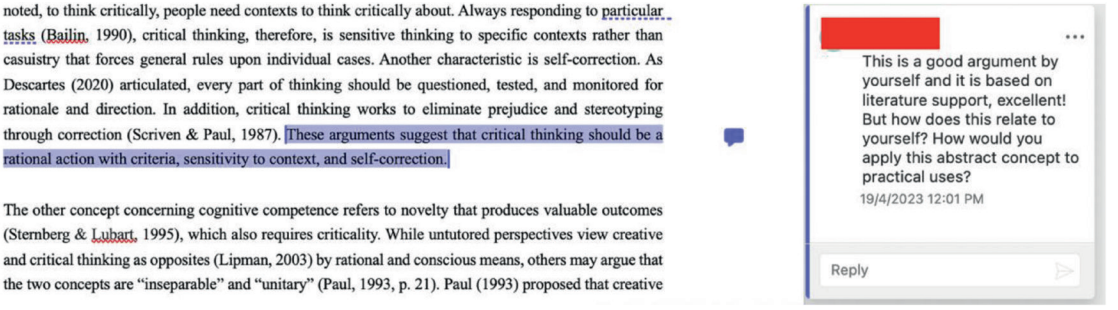

Figure 9 Example of motivational plus demotivational teacher feedback.

Our data revealed a blend of both motivational and demotivational comments, which is often known as the "art of words", employing positive feedback before giving suggestions or critical feedback. Figure 9 is such an example in the data.

To apply FCS, one researcher served as the primary coder, responsible for coding all the feedback items, while the other researcher coded half of the items to ensure inter-coder reliability. Following a discussion on the differences between the two sets of coding, a consensus was reached to enhance the accuracy and reliability of the codingBottom of Form.

Analysis of the Interview Data

The interview data were first transcribed and later translated into English. The translations were then verified by an experienced translator. Past scholarly works have demonstrated that the classification and characterisation of how learners perceive teacher feedback can help researchers understand the nature of their responses in an open-ended learning situation (Diefes-Dux et al., 2012). Therefore, we conducted a thematic analysis, a conventional approach typically used in qualitative studies (Boyatzis, 1998), to understand the learners' perceptions.

Thematic analysis identifies, analyses, and reports patterns of themes within a given set of data (Braun & Clarke, 2006). It involves interpreting different aspects of topics and traversing a range of themes in the data. Despite its widespread use, there remains a lack of clear and standardised instructions for conducting thematic analyses (Boyatzis, 1998). Nonetheless, numerous foundational works have explained the process and practicality of thematic analysis (e.g., Attride-Stirling, 2001; Rubin & Rubin, 1995), conveying its benefits for capturing important insights in relation to the research questions in a study.

In this study, we aimed to extend the concept of thematic analysis by offering a more detailed examination. Firstly, we categorised the students' opinions into "positive" and "negative" themes. This served as a broad category to further facilitate more detailed areas. Secondly, we

focused on the perceived advantages and disadvantages of teacher feedback and AI-generated feedback, as reported by the students. Lastly, we summarised these findings into generalised themes. This approach allowed us to target: (1) the students' overall attitudes (i.e. positive and negative) towards teacher and AI-generated feedback, and (2) their rationalised opinions in the form of the perceived advantages and disadvantages when they were asked to compare the two types of feedback. This approach contributed to a deeper understanding of the students' overall perceptions.

Findings

The Nature of Teacher Feedback

Table 2 presents an overview of the various types of teacher feedback and their respective frequencies across the three layers. In the following sections, we delve deeper into each layer, providing a comprehensive analysis of our findings together with examples.

First-Layer Coding

As shown in Table 3, both direct and indirect feedback were observed across the four essays. Two items were identified as "undefined", as they only offered positive feedback on certain aspects of the writing and did not offer additional suggestions or identify any errors within the text. Examples can be seen in Figures 10 and 11.

Table 2 Types and numbers of feedback items across four essays.

Coding		Essay 1	Essay 2	Essay 3	Essay 4
First layer	Direct feedback (coded as "DF")	3	1	5	2
	Indirect feedback (coded as "IDF")	16	6	15	12
	Undefined (coded as "X")	0	0	0	2
Second layer	Language use accuracy (coded as "LUA")	6	3	6	0
	Academic writing format (coded as "AWF")	12	1	7	4
	Writing structure (coded as "WS")	1	1	2	2
	Argument validity (coded as "AV")	3	2	5	7
	Undefined (coded as "X")	0	0	0	2
Third layer	Further learning (coded as "F")	5	3	5	8
	Motivational feedback (coded as "M")	1	2	0	6
	Demotivational feedback (coded as "DM")	4	4	11	6
	Undefined (coded as "X")	11	1	6	3

Table 3 Numbers and percentages of teacher feedback for the first-layer codes.

	Essay 1	Essay 2	Essay 3	Essay 4
DF	3 (15.79%)	1 (14.29%)	5 (25.00%)	2 (12.50%)
IDF	16 (84.21%)	6 (85.71%)	15 (75.00%)	12 (75.00%)
X	0	0	0	2 (12.50%)
Total	19 (100%)	7 (100%)	20 (100%)	16 (100%)

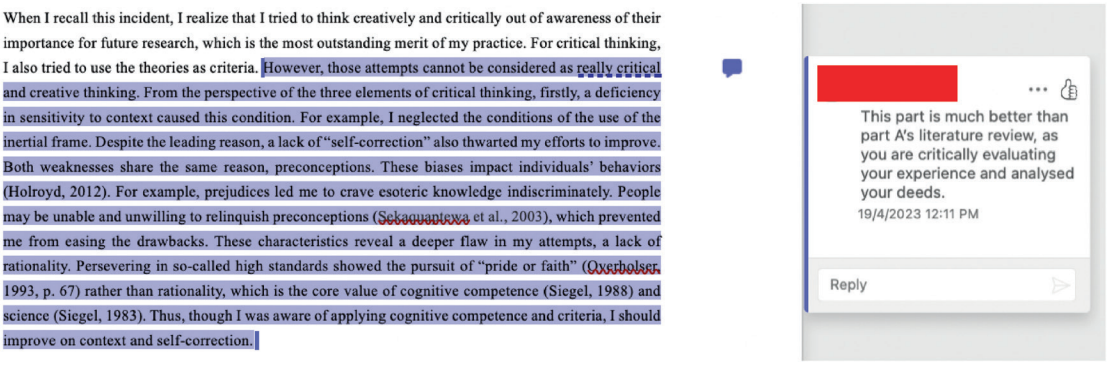

Figure 10 Example of teacher feedback coded as "undefined".

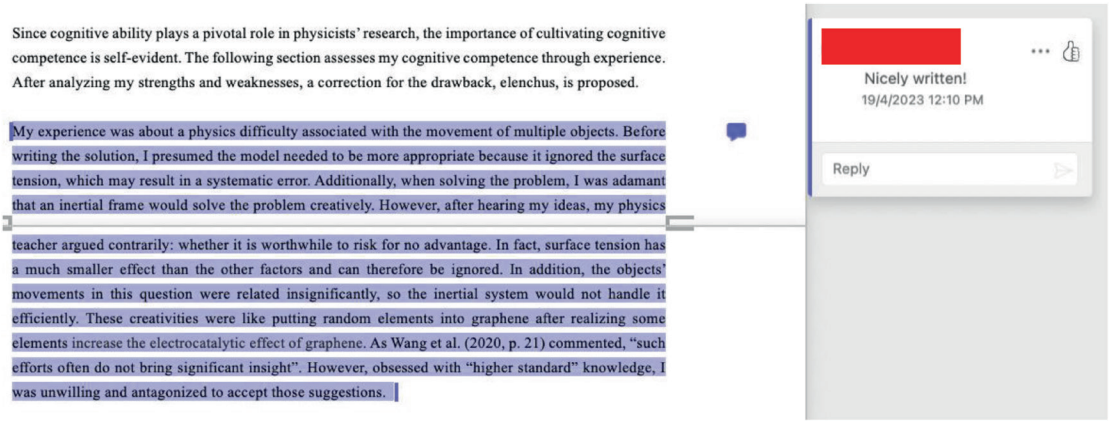

Figure 11 Example of teacher feedback coded as "undefined".

In Table 3, the distribution of frequencies revealed the predominant occurrence of indirect teacher feedback, constituting more than 75% across the four essays. Indirect feedback entails identifying errors within writing without providing the correct forms to the students. This type of feedback is commonly favoured (Ferris & Roberts, 2001), in contrast to direct feedback, which explicitly points out errors and provides the correct replacements (Lalande, 1982; Robb et al., 1986). This observation underscored one feature, namely a preference for giving indirect forms of feedback.

Second-Layer Coding

Table 4 illustrates the dimensional distribution that was evident across the four essays. The same two positive feedback items in the first layer (see Figures 10 and 11) were considered to be "undefined", as they did not offer any feedback related to the assessment criteria.

The "Language use accuracy" component effectively served its purpose of providing CF on linguistic errors (i.e., 27.27%, 42.86%, and 30.00% for Essays 1, 2, and 3, respectively). According to the assignment criteria, "Academic writing format" addressed the formatting aspects of EAP. This type of feedback constantly recurred throughout all four essays, notably at 54.55% in the first essay, highlighting the students' struggles with academic writing conventions such as referencing and quotations. A wider range of feedback was provided on writing structure, comprising around 10%, and on argument validity, at an average of around four items per essay. This expanded array of feedback was geared towards improving the students' proficiency in structural organisation and critical writing skills.

Third-Layer Coding

Table 5 illustrates the distributions of teacher feedback for the third layer of coding. Various distributions were evident across the essays. Unlike the preceding two coding processes, this layer had a higher number of "undefined" feedback items in writing: 21 out of 76 items. This stemmed from the general comments on students' lower-level errors, such as the examples shown in Figures 12 and 13. In these instances, the teacher directly pointed out the issues for improving the students' current writing without providing feedback on further learning or offering de-/motivational insights.

Table 4 Numbers and percentages of teacher feedback for the second-layer codes.

	Essay 1	Essay 2	Essay 3	Essay 4
LUA	6 (27.27%)	3 (42.86%)	6 (30.00%)	0
AWF	12 (54.55%)	1 (14.29%)	7 (35.00%)	4 (26.67%)
WS	1 (4.55%)	1 (14.29%)	2 (10.00%)	2 (13.33%)
AV	3 (13.64%)	2 (28.57%)	5 (25.00%)	7 (46.67%)
X	0	0	0	2 (13.33%)
Total	22 (100%)	7 (100%)	20 (100%)	15 (100%)

Table 5 Numbers and percentages of teacher feedback for the third-layer codes.

	Essay 1	Essay 2	Essay 3	Essay 4
F	5 (23.81%)	3 (30.00%)	5 (22.73%)	8 (34.78%)
M	1 (4.76%)	2 (20.00%)	0	6 (26.09%)
DM	4 (19.05%)	4 (40.00%)	11 (50.00%)	6 (26.09%)
X	11 (52.38%)	1 (10.00%)	6 (27.27%)	3 (13.04%)
Total	21 (100%)	10 (100%)	22 (100%)	23 (100%)

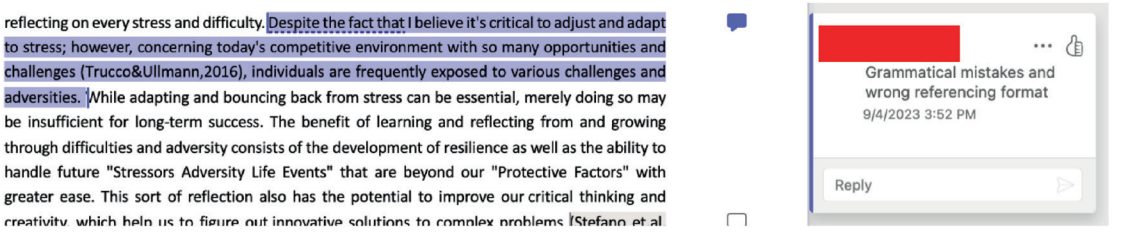

Figure 12 Example of teacher feedback classed as undefined.

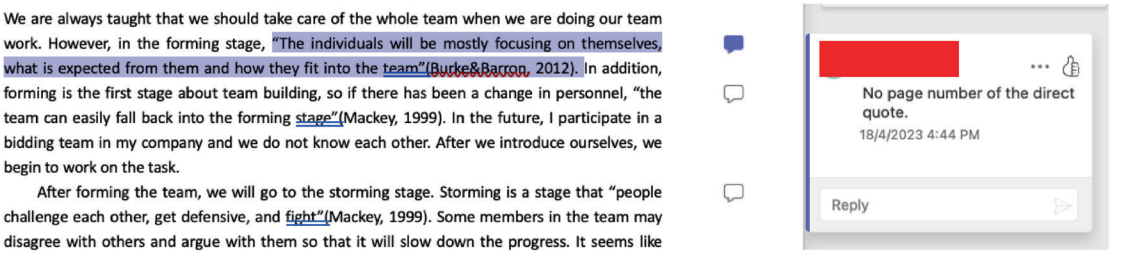

Figure 13 Example of teacher feedback classed as undefined.

From Table 5, it is evident that more than one-third of the feedback items aimed to encourage students to engage in further learning across the four essays (i.e., 23.81%, 30.00%, 22.73%, and 34.78%). This type of feedback was specifically designed to foster the students' ongoing learning efforts in their future endeavours. However, limited instances of motivational feedback were identified, numbering only 1, 2, 0, and 6 for each essay. This indicated that a positive motivational dialogue was poorly represented across the four essays. De-motivational comments emerged as the most prominent category, particularly in Essay 3, where no positive comments were made, but 11 demotivational comments were identified. This disparity underscored the lack of praise and encouragement in feedback. Bottom of Form

Learners' Perceptions of Teacher Feedback in the Context of GenAI

In this section, we emphasise the participants' perceptions of their previous experiences with EAP teacher feedback and AI-generated feedback. The students' perspectives were highly valued, providing insight into the roles that both types of feedback play in enhancing their disciplinary writing.

A range of positive and negative themes were identified within the dataset. Tables 6 and 7 present the frequencies and categories of themes separately for each of the four participants. The students' overall attitudes towards the teacher's feedback were predominately positive, even when juxtaposed with the broad use of GenAI, where the students had access to instant tools and resources through GenAI.

Preference for Teacher Feedback Despite the Advantages of GenAI

Students' preferences for teacher feedback were emphasised by their mentions of positive and negative themes, with a predominant occurrence of 19 positive themes compared with one negative instance (see Table 6). Numerous instances highlighted the students' acknowledgement of

Table 6 Frequencies of themes expressed by participants (teacher feedback).

	Themes	Themes by participants (frequencies)				Total
		Participant 1	Participant 2	Participant 3	Participant 4	
Positive	High efficiency	3	–	1	–	19
	High quality and helpful	1	2	1	1	
	Critical and creative	1	2	–	2	
	Specific	–	–	1	4	
Negative	Misunderstanding	–	–	–	1	1

Table 7 Frequencies of themes expressed by participants (GenAI).

	Themes	Themes by participants (frequencies)				Total
		Participant 1	Participant 2	Participant 3	Participant 4	
Positive	Lower-level mistake correction	3	–	2	–	13
	Brainstorming ideas or researching	1	1	–	3	
	High efficiency	–	1	1	–	
	Neutral	–	–	–	1	
Negative	Mistakes or inaccurate information	–	1	2	1	10
	Fixed writing	2	–	–	–	
	Repetitive	–	1	–	–	
	Extra evaluation by the student	1	–	–	–	
	Not helpful	–	1	–	–	
	Originality	–	–	–	1	

the high quality and efficiency inherent in teacher feedback, particularly in the context of this target assignment.

For instance, Participant 1 articulated her time constraints as a first-year student, as she had many tasks to complete by the end of the semester. Consequently, she found great value in the teacher's efficient delivery of feedback, especially in non-face-to-face interactions. Moreover,

she noted that the teacher's feedback facilitated her critical thinking regarding potential revisions to her writing, which was a sentiment echoed by the two other participants.

> Participant 1: *"… I do believe the EAC services are of* high efficiency. *I can just read the teacher's comments and revise myself. I don't need to ask teachers and wait for their feedback. This also leaves time for me to* critically evaluate the content *and revise it…"*

The specific comments offered by the teacher were also highly favoured by the students. Participant 4, in particular, constantly emphasised how the specific areas for improvement had greatly benefited him.

> Participant 4: *"…the teacher provided* very specific feedback *on our work…"*

> Participant 4: *"…the teacher* understands the requirements of our assignment… *they can provide specific help according to our assignment requirements."*

A notable negative comment was made by Participant 4, who expressed scepticism, noting that teachers may occasionally misunderstand the students' thoughts. He mentioned that this misunderstanding may potentially cause inaccurate suggestions.

> Participant 4: *"There might be* misunderstanding *between me and teachers. They might not give corrective suggestions because of the* misunderstanding."

Despite the effectiveness of teacher feedback, students also recognised the potential benefits of utilising GenAI tools in writing. A set of GenAI tools were mentioned, including Grammarly, ChatGPT by OpenAI, and Quillbot.

Most participants emphasised the high efficiency of GenAI tools. This feature is distinct from the "high efficiency" theme mentioned in the discussion of teacher feedback. The participants noted that chatbots such as ChatGPT react immediately after the users submit questions to the chatbot, which gives them very fast responses, and the users can ask questions multiple times.

> Participant 1: *"The advantage is* very fast. *You [send] the stuff over and a few seconds later, it will give you responses. You can* send your writing for several times."

> Participant 2: *"Advantage is: GenAI can* give very quick responses. *You can ask many questions or even send a whole passage."*

Another two advantages frequently mentioned by the students were the correction of lower-level language mistakes and AI's ability to brainstorm or research specific topics.

> Participant 3: *"…I will use GenAI tools for helping me correct some* lower-level grammatical mistakes. *I can correct them immediately after they give me feedback."*

> Participant 4: *"I think sometimes computers or AI may generate some ideas that we may not be able to think. But in terms of* content or idea generation*, AI may be better."*

Even though they recognised GenAI tools' direct benefits, when queried about their needs for future genre-specific assignments, all participants firmly expressed a preference for teacher feedback.

> Participant 3: *"I will use GenAI tools for correcting my grammatical mistakes but I will definitely choose teacher feedback, as teachers can give more specific and helpful suggestions."*

> Participant 4*: "I may give GenAI a try but I doubt for it in the long term. I will go for teacher feedback."*

GenAI Tools: Room for Improvement

The 10 negative themes outlined in Table 7 effectively demonstrate the students' concerns regarding their previous use of GenAI tools. Many noted that their major concern was the mistakes the GenAI tools made or the inaccurate information they provided. For example, Participant 3 consistently mentioned that her use of GenAI often resulted in accompanying mistakes.

> Participant 3: *"I think the major concern I have is the* mistakes *AI tools can make. I think because of the training models, AI tools may convey meanings* inaccurately *or change correct information to wrong one."*

> Participant 3: *"AI always* makes mistakes *and give me* inaccurate information*."*

Moreover, Participant 1 expressed the need to double-check ChatGPT's feedback and allocate more time to evaluate the validity of the information provided. This extra effort consumed more of her time. She also suggested that, at times, the feedback received from AI tools exhibited a very fixed structure and pattern. Viewers might easily recognise this type of feedback as being generated by AI. She also implicitly showed concern that this would lead to a deduction of marks when the teachers reviewed the content.

> Participant 1: *"I will have to consider how to revise ChatGPT's feedback and evaluate if it's giving me the* accurate and valid information*…"*

Another issue that Participant 4 mentioned was the originality of AI-generated content. The emergence of GenAI technologies in mid-2023 has caused a huge global debate regarding the originality and copyright of its content (Fenwick & Jurcys, 2023). It has been a concern for students that the content generated lacks citations and referencing.

> Participant 4: *"I think there may be some concerns about the* originality *of the assignments if I use AI. So I seldom use it, perhaps also due to my personality?"*

All the issues and concerns raised by students indicated that there is still ample room for improvement for AI, especially in the context of EAP, where more requirements and original ideas are needed. Although GenAI tools such as Grammarly or ChatGPT offer swift and accurate corrections on lower-level mistakes in language, they are limited in their linguistic variety. The major concerns regarding the inaccuracy and originality of information still require significant areas for future upgrades.

Discussion

In response to the first research question regarding the nature of EAP teacher feedback on EFL disciplinary writing, we employed three layers of FCS to reveal the key features.

Our first-layer coding showed a prevalent amount of indirect feedback, with few instances of direct feedback on lower-level linguistic errors (see Table 2). Chandler (2003) emphasised the efficacy of indirect feedback in language learning, particularly when learners can revise their mistakes by themselves. This resonated with Lalande's (1982) notion of enhancing learners' problem-solving skills and guiding them to learn. The application of indirect correction aligned well with the objectives of structured EAP assignments and the functions of feedback, which aim to foster independent thinking and deeper understanding (Higgins et al., 2002). Therefore, the connection between indirect feedback and the nature of EAP assignments lies in their shared goal of empowering students to actively engage with their own writing process and develop their linguistic and cognitive abilities.

Additionally, it is important to consider the effectiveness of indirect feedback for learners with varying levels of English proficiency. For students with poor English skills, indirect feedback might be challenging to comprehend, which may lead to difficulties in making the necessary corrections (Lee, 2005). In such cases, direct feedback could be more beneficial, as it provides the students with clear guidance and correct forms. However, the four participants recruited in this study had all passed the English tests required for admission to an EMI university and had completed the required EAP courses. This indicated that, technically, they were equipped with the essential language skills needed to study at an EMI university. Given this context, indirect feedback was more advantageous. This finding differed from Lee's (2005) study, which highlighted the need for direct feedback for Hong Kong secondary students because of their limited English proficiency and ability to self-correct. This difference underscores the importance of the students' backgrounds when providing feedback, as the nature of effective teacher feedback can vary, depending on the learners' proficiency levels and educational contexts.

The second layer of coding emphasised criterion-referenced teacher feedback. Feedback in this layer addressed the specific structure stipulated by the assignment's guidelines, as well as assessments of the arguments and logical coherence. More feedback items were identified concerning formatting compared with other categories, with the fewest related to writing structure. This heightened focus on the format of academic writing underscored students' shared struggle with academic writing conventions. A possible reason could be the students' unfamiliarity with academic English. Our student participants received their primary and secondary education in Mainland China and only came to Hong Kong for undergraduate education. As EFL education in China is usually in the form of task-based instruction following the spirit of communicative language teaching (CLT) (Littlewood, 2007; Qi, 2016), the students may have lacked familiarity with academic English, even though they had previously taken EAP courses at the university. Another cause of this phenomenon could be the students' failure to transfer the necessary EAP skills into discipline-specific assignments. This situation highlights the need for proper training for such students (Cai, 2017) and suggests a possible

lack of practice or neglect of EAP skills, underscoring potential shortcomings in the current EAP course's design and the need for change at the university.

Suggestions related to the assessment criteria allow students to enhance their work in accordance with the appropriate standards (Ma, 2018). Within the context of academic writing, this feature matches the homogeneous academic discourse of EAP, where students are usually taught to follow a set of standard academic discourse norms (Harwood & Hadley, 2004). This pragmatic orientation in EAP is also reflected in previous literature. Some studies have predominantly been centred on the dominant conventions in EAP teaching that "help students successfully appropriate them" (Grannell, 2022, p. 22).

However, as discussed by Grannell (2022), focusing merely on conventional EAP contexts has limitations. With the evolving complexities of academic subjects, there is a need to give greater attention to the nature of these disciplines. Notably, the teacher provided feedback dedicated to addressing an argument's validity, albeit with a comparatively limited number of instances (see Table 4). Beyond the foundational aspects of improving language and formatting, this form of communication served a higher purpose by considering genre-based communicative purposes and contextual elements (Swales, 1990). Students were made aware not only of the assessment criteria but also the "higher order discipline skills" (Hughes et al., 2015, p. 1082) such as making solid arguments or evaluating the literature, thus enabling them to obtain higher grades. Many participants mentioned a lack of confidence in English and a desire to use the teacher's feedback to improve their grades. Therefore, the teacher, when faced with disciplinary writing, should prioritise larger units of language and organisational elements of discourse over surface-level errors (Bruce, 2008).

In the third level of coding, more than one-third of the feedback aimed to encourage students towards further learning (see Table 5). This finding marked the fundamental nature of teacher feedback, which lies in furnishing students with valuable insights into the gaps between their present and desired level of knowledge, understanding, and skills (Black & William, 1998; Sadler, 1989). As described by Brown and Glover (2006), the desired outcomes of feedback should be formative (Nicol & Macfarlane-Dick, 2006), "feeding forward" students to act upon and facilitating their progress towards bridging these gaps, thereby improving their future performance.

A limited amount of motivational feedback and the prevalence of demotivational feedback in the data were identified. First, this contrast underlines the necessity for fostering more positive teacher feedback in the future. Motivational comments have the potential to boost students' confidence, making them remain engaged in learning (Fernández-Toro et al., 2013). Such improvements in teacher feedback are crucial for bolstering students' motivation in their future learning. Second, the large number of demotivational comments across the four essays, particularly Essay 3, may initially suggest a poorly representative dialogue in motivating students to learn. However, the prevalent positive attitudes towards teacher feedback found in interview data contradicted this assumption. The students consistently praised the quality and effectiveness of teacher feedback. Upon closer examination of the feedback items, we observed that the majority of demotivational cases showed no harsh or extremely critical language; instead, a slightly negative tone was used to clarify the errors stated. For instance, as seen in Figure 14, the seemingly demotivating rhetoric question served as a reminder for Participant 3 to evaluative himself in terms of writing logically. Similarly, as shown in Figure 15, the comment "confusing" may seem negative at first, but it pointed out the error in a clear and straightforward manner. While the tone or choice of words at this level may seem somewhat discouraging, it demonstrated that the students were provided with thorough explanations and reminders of their errors, ultimately ensuring the high clarity of feedback-related communication (Price et al., 2010).

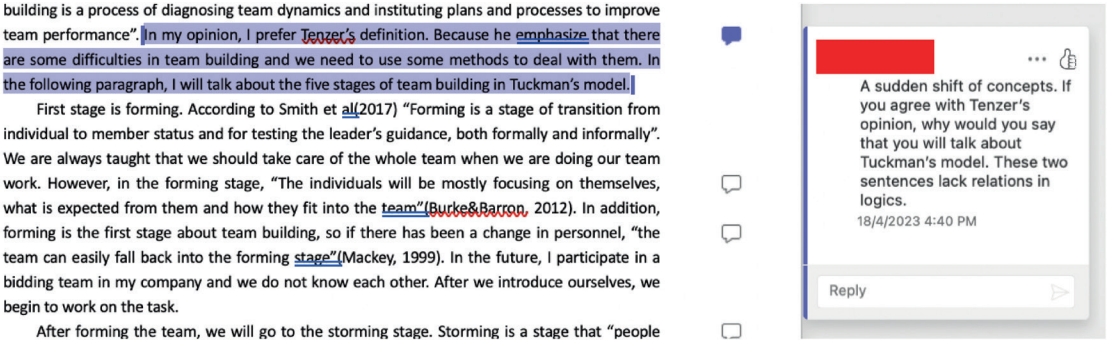

Figure 14 Example of demotivational feedback.

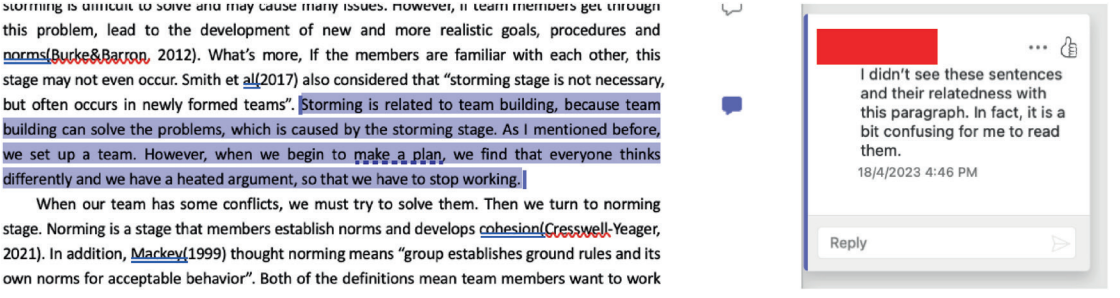

Figure 15 Example of demotivational feedback.

Building upon the previous two observations regarding motivating writing, many undefined feedback items were noted. These were more tone-neutral, practical CF items. These three observations further strengthen the contributions of Brown and Glover (2006) and Ellis (2009) by placing greater emphasis on the nature of disciplinary writing. Clearer feedback was given, according to the complexity of the disciplinary writing. It appeared that the teacher prioritised practical matters such as assisting students to correct mistakes, rather than solely focusing on motivation. Additionally, this feature underscored the importance of continued learning for L2 English students. A clearer and more direct identification of errors tends to be more effective for L2 English students, who often lack a solid foundation in language. This finding resonated with comments made by the students in the interviews, such as "effectively giving me feedback on my problems in writing" or "...of very high quality...helped me find my mistakes."

To address the second research question concerning the students' perceptions of teacher feedback, we conducted interviews with the four students, prompting them to share their views on the teacher's feedback within the context of widespread GenAI use.

The first finding regarding the students' preference for teacher feedback was primarily characterised by their frequent mention of the high quality and efficiency of teacher feedback. The high quality of feedback facilitated the effective delivery of content aimed at improving the students' writing, whereas the high efficiency of delivery allowed them to have a smooth conversation with the teacher. This attitude suggested that the students largely valued the usability of teacher feedback in assisting their writing. As Hargreaves (2013) mentioned, it is essential to understand how the learners themselves interpret and use teachers' feedback in

relation to their sense of autonomy. Therefore, whether the students could utilise the feedback to enhance their writing, as well as whether the teacher's feedback was regarded as helpful, remained significant considerations from their perspective. The occurrence of certain themes, such as being "specific", addressed the context of genre-specific writing. With clear assignment requirements, the teachers' comments became more usable for assessment, thereby ensuring higher grades for the students. This feature further demonstrated the high usability of teacher feedback that the students took into consideration.

Feedback provides valuable information that enables learners to evaluate their performance against expected or ideal standards (Graham, 2018). Learners can self-assess their writing and learn new skills while receiving feedback on their progress from their teachers. The frequent appearance of "critical and creative" feedback in the themes proved this critical role of teacher feedback in promoting L2 English writing (Ferris, 2007). Students noted that teacher feedback not only pinpointed errors for correction but also left room for them to reflect on how to improve. Some even mentioned the development of evaluative skills through this mode of communication. This indicated that the teacher feedback is perceived as instructional. If we refer to Graham's comparison of functions between teachers and computers, teacher feedback is perceived as informing students of the mismatches between the observed and desired actions, contrasting with the function of computers to correct the mismatches between the realised and idealised standards. Similarly, GenAI tools, reported to have the function of correcting lower-level mistakes (see Table 7), were recognised as supplements for their writing rather than comprehensive instructional resources to follow and learn from.

Previous studies (e.g., Lee, 2005; Li & Curdt-Christiansen, 2020) have primarily explored students' attitudes towards teacher feedback in settings with limited access to GenAI. With the extensive adoption of GenAI since late 2023, a huge global debate has arisen among lawyers, policymakers, technologists, and university teachers regarding GenAI tools and the comparison between AI and humans (Fenwick & Jurcys, 2023). The significant preference for teacher feedback over GenAI found in the data effectively addressed the irreplaceable role of EAP teachers. Findings concerning the numerous issues students encountered while using AI tools reflected the substantial concerns of GenAI users in EAP settings. From lower-level mistakes and inaccurate information to higher-end issues in writing, such as repetitive arguments or fixed writing structures, and even to originality-oriented issues, such as the theft of ideas in writing, the students consistently advocated for an additional review of AI-generated content to assess its quality. This process, while encouraging critical analysis, also demanded more time and energy than usual from them.

Perhaps it is true that many students will remain sceptical about the use of AI. However, as Participant 1 mentioned, she will strike a balance between using teacher feedback and GenAI tools when seeking help for her future subject assignments: "I don't see the problem of using both teacher feedback and AI tools. I can seek professional advice from teachers while using ChatGPT to revise my grammatical mistakes."

Conclusion

Building upon previous literature on feedback in writing (e.g., Lee, 2017), our investigation has acknowledged the multifaceted aspects of teacher feedback, the foundational principles guiding teacher feedback practices, and the significance of teacher feedback within genre-specific contexts. This background highlighted a significant research gap regarding EAP teacher feedback for first-year EFL undergraduates within discipline-specific course assignments. Addressing this gap is crucial for understanding how these students can be better supported in developing their academic writing. Previous studies on the features of

teacher feedback (e.g., Ma, 2018) also addressed this lack of resources, emphasising the need to understand the nature of teacher feedback that caters to diverse L2 writing needs. To address this research gap, we examined teacher feedback given to four Mainland Chinese students. We explored the nature of teacher feedback on genre-specific essays using a three-layer FCS. This method offered a more nuanced understanding of how EAP teacher feedback can support students' academic writing in discipline-specific courses and address their specific EAP needs.

A predominant use of indirect feedback was noted, with only a few instances of direct feedback addressing lower-level linguistic errors. This finding underscored the nature of effective teacher feedback: feedback can vary significantly according to the learners' proficiency levels and educational contexts, especially in a discipline-specific course involving students from diverse backgrounds. Indirect feedback, on the other hand, leaves room for reflective learning (Eslami, 2014). The prevalence of indirect feedback proved its efficacy in fostering students' independence and critical thinking skills in linguistic improvement.

Feedback related to formatting was more prevalent than other types. This emphasis highlighted a common deficiency in training for first-year EFL undergraduates, especially when they received non-EMI secondary education. The students' failure to transfer their EAP skills into discipline-specific assignment writing suggests the necessity for enhanced training in EAP at the university level. The focus on formatting also reflected the pragmatic orientation of feedback in EAP, guiding students to follow a set of standard norms of academic discourse (Harwood & Hadley, 2004). Additionally, there was a notable amount of feedback concerning writing structures and arguments. This indicated the criterion-referenced nature of teacher feedback, emphasising the students' adherence to the assessment criteria.

A significant amount of feedback aimed at encouraging students to learn was identified. Such feedback can not only enhance the students' immediate writing skills but also foster their overall learning development. However, our analysis also revealed a relative lack of motivational feedback, suggesting a potential area for growth in teacher feedback practices. Despite this, it also highlighted characteristics of straightforwardness and clarity in teacher feedback. This indicated that while motivational elements could be increased, the current feedback practices successfully directed students' efforts in the right direction.

Given the mass use of AI in educational settings, we focused on students' perspectives regarding their engagement with an EAP teacher's feedback and GenAI tools. Their authentic opinions and attitudes highlighted the significant role that the EAP teacher's feedback plays, and the advantages and drawbacks that AI tools have in this context while offering new insights into how students can effectively balance the use of both to enhance their writing. In the students' opinions, the EAP teacher's feedback was useful for helping students identify errors and enhancing reflective thinking, whereas GenAI tools were more effective for addressing lower-level mistakes. As most students use AI tools as supplementary aids for their assignments, the importance of effective teacher feedback remains paramount.

However, this study is limited by its small sample size, with only four student participants. Future efforts should aim to recruit more participants from various universities. Additionally, only interim drafts of one assignment were collected. Future researchers could gather multiple drafts from different academic disciplines to explore how teacher feedback varies across different writing genres. Moreover, as all the participants had previously taken a compulsory EAP writing class, they were not interviewed about their previous difficulties with EAP writing or their past engagement with teacher or AI-generated feedback. Future research may extend this aspect and conduct a preliminary examination of their past experiences. Finally, although this study focuses on the students' perceptions of feedback from EAP teachers and GenAI,

future research could also examine the subject teachers' thoughts regarding these two types of feedback to provide a more comprehensive understanding.

Declaration of interest

The authors declare that there are no conflicts of interest.

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Appendix A

Interview Questions

1. Introduction

1) Introduce the purpose and related information.
English Across the Curriculum (EAC) is a newly launched language help service that aims to provide students with some detailed feedback on their writing assignments of a course. We use either direct promotion via the subject teachers or at class. Interested students can scan a QR code to register for the EAC service. They fill out their personal information for contact and their assignment(s) that needed help and the due dates. Professional ELC teachers/tutors will then contact them in due course.
2) Ask for participant's consent to participate and record the interview.

2. Feedback on the EAC services

1) Where did you hear about the EAC services?
2) Why did you register for the EAC services?
3) How did you feel about the effectiveness and quality of the EAC services you received? Why?
4) What improvements do you think the EAC services could make in the future?

3. Feedback on GenAI tools

1) Have you ever used any GenAI platforms or tools? What are they?
2) Do you think that, in terms of the effectiveness of improving your writing, GenAI performed better than EAC's assistance? Or do you think EAC's assistance is better than GenAI's help? Can you give us more specific reasons?
3) Do you think the feedback provided by GenAI is helping you improve the quality of your writing?
4) For your future written or oral assignments, would you like to try some GenAI tools or try them again?
5) For your future written or oral assignments, would you like to try the EAC services or other kinds of teacher assistance again?
6) Compared with teacher-assisted feedback, what do you think the advantages and disadvantages of the GenAI-assisted feedback are?
7) Compared with GenAI help and its feedback, what do you think the advantages and disadvantages of the teacher-assisted feedback are?

4. Wrap up

1) Ask if the student has any questions that they would like to ask at the end.
"Is there anything else you'd like to talk about this study or your experience?"
"Do you have any questions?"
2) Thank the student for their participation and stop recording.

Appendix B

Three-Layer Feedback Coding Scheme

Layer	Categories	Definitions
One	Direct feedback (coded as "DF")	Feedback that provides the learners with the correct form to replace the erroneous one (Lalande, 1982; Robb et al., 1986).
	Indirect feedback (coded as "IDF")	Feedback that indicates and locates errors within the students' writing without providing the correction outright (Chandler, 2003; Ellis, 2009).
Two	Language use accuracy (coded as "LUA")	Linguistic feedback that looks at the grammar, vocabulary usage, and punctuation of the writing's content.
	Academic writing format (coded as "AWF")	Feedback that offers guidance on the adherence to established standards concerning referencing, quotations, and referencing lists, ensuring the integrity of students' academic discourse in the setting of higher education.
	Writing structure (coded as "WS")	Feedback that addresses the organisation and coherence of the writing's content.
	Argument validity (coded as "AV")	Feedback that considers the effective or critical arguments made in writing.
Three (Brown & Glover, 2006)	Further learning (coded as "F")	Feedback that actively encourages further learning on writing.
	Motivational feedback (coded as "M")	Feedback that provides motivational evaluations of learners' performance.
	Demotivational feedback (coded as "DM")	Feedback that provides demotivational evaluations of learners' performance.