Fostering student engagement with feedback: an integrated approach

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Abstract

The construct of student engagement with feedback has gathered increasing attention in higher education because of its positive association with student learning outcomes. But while the literature recognises its importance, there is little research on what pedagogical approaches facilitate this engagement. This case study explores an authentic classroom and how a group of 33 students engaged with a pedagogical approach that systematically integrated three types of feedback on academic writing: automated, peer, and teacher feedback. The study was conducted at a Chinese university and based on the analysis of multiple drafts of students' written assignments, the feedback provided by an automated writing evaluation system, peers, and a teacher, and transcribed retrospective interviews with the teacher and students. We found that the majority of students actively engaged with this integrated approach and that it effectively promoted students' behavioural, affective, and cognitive engagement with feedback on their writing and encouraged thoughtful revisions. We conclude with pedagogical implications and offer suggestions for improving student engagement with feedback in similar tertiary contexts.

Keywords: student engagement; AWE feedback; peer feedback; teacher feedback; second language writing

1 Introduction

Interest in how students engage with feedback has grown substantially in higher education in recent years (e.g., Han & Hyland, 2015; Handley, Price, & Millar, 2011; Price, Handley & Millar, 2011; Winstone, Nash, Parker & Rowntree, 2017). This is because it is the *student engagement with feedback* rather than the feedback itself that is crucial to learning. Feedback is a means to a greater end and is most effective when it

'feeds-forward' beyond the revision of a current text to inform the student's subsequent tasks and future performance. Research shows that engagement is essential to tap its potential for improving student learning (Zhang & Hyland, 2018).

Student engagement, however, is a complex process. Not only might students disengage at any point (Price et al., 2011), but we know little about the kinds of factors which might encourage it. It is apparent that teachers play a pivotal role in promoting student engagement with feedback as they can influence learner perceptions, create a facilitative environment, and provide different modes of feedback (e.g., Handley et al., 2011; Lunt & Curran, 2010). Few studies, however, have explored what practical approaches can facilitate student engagement with feedback to bring about positive learning outcomes and this paper seeks to address this gap. This case study explores an authentic English as a second language (L2) course where students have access to three different types of feedback on their writing: teacher, peer and automated writing evaluation (AWE) feedback. The paper reports an authentic teaching situation without researcher intervention. While focusing on one teacher and 33 students raises issues of generalisability, it is a valuable means of investigating issues of student engagement in considerable depth. Teachers in both higher education and L2 contexts might therefore see useful parallels in their own situations and consider integrating different types of feedback into their own situations. We address two research questions:

1. What pedagogical approaches and feedback practices did the teacher use in the course?
2. How did the students engage with these pedagogies and types of feedback when writing and revising?

2 Engagement and its relevance to feedback

Engagement is a key concept in student uptake of feedback and necessary for feedforward benefits. Originating in the field of education research (e.g., Newmann, 1981; Tyler, 1969), engagement emerged as a response to student alienation and dropout rates in schools. In a review of 44 studies using the term 'engagement', Fredricks,

Blumenfeld, and Paris (2004) identified three types of engagement: behavioural, emotional, and cognitive. While this conceptualisation initially referred to broad social forms of engagement such as positive conduct, psychological investment in learning, and how students engage with school, teachers and other pupils, the concept has powerful analytical and descriptive potential for understanding student engagement with written assignments and feedback (Price et al., 2011).

The relevance of engagement to feedback research is seen in the work of Handley et al. (2011) who focus on how students engage with teacher feedback in higher education. Following Fredricks et al. (2004), Handley et al. (2011) conceptualise engagement with feedback as a) a readiness-to-engage with feedback and b) positive active engagement with feedback. The former is a willingness to invest time and effort in an assignment and its ensuing feedback, and the latter involves reflecting on feedback and activities such as asking questions and interacting with feedback providers.

The original tripartite conceptualisation of student engagement is more explicit in Ellis' (2010) work on second language acquisition. He uses the term 'engagement' to denote how learners respond to oral and written corrective feedback and refers to: (1) cognitive, focusing on how learners attend to feedback, (2) behavioural, focusing on whether and how learners take up feedback in their revisions, and (3) affective, focusing on learners' attitudinal responses to feedback. Again, we see engagement conceived as a multidimensional construct that seeks to theorise individual components of learning as a purposeful focus on a task. Ellis, however, is more concerned with error correction than with students' use of feedback in writing.

Informed by these studies and based on participant interviews and analyses of textual revisions, Zhang and Hyland (2018) proposed a model to examine student engagement with feedback in L2 writing. They operationalised student engagement as follows:

- **Behavioural engagement** refers to students' physical reactions to feedback including revision actions and time spent on revision.
- **Affective engagement** comprises students' emotional responses and attitudinal reactions to feedback as evidenced in retrospective interviews.

- **Cognitive engagement** is concerned with how students respond to feedback through revision operations (such as rewriting and reorganisation) and cognitive strategies (such as evaluating and monitoring).

In this study, we adopt Zhang and Hyland's (2018) engagement model, which has been cited in several recent studies (e.g., Koltovskaia, 2020; Yu, Zhang, Zheng, Yuan & Zhang, 2019), to analyse how the students respond to an integrated approach in their L2 writing.

3 Studies on student engagement with feedback

Traditionally, most feedback research has focused on identifying the effectiveness of teacher feedback practices, such as the specificity and length of feedback, its timing, and the modes of delivery (e.g., Boud & Molloy, 2013; Henderson, Ryan & Phillips, 2019; O'Donovan, Rust & Price, 2016; Yang & Carless, 2013). Despite these variations, however, studies consistently reveal the dissatisfaction that many students feel about the feedback they receive. They often find it difficult to interpret and act on (Mulliner & Tucker, 2017) and voice frustration over its lack of detail and timeliness (Boud & Molloy, 2013).

To address the issue of student uptake, peer feedback and computer-generated feedback have been introduced and compared with teacher feedback (e.g.,Miao, Badger & Zhen, 2006; Nicol et al., 2014; Zhang and Hyland, 2018). Peer feedback is believed to expose students to alternative perspectives, encourage negotiation of meaning, provide emotional support, and promote collaborative learning (e.g., Harland, Wald & Randhawa, 2016; Mulder, Baik, Naylor & Pearce; 2014; Nicol, Thomson & Breslin, 2014), and AWE feedback is reported to have some advantages over teacher feedback for its immediate diagnostic assessment and multiple drafting opportunities (e.g., Stevenson & Phakiti, 2014; Ware, 2011; Zhang 2017).

But regardless of the type of feedback they receive, it seems that students have their own learning agendas and bring their own interests and experiences when they engage with feedback (Hyland, 1998). As a result, there is now greater interest in the receivers

than the providers of feedback, focusing on students' engagement (Price et al., 2011) and use of feedback (Winstone et al., 2017). Students generally express a desire for richer feedback that includes different modes of feedback (e.g., written, peer, verbal, digitally recorded and automated) (Henderson et al., 2019). This shift to seeing students as active users of feedback rather than passive receivers encourages us to better understand how students engage with the feedback they are given and how this engagement can be facilitated.

A handful of studies reveal that various factors can affect the extent of a student's engagement, with learner beliefs and skills (Adams, Wilson, Money, Palmer-Conn & Fearn, 2020), contextual and institutional factors (Christenson, Reschly & Wylie, 2012; Handley et al., 2011) and the mode of feedback delivery (Lunt & Curran, 2010) all potentially important. Such understandings, however, remain largely theoretical and few studies have explored what practical approaches can facilitate student engagement with feedback to bring about positive learning outcomes.

One line of research has compared teacher feedback with peer and computer-generated feedback (e.g., Denton et al., 2008; Dikli & Bleyle, 2014; Miao et al., 2006; Zhao, 2010). While these comparative studies offer some useful insights, they produce dichotomies which are misleading, often ignoring individual student preferences and failing to adequately control for local variables. Each type of feedback has its pros and cons depending on the learning context. It is also the case that many studies are limited to students' self-report surveys or interviews, with little attention given to their texts (e.g., Price et al., 2011; Zepke et al., 2014). This absence of methodological triangulation may compromise the research findings and restrict results to self-report rather than actual behaviour. The study of how students actually respond to feedback, revealed in their writing and revision, combined with the voices of teachers and students themselves, can bring greater rigour and offer a more nuanced understanding of how students engage with feedback in assignments.

Several recent studies have looked at how students engage with teacher, peer, and computer-generated feedback from behavioural, affective, and cognitive perspectives

(e.g., Han & Hyland, 2015; Yu et al., 2019;). While the results help to illuminate how and why individuals engage, or do not engage, with different types of feedback, students in these studies students received just one type of feedback. In reality, of course, students not only have access to different types of feedback but may also actively seek information from others (Boud & Molloy, 2013). Our study sets out to address how students consider their options and engage with three different types of feedback – AWE, peer, and teacher feedback – on their L2 writing in an authentic context, and how the integration of these types of feedback can influence student engagement.

4 Methods

4.1 Context and participants

The participants in this study were one teacher and 33 students at a Chinese university.

The teacher, Hong, was selected from a group of eight teachers from different disciplines who had received teaching excellence awards from the university and received high scores in class evaluations by students. Hong was a female teacher from China with a master's degree in English Language Education and over 15 years' experience of teaching English. She was approached by the first author and agreed to join the study in order that we might learn why she was regarded as a popular and effective teacher through her teaching. The students in the study were 33 third-year Chinese students, six males and 27 females, majoring in English in the same class[1]. This class was selected from the five taught by Hong as it was the only one that focused on writing. After being told the purpose of our research, the students agreed to share their written assignments with us and join the interview sessions.

The course, 'Advanced Academic English', focused on academic reading and writing skills. During the 16-week semester, Hong assigned two 800-word essays: *A Reflection on University Life* and *The Advantages and Disadvantages of Self-employment*. For each essay, the students received three types of feedback: AWE, peer, and teacher feedback.

[1] In Chinese universities, students are usually placed in a fixed class with a name and a number according to their major throughout their study (e.g., English Literature Class 3).

The AWE system, *Pigai*[2], generates feedback on texts comprising real-time holistic scoring, diagnostic feedback, and overall end comments through language processing technologies and statistical algorithms, which is similar to Criterion® and MY Access!®.

It is worth mentioning that *Pigai* has been used by over 20 million students in about 6,000 schools in China (Zhang & Zhang, 2017) and, like many teachers, Hong was aware of the programme. To familiarise the students with the system, she demonstrated how AWE feedback works in the first lecture. Similarly, she provided the students with detailed instructions on how to offer effective peer feedback and the kinds of questions that might encourage reviewees to reflect on and rework their texts. To facilitate peer feedback, Hong asked the students to form dyads, allowing them to select their own partners, and this resulted in 15 pairs and a trio. Peer feedback was conducted outside of the classroom where the students were not subject to time constraints in class. Teacher feedback was offered after the students had revised their drafts based on AWE and peer feedback. Each essay counted for 30% of the final course grade.

4.2 Data collection and analysis

Drawing on a model of student engagement and several recent studies (e.g., Han & Hyland, 2015; Yu et al., 2019; Zhang & Hyland (2018), we believe that student behavioural, affective, and cognitive engagement with feedback can be explored through revisions to student texts, reflective commentary and interviews. Our study therefore differs from a great deal of previous work by looking closely at student revision operations and examining how and why these revisions were made. We therefore focus in some depth on the first of two essays assigned by the teacher entitled *A Reflection on University Life*. This was to avoid overburdening the participants. Originally, we planned to interview one student from each peer review group, 16 in all, but five groups were unavailable due to school commitments. Our data thus comprised all the texts written by the 33 students, feedback on these texts, and retrospective interviews with the teacher and 11 students.

[2] The URL for *Pigai* is www.pigai.org

The AWE-peer-teacher feedback process in Hong's course saw each student producing four drafts for the essay. When the students finished their first drafts, they submitted to *Pigai,* and they produced their second drafts based on AWE feedback. The second drafts went to peer reviewers where, to facilitate revision and encourage the 'feedforward' value of peer comments, Hong required each student to write a reflective report in English responding to the peer feedback they had received in the revision process. She made it clear that the report also needed to include a critical reflection on the strengths and weaknesses in their essay as well as possible solutions to the problems. Then, the students generated their third drafts. Hong collected all third drafts to provide comments but delayed the grades to help the students make further revision. Finally, the students completed their fourth drafts and submitted them to Hong for grading. A total number of 132 student texts were collected.

Our textual analyses included both students' texts and the feedback on their texts. Each intervention on the students' texts was considered as one feedback point (Hyland, 1998). We counted all the feedback points and coded them following a modified version of Ferris's (2006) taxonomy of error focus and the classification of feedback categories used by Zhang and Hyland (2018). Overall, 12 types of error focus and five feedback categories were identified. Informed by Faigley and Witte's (1981) revision taxonomy and Zhang and Hyland 's (2018) categorisation of revision operations, the changes made in students' revised drafts were coded as: zero correction, effective correction, ineffective correction, addition, deletion, substitution, and rewriting (see Table 1).

The initial inter-coder agreement rate for coding error focus, feedback categories, and revision operations were 86.5%, 82.7% and 80.2%, but after discussions and revisions, the inter-coder agreement rates of the three sets of data rose to 98.2%, 95.6%, and 92.1%.

Hong was interviewed by the first author in English for approximately 90 minutes concerning her teaching experience and feedback beliefs and practices. The 11 students were interviewed separately by the first author in 60-minute sessions. The student interviews were conducted in Chinese (their L1) to put the students at ease and allow them to express themselves more clearly. A semi-structured format with open-ended

prompts was used, and students were able to talk about particular aspects of feedback they had received and why certain revision operations were conducted. All the interviews were audio-recorded, transcribed with translations made by the first author and checked by an experienced translator.

Table 1. Revision operations

Revision operations	Descriptions
Zero correction	No response to feedback
Effective correction	Errors in grammar (e.g., verbs and nouns) and mechanics (e.g., spelling and punctuation) are correctly addressed.
Ineffective correction	Errors in grammar (e.g., verbs and nouns) and mechanics (e.g., spelling and punctuation) are incorrectly addressed.
Addition	Provision of additional words or phrases excluding error correction (example: I'm shocked → I'm extremely shocked)
Deletion	Removal of identified errors or problem areas
Substitution	Replacement of original words or phrases with new ones excluding error correction (example: rich family → affluent family)
Rewriting	Changes made at syntactic and discoursal levels excluding error correction

All the interview data were entered into NVivo 11, and went through open coding, axial coding, and selective coding (Strauss & Corbin, 1998). In the first phase, the interview data were coded manually line-by-line and assigned different categories. These categories were then analysed and grouped into broader categories in the second phase. The third phase moved from axial coding to selective coding with emerging themes and refined categories (Scott & Howell, 2008). Guided by previous studies (e.g., Han & Hyland, 2015; Zhang & Hyland, 2018), we revised and refined the categorisations and assigned items as behavioural, affective and cognitive engagement. The final inter-coder agreement rates for coding behavioural, affective and cognitive engagement were 96.2%, 93.8% and 91.5%. In the following sections we present our findings.

5 The integrated approach to feedback

We refer to Hong's pedagogical approach as 'integrated' because it combined AWE, peer, and teacher feedback as illustrated in Figure 1.

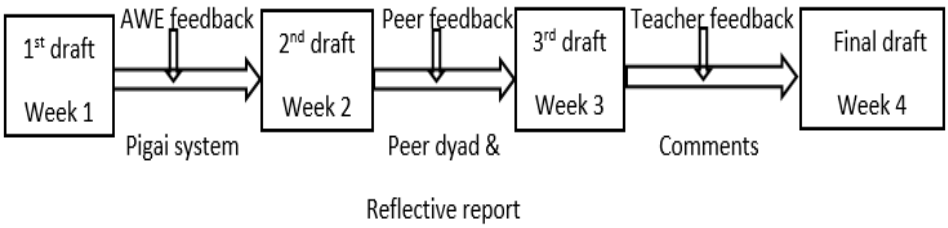


Figure 1. The AWE-peer-teacher feedback revision process

While this AWE-peer-teacher feedback revision process seems straightforward, the challenge lies in how each step can optimally engage the students. Hong asked students to submit their first drafts to *Pigai* and revise based on the feedback it offered. Because the students had different levels of L2 proficiency and writing competence, she did not set an absolute score for the students to meet but encouraged them to make multiple revisions to track their improvement. She promoted student engagement in this process by emphasising that they should try to increase their scores rather than by specifying what it should be. In other words, she attached greater importance to self-directed learning gains rather than encouraging competitions that might trigger anxiety (Micari & Drane, 2011). Figures 2 and 3 are samples of AWE feedback on the student essays.

Figure 2 shows that *Pigai* gives a holistic score consisting of four-category descriptors – vocabulary, sentence, structure, and content relevance – and end comments for an overall evaluation of the student's performance. In addition to scores and end comments, *Pigai* is also able to highlight the problems in a student's essay and provide clues for revision. Research suggests that compared to correcting errors directly, locating problems and providing clues can better engage the students in deep processing (Ellis, 2010; Ferris, 2006). Apart from detecting basic grammar issues, the system also offers detailed feedback in other areas such as suggesting synonyms and relevant collocation frequencies from its corpus (Figure 3). These features have been found to be immensely helpful for L2 student writers (Zhang, 2020).

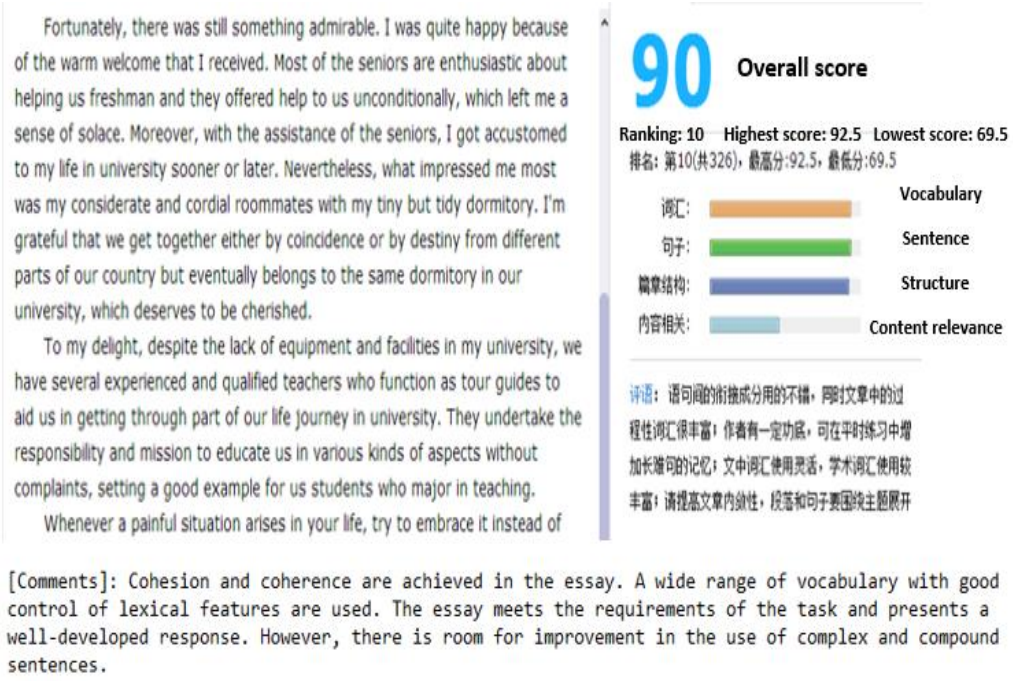


Figure 2. A sample of the score and end comments in AWE feedback

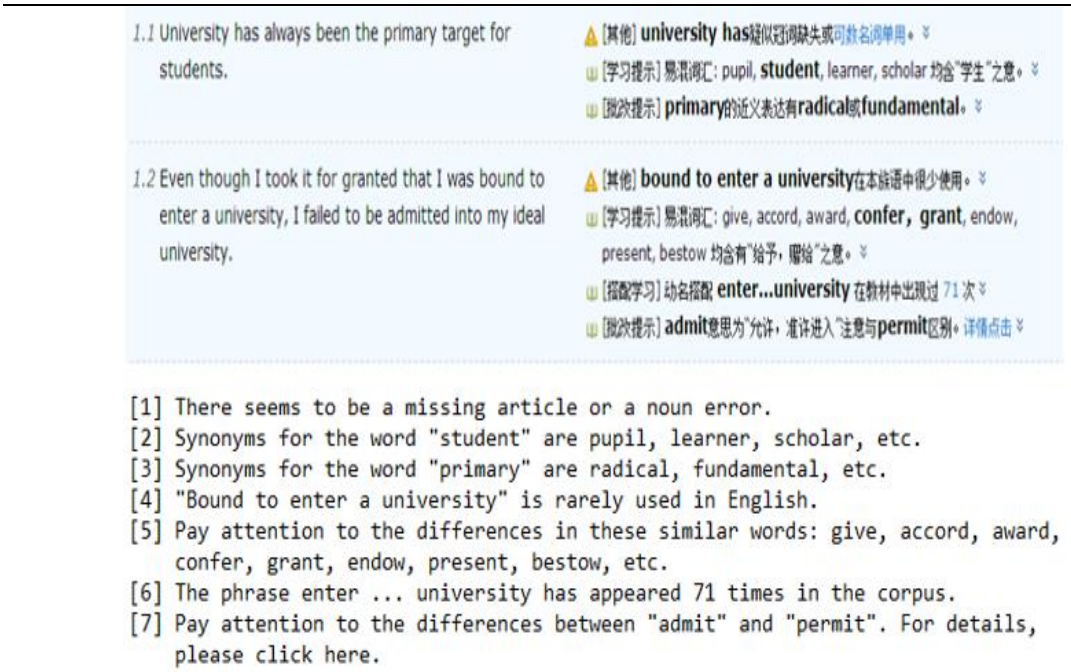
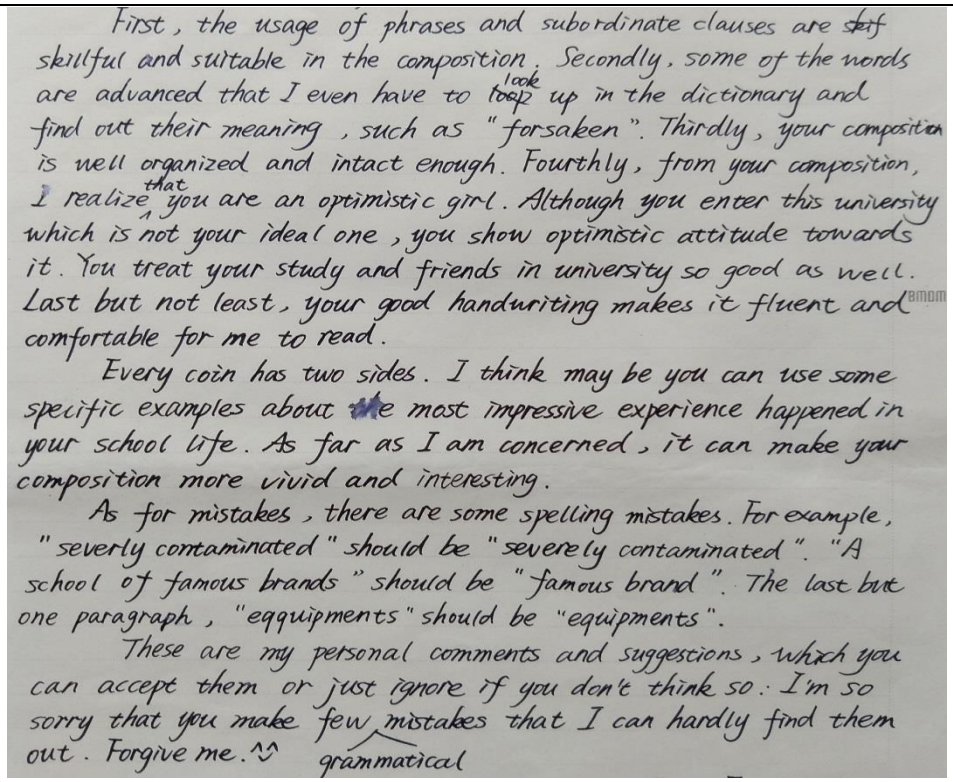


Figure 3. A sample of AWE corrective feedback on student text

The peer feedback in Figure 4 is a typical example and follows the guidelines that Hong gave the students in the first lecture, suggesting that students write in English to

identify strengths and weaknesses and offer suggestions. The reviewer started with positive comments that summarized five major strengths in the writing and ended with suggestions for improvement. We can see that while the reviewer pointed out some errors in the essay, the tone was overall encouraging rather than critical.


First, the usage of phrases and subordinate clauses are ~~self~~ skillful and suitable in the composition. Secondly, some of the words are advanced that I even have to look up in the dictionary and find out their meaning, such as "forsaken". Thirdly, your composition is well organized and intact enough. Fourthly, from your composition, I realize that you are an optimistic girl. Although you enter this university which is not your ideal one, you show optimistic attitude towards it. You treat your study and friends in university so good as well. Last but not least, your good handwriting makes it fluent and comfortable for me to read.

Every coin has two sides. I think may be you can use some specific examples about the most impressive experience happened in your school life. As far as I am concerned, it can make your composition more vivid and interesting.

As for mistakes, there are some spelling mistakes. For example, "severly contaminated" should be "severely contaminated". "A school of famous brands" should be "famous brand". The last but one paragraph, "eqquipments" should be "equipments".

These are my personal comments and suggestions, which you can accept them or just ignore if you don't think so. I'm so sorry that you make few mistakes that I can hardly find them out. Forgive me.^^ grammatical

Figure 4. A sample of peer feedback on a student text

When the students submitted their third drafts to her, Hong provided written comments electronically in Microsoft Word, withholding grades until the students had made their final submissions, a practice that might encourage students to analyse teacher feedback more carefully (Jackson & Marks, 2016). Hong shared her reflections on this integrated approach in the interview:

> It is my impression that students do not always take writing and revision seriously. They feel that they are only writing for their teachers, so they are not actively engaged. Then I read some research articles on AWE and peer feedback and thought these might be useful to motivate them. I thought I might be able to combine them with my feedback, so I tried this. I hoped to

encourage them and at the same time reduce my marking load. I also keep myself updated on the latest feedback research to improve how I give feedback on student writing. (Hong, interview)

Hong saw that having the teacher as the only reader provided little incentive for students to engage and revise. However, influenced by her reading of the feedback research, she believed that involving students to get immediate diagnostic AWE feedback and peer feedback could engage her students and save time on mechanical aspects of marking.

Table 2 shows the types of errors identified by the AWE, peer, and teacher feedback for all 33 students. While we categorised 12 types of error, ranging from spelling to syntax, the error focus differed vastly from each type of feedback. These differences in focus benefited the students' because they received more varied input than they would from a single reader. According to Hong, this exposure enriched their learning experiences and encouraged them to focus on different problem areas at different stages of their drafting.

Table 2. Error focus in three types of feedback

Error focus	AWE	Peer	Teacher
Spelling	23.2%	10.2%	0%
Noun	13.6%	21.9%	0%
Preposition	8.3%	0%	0%
Verb	15.6%	27.3%	0%
Article	9.3%	0%	0%
Pronoun	2.9%	0%	0%
Adjective	4.1%	8.7%	0%
Adverb	2.7%	3.3%	0%
Capitalisation	3.3%	0%	0%
Punctuation	2.4%	0%	0%
Collocation	6.2%	0%	21.7%
Sentence	8.4%	28.6%	78.3%
Total	100%	100%	100%

It is worth noting that, unlike the other two types, the teacher feedback was not primarily directed at error correction. This lack of corrective feedback is unusual in L2 writing classrooms where error hunting is the norm and generally expected. Table 3,

however, shows that the teacher provided substantial marginal and end comments.

Table 3. Feedback categories in three types of feedback

Feedback category	AWE	Peer	Teacher
Direct correction	0%	12.5%	0%
Indirect correction	63.6%	34.9%	4.4%
Marginal comment	19.8%	42.7%	53.8%
End comment	8.3%	9.9%	20.9%
Grade	8.3%	0%	20.9%
Total	100%	100%	100%

Hong's margin comments in Figure 5 are representative of her feedback, challenging the reliability of the information and offering positive reinforcement. While they are brief, the comments draw the student's attention to a problem area unlikely to be detected by an AWE algorithm or peers and encourage the student to keep up the good work. Although AWE programmes can offer immediate diagnostic feedback on grammar and mechanics, they are limited in judging the accuracy of facts. Similarly, peer feedback has numerous benefits, but student reviewers often do not possess the same content knowledge as the teacher. Hong's focus on content thus complemented AWE and peer feedback and encouraged students to engage actively in their revisions.

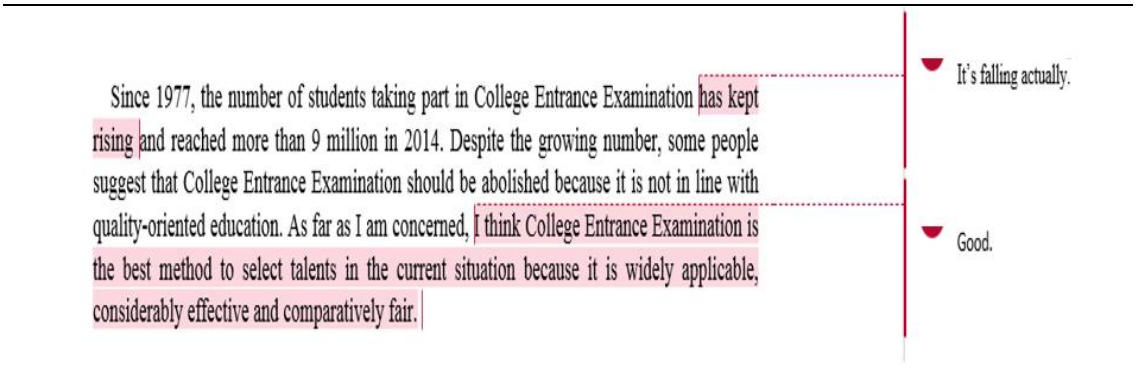


Figure 5. An example of Hong's marginal comments

When asked about her feedback practices in the interview, Hong explained:

> I'm not against error correction, but I'm not a big fan of it either because it's my experience that some grammatical errors can never be eliminated. It's OK for L2 students to have a few errors as long as these don't cause misunderstanding. I'm more concerned about their ideas and logic. They have already had feedback from *Pigai* and their peers so most errors would have been picked up before I check their essays. I see my main job is to go through and check their content. (Hong, interview)

AWE and peer feedback are therefore integral to Hong's feedback practices, both liberating her from time-consuming error correction and encouraging students to self-correct before submitting their essays to her. Her role is markedly different from that of AWE and peers, so by integrating the types of feedback she is able to devote more time to content areas. For the students, they seemed from their interviews to be perfectly content with the three options available, choosing not to look outside these to their friends, family or the internet, for example, for more help.

6 Student engagement with the integrated approach

We examined students' responses to Hong's approach in terms of behavioural, affective and cognitive engagement.

6.1 Behavioural engagement

A key indicator of ***behavioural engagement*** is time-on-task, and we were able to explore this through the data recorded by the AWE system and retrospective interviews with students. 88% of the 33 students submitted to the AWE system more than five times with a mean number of submissions of 9.5 (SD = 4.07), indicating a general willingness to engage with AWE feedback and revise. In the interviews, the students reported that they spent an average of 6.2 (SD = 1.89) hours revising their drafts after receiving AWE feedback. This is more than they reported spending on peer feedback (average of 5.8 hours, SD = 2.4) and teacher feedback (4.7 hours, SD = 2.14). The number of

submissions and the amount of time spent revising suggest that the students showed active behavioural engagement in their revision.

6.2 Affective engagement

Affective engagement was measured through students' emotional and attitudinal reactions in the interviews. 91% of the students in the interviews expressed positive attitudes toward the integration of AWE feedback, citing 'convenient', 'timely', 'effective' and 'helpful' as the main attributes. For example, one female student named Lily explained why she enjoyed the integrated approach:

> I really like this approach because it is very convenient. *Pigai* gives me feedback right when I need it so I can make revisions immediately. It often takes 2-3 weeks before you get an essay back from a teacher, so now I don't need to wait so long. With the *Pigai* feedback, I can revise my essays as many times as I like. The feedback is very helpful, and it makes me try to get better and better scores! When I finally talk to my peer reviewer afterwards, I am much more confident about the essay. (Lily, interview)

The dissatisfaction about typical turnaround times with teacher feedback and the desire to get things right immediately were reported in all 11 students' interviews, which is not uncommon in feedback research (Boud & Molly, 2013; Poulos & Mahony, 2008). The fact that Lily felt more confident about showing her draft to peers after editing in response to AWE feedback reminds us that feedback has a relational dimension. While peer critique is often welcomed for its role in improving their work, students also want positive comments that boost their self-assurance as writers.

Lily's stated engagement with revising was confirmed by data from the AWE system. Figure 6 shows that she spent two days revising her essay, indicating active behavioural engagement.

	Submission time	Score
1	2016-06-07 22:42:37	75
2	2016-06-08 19:04:34	74.5
3	2016-06-09 11:51:59	78.5
4	2016-06-09 11:56:14	82
5	2016-06-09 12:14:00	81
6	2016-06-09 12:17:58	83
7	2016-06-09 12:20:28	83.5
8	2016-06-09 21:56:07	86.5
9	2016-06-09 21:58:42	86.5
10	2016-06-09 21:59:41	86.5
11	2016-06-09 22:56:04	86.5

Figure 6. The screenshot of Lilly's submission record

Affectively, Lily had a positive attitude toward the AWE feedback and felt motivated by the increase in her score from 75 (out of 100) to 86. Cognitively, she was able to make great efforts to address the AWE feedback and revise multiple times. Lily's reference to the immediacy of AWE feedback prompts us to see that students are often frustrated with delays in the return of teacher feedback (Price et al., 2011). AWE systems enable students to get instant feedback, offering real-time diagnosis on their work, and making formative assistance particularly effective, thereby minimising delay and encouraging students to engage in the learning process. We found that 91% of the students reported positive attitudes towards the integration of AWE in their revising processes, suggesting that they were more engaged with the feedback they received.

With regard to peer feedback, 82% of the students approved of including it in the revision process, most of them mentioning 'supportive', 'understanding' and 'less critical', among others. Emily, for instance, talked about why she endorsed peer feedback, together with AWE feedback, in her revising:

It's a good idea to have classmates review our essays after AWE feedback.

> While it is quick, *Pigai* is just a machine. It doesn't give us human support. It's helpful to discuss our essays with peer reviewers and get their views. I think it's easier for them to understand what I mean in my writing, and they are not usually too critical. Also, I can also learn something from reading their essays, like the words and phrases they used and some good ideas. (Emily, interview)

The integration of peer review promoted both affective and cognitive engagement with revision in Emily's case. Affectively, she believed that there was more empathy in the peer group, reducing her apprehension. For her, peer review had the potential to lower anxiety and enhance motivation, thus facilitating affective engagement.

6.3 Cognitive engagement

We addressed cognitive engagement through analysis of the interviews, the students' textual revision operations and by analysing their reflective reports, a task required in the revision process. Figure 7 shows an extract from Emily's reflective report, showing how Emily critically evaluates her essay and diagnoses her problems.

As for the composition, I'm thankful that my reviewer had given me some advice to perfect my article. I must admit that I did make some mistakes in spelling and grammar. I was so careless that I left out some letters in several words and I promise to pay more attention to it so as to avoid misleading the evaluators. Exactly, there exits some grammatical errors, like the misuse of the past tense. For example, Paragraph 3 "Fortunately, all hope is not gone." Here, "is" should be "was", because this happened in the past. Moreover, my composition has a lot of shortcomings that I need to modify. First of all, I'm not good at using professional vocabulary and phrases to polish my articles. In addition, readers may not read it fluently because of the lack of conjunction. Furthermore, I seldom use proverbs or sayings to clarify my ideas. Finally, I think I can't find out something valuable or meaningful in my composition.

To improve my writing ability, I'm intending to read some beautiful articles online so as to accumulate my vocabulary and to beautify my articles. More importantly, I think it is of great help for me to collect some meaningful ideas. Apart from this, I think reading news is absolutely another good way to perfect my composition. Why? Because with my horizon broadened, I can make sense of some events so that I can enrich my knowledge and thus produce valuable articles.

Figure 7. Emily's reflective report

Emily's abilities to identify the errors and weaknesses in her essay and to set goals for improvement show that she was able to analyse and evaluate her writing. The strategic planning and the analysis of her solutions suggest that she was cognitively engaged in her revision process.

Students in most Chinese universities receive product-focused writing instruction and assessment (Zhao, 2010) where formative assessment and redrafting are rare as instruction is geared towards preparing students for examinations (Miao et al., 2006). The introduction of AWE and peer feedback in Hong's class brought something new to the classroom: exposing the students to diverse writing experiences and encouraging them to see that writing is not a one-off task but a process of revising. More importantly, the interaction between the students and the three different types of feedback appears to promote active student engagement in writing and revision.

Clearly, writing a reflective report involves cognitive engagement. However, a more widely adopted way of measuring cognitive engagement with feedback requires methodological triangulation: analysing students' text revisions and retrospective

interviews (e.g., Han & Hyland, 2015; Yu et al., 2019). Table 4 shows all the types of revision operations conducted by the 33 students in their different drafts. It should be noted that there is no requirement for students to address all the feedback they receive.

Table 4. Types of revisions conducted by the 33 students

Revision operations	2nd draft	3rd draft	4th draft
Zero correction	2.6%	2.1%	1.5%
Effective correction	78.3%	43.6%	12.9%
Ineffective correction	3.2%	2.8%	4.3%
Addition	2.7%	10.8%	7.8%
Deletion	2.8%	7.5%	3.6%
Substitution	6.5%	17.9%	6.7%
Rewriting	3.9%	15.3%	63.2%
Total	100%	100%	100%

We found that the students conducted all seven types of revision operations in their drafts, but there were differences in the frequency of each after different types of feedback. For instance, when they received their AWE feedback, the students focused more heavily on addressing errors. After peer review, they paid more attention to substituting words and rewriting apart from attending to error correction. One striking aspect of this table is that, after teacher feedback, there was a substantial amount of rewriting compared with other revision operations. This suggests that many students were able to evaluate their essays and focus on content after receiving teacher feedback. Research shows that revision operations such as rewriting or reorganisation involve more planning and reviewing that require cognitive processing, which is an indication of cognitive engagement (Faigley & Witte, 1981). While Table 4 paints a broad-brush picture of how the students cognitively engaged with writing and revision, we knew little about why they conducted certain revision operations at different points. We then focused on one of the 11 students, Alex, by analysing the textual changes he made in his drafts and asking him why he made certain changes to understand his cognitive engagement.

Figure 8 shows how Alex conducted revision operations in response to AWE, peer, and teacher feedback, indicating changes that go beyond surface edits to rework meaning.

Feedback category	Textual change	Revision operation
Indirect correction (AWE feedback): There seems to be a missing article.	Original: University has always been the primary target for students. Revised: Going to university has always been the primary target for students.	Subtitution
End comment (Peer feedback): I think maybe you can use some specific examples about the most impressive experience in your school life.	Specific example: The most unforgettable experience was when I attended a workshop during the orientation week. In the workshop, some senior students and a teacher shared with us about how to adapt to a new environment and plan our study…	Rewriting
Marginal comment (teacher feedback): It's falling actually.	Original: Since restored in 1977, the number of students taking part in the College Entrance Examination has kept rising and reached more than 9 million in 2014. Revised: Since restored in 1977, the College Entrance Examination has become a life-changing opportunity for many Chinese students. The number of students taking part in the examination reached its peak at 10.5 million in 2008, and the number dropped to 9 million in 2014.	Rewriting

Figure 8. An example of revision operations conducted by Alex

When asked why he made the changes, Alex replied:

> When I saw that there was a missing article in the AWE feedback, I first added 'a'. But when I evaluated the meaning of the whole sentence, I felt it was a bit awkward, so I tried to make further changes. Eventually, I decided to use 'going to university', which can also be a subject… For the peer feedback, I really think that the comment was very helpful. It's true that there were few examples in my essay to illustrate my point, so I followed the reviewer's advice and provided one example… The teacher's comment pushed me to check the accuracy of the figure that I got on the Internet. After double checking the fact, I realised that I made a mistake. So, I decided to rewrite the original sentence and break it into two parts. (Alex, interview)

These revisions and interview excerpts offer us some insight into how Alex behaviourally and cognitively engaged with the three types of feedback. Initially, he only tried to address an error identified by the AWE feedback, but he made a further change after evaluating the meaning of the sentence. When his peer reviewer pointed out that there was a lack of details, he re-examined his essay and responded by providing a specific example to elaborate his point. We can see from this example that the peer feedback complemented the AWE feedback and reminded Alex to focus on content development in his writing. After reading the teacher feedback, Alex assessed the authenticity of the figure in his essay through fact-checking and rectified the problem by rewriting the original sentences. The process of evaluation, examination, and assessment in writing and revision involves cognitive strategies that are important indicators of cognitive engagement (Handley et al., 2011; Winstone et el., 2017).

It should be noted that it is the integration, rather than the individual components, of the three types that seems to facilitate Alex's active engagement. He put it like this:

> The three types of feedback together are much better than a single type because I can concentrate on different parts in my writing at different times. Revising is easier as it is broken into several stages. This is more interesting, so I feel more motivated to revise. I think this integrated approach helps me see revision as an important part of writing. (Alex, interview)

Overall, most of the students appreciated the integrated approach for its contribution to their revision experience, engaging them in the revision process. The integration of AWE and peer feedback with teacher feedback helped the students break down their revision process into different stages where they focused on different areas in their writing. From the teacher's perspective, because of AWE and peer feedback, the teacher was able to make better use of the time she spent on her own feedback, giving more attention to the content and expression of ideas. Together the three types of feedback worked in tandem to effectively promote students' behavioural, affective, and cognitive

engagement in the writing process.

7 Discussion

This study reinforces the view that student engagement with feedback is a complex process (e.g., Handley et al., 2011; Yu et al., 2019; Zhang & Hyland, 2018) as it taps into three dynamically interconnected dimensions. With respect to behavioural and affective dimensions, not only do students need to devote time and invest effort in their writing and revision after receiving feedback, but they must also regulate emotional and attitudinal reactions toward feedback. Perhaps the most difficult part of engagement is its cognitive dimension as it requires students to employ cognitive and meta-cognitive strategies to evaluate feedback on their writing and monitor their revision. How to evaluate written texts, identify problems, and revise can pose tremendous challenges to students.

We believe that the integrated approach in this study played a pivotal role in facilitating student engagement with feedback, writing, and revision. The teacher was aware of feedback research where AWE feedback is found to offer immediate diagnostic assessment and multiple drafting opportunities (Stevenson & Phakiti, 2014), and how peer feedback might reduce writing anxiety and promote collaborative learning (Yu et al., 2019). As a result, she integrated both to create a feedback-and-revision process that made student revision less daunting and more manageable. As illustrated by the students, the complementarity of AWE feedback and peer feedback enabled them to distribute their attention to grammar and content in different drafts.

The integrated approach encouraged the students to focus on local and global areas at different stages of their writing and helped them realise that revision is an integral part of writing. Moreover, the purposeful and systematic combination of AWE, peer, and teacher feedback helped enriched students' learning experiences by offering varied learning modes (human and machine) and diverse readership (peer and teacher). It is important to emphasise the role of teachers in the feedback cycle. As this study shows, the teacher's active involvement in both AWE and peer feedback, by asking students to

focus on improving their scores at the AWE stage and produce a reflective report after peer feedback contributed to students' active engagement through a sense of progress and reflection. Without the final step of teacher feedback, however, the integrated approach would probably have been less effective as many of the students commented on its importance in their writing.

By following a teacher that integrates three types of feedback we have sought to move away from simplistic dichotomies about the 'best' type and learnt that there is no single best approach to written feedback. The integrated approach responds to those who question the legitimacy of computer-generated diagnostics (e.g., Stevenson & Phakiti, 2014; Ware, 2011) by supporting it with peer and teacher feedback. It creates positive synergistic effect that increases student involvement and motivation. Overall, the integration of three types of feedback seems to offer the following benefits:

1. encourage the students to devote time and effort in their writing and revising, which is an effective way to improve their behavioural engagement.

2. reduce the demotivating wait for timely feedback and offers peer support for writing development, promoting affective engagement.

3. require students to analyse, evaluate, monitor, and regulate their writing and revisions, thus drawing on cognitive strategies.

We believe that the integrated approach is not a panacea to poor engagement of some students and that individual factors, such as motivation and language proficiency, can also colour the picture (Zhang & Hyland, 2018). Indeed, there were students in this study that failed to engage and responded with indifference to the multiple feedback types, seeing the revision cycle as overkill and inefficacious. Not all students will be sufficiently incentivised to participate in what might seem a trick to get them to work harder on the same piece of writing. This is one challenge that lies in enacting this approach. However, we believe that enough students were encouraged by the teacher's obvious enthusiasm for the approach, her interest in her students' improvement, and her use of supportive teaching methods to make improvement. Together this meant that the approach, in this situation at least, helped to promote student involvement and address

learners' different needs.

For teachers, promoting student engagement with feedback requires skills and awareness, involving the creation of inclusive and cooperative learning conditions. As shown in this study, the heavy assessment duties and marking load, described by Harland and Wald (2020) as 'assessment arms race', are not uncommon in many higher education contexts across the globe (Boud & Molloy, 2013). The fact that the teacher was able to integrate different types of feedback in her class without major alterations to classroom arrangements shows that her approach is worth exploring in other classrooms where writing, revision, and assessment are important components. Moreover, with growing time constraints, student numbers and pressures on academics to engage in research, administration and outreach, this integrated approach may offer a much-needed solution to student dissatisfaction with their feedback experiences in many parts of the world.

8 Conclusion

Overall, our study shows that student engagement with feedback can be facilitated with an integrated approach and the integration of different types of feedback merits attention from both researchers and practitioners in higher education. We have sought to bring the fields of assessment in higher education and L2 writing together in our study. These are two fields where feedback takes a prominent role. We have done this by tracking changes in student drafts, a method commonly used in L2 writing research but less common in assessment in higher education. Together with self-report data, we hope this has helped to shed some light on student engagement with feedback. The challenges of extrapolating to other classrooms and populations should be recognised and our conclusions seen as suggestive.

We recognise, of course, that a case study has limited generalisability and reflects the thoughts and practices of individuals in one context. It does, however, allow us to explore these thoughts and practices in greater detail to raise important issues which may escape large scale surveys while illuminating points which may be relevant for teachers in other situations. We hope this encourages others to reflect on the possibilities our study

suggests and explore how the use of different types of feedback might promote greater engagement among their own students, adapting the approach to their own classroom context and constraints. We also acknowledge that there is space for future studies to adopt other methodological approaches to measure cognitive engagement through, for example, think-aloud protocols and eye-tracking software.

Most importantly, we argue that student engagement with feedback is a complex issue and that we cannot change students overnight. We can, however, develop inclusive pedagogies and create supportive learning environments that facilitate their engagement in writing and revision. By integrating multiple types of feedback – AWE, peer and teacher feedback – teachers might not only offer students a more varied writing experience that accommodates different learning styles and needs, but also facilitate active redrafting and improved writing through greater behavioural, affective and cognitive engagement. This, then, is an effective means of using assessment to feedforward: turning feedback into learning.

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