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EXPLORING THE COGNITIVE INVOLVEMENT OF EFL STUDENTS DURING THEIR REVISION PROCESSES OF TEACHER FEEDBACK

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ABSTRACT

This study explores the cognitive engagement of intermediate EFL university students with teacher written corrective feedback (WCF) during their revision processes. The investigation focused on three sub-dimensions of cognitive engagement: depth of processing, cognitive strategies, and metacognitive strategies. Data were collected over three months through multiple methods, including the analysis of students' drafts, teacher feedback, stimulated recalls, and semi-structured interviews. Findings revealed five levels of depth of processing (unconscious disregarding, intentional neglecting, noticing, inaccurate understanding, and accurate understanding), highlighting variations in how students processed feedback. Cognitive strategies, such as reasoning and memorization, and metacognitive strategies, including planning and reviewing, were identified as critical components of engagement. The interplay between cognitive and behavioral engagement was also observed, particularly in students' use of external resources for reviewing drafts. While personality traits and proficiency levels influenced engagement, the findings emphasized the complexity and multidimensional nature of learner engagement with WCF. Limitations include the short research period and a homogeneous sample. Future research could explore engagement over a longer duration and across varying proficiency levels to yield deeper insights.

KEYWORDS: *Teacher Written Corrective Feedback, Cognitive Engagement, Depth of Processing, Cognitive Strategies, Metacognitive Strategies, Second Language Writing, Efl Students*

1.INTRODUCTION

The adaptation of teacher written corrective feedback has been popular among both teaching teachers and researching scholars (Moser, 2020). For the most of writing teachers, when they want to correct errors on their students' drafts, one of the most preferred methods is the delivery of written feedback, since it could be delivered conveniently. For the scholars working on the field of second language writing, they have long been focusing on the effectiveness of teacher written corrective feedback because of its prevalence and usefulness. Furthermore, the number of research started to plumet since Truscott (1996) started to question the effectiveness of written feedback on students' writing performance. Much effort has devoted to explore the types of teacher written corrective feedback, the comparisons between or among different feedback methods, and how to improve the effectiveness of teacher feedback (e.g. Sheen, 2010; Yoo, 2009).

While the findings concerning the effectiveness of teacher corrective feedback was controversial, the definition of this specific type of feedback has reached consensus. For most scholars, corrective feedback was also named as grammatical feedback, linguistic feedback or written error feedback. It refers to the written forms of feedback provided by the teachers on the students' writing texts (Lee, 2013). No matter the students are first language learners or second language learners, or regardless of the context of ESL or EFL, the usages of teacher written corrective feedback are prevalent. However, one of the most serious problems concerning writing teachers are that they have always discovered their students repeating the same mistakes on their writing texts, even when the errors were pointed out by the teachers repetitively (Yu, Jiang & Zhou, 2023). This led to frustration to most teachers since the provision of written corrective feedback on each student's written work has not been an easy task, as it requires a significant amount of time and efforts.

As mentioned before, a lot of studies have been done in the field of teacher written feedback. Most of them concentrated on exploring what factors contributing to a higher level of effectiveness generated by teacher feedback. While these discoveries have shed light on the importance of written corrective feedback, these studies were conducted based on the hypothesis that the student participants were passive learners that showed no activeness in the learning process (Zhang & Hyland, 2022). However, in actuality, students play a crucial role in engaging with each learning process, and it is sometimes the level of engagement that contributes to the learning performance and results. It is, therefore, essential and necessary to design further research directed towards exploring corrective feedback from the students' perspectives. One of the ways to examine a learning activity from the students' perspectives is to look at how students cognitively process a teacher practice. By conducting research in this way, findings are expected to provide new

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insights to understand a teaching method (Polio, Fleck & Leder, 1998).

Therefore, the current study was designed to explore how undergraduate students cognitive engage with their teacher's written corrective feedback from a context of authentic classroom. Purposive sampling will be used to target suitable writing teachers and also student participants.

2.LITERATURE REVIEW

Teacher written corrective feedback (WCF), which was a term used to describe linguistic feedback provided by the language teachers on their students drafts, has been a popular and universal teaching methods to help language students improve accuracy on their written work. Since it has been used internationally and frequently, the feedback approach has generated considerable discussion in the academic literature (e.g. Bitchener, 2008; Ferris, 2006, 2010; Truscott, 2007).

After his argumentation, subsequent studies have been conducted to evaluate this conclusion, which proved that teacher WCF have been beneficial for both the students' revisions as well as their subsequent writing performance (Bitchener, Young & Cameron, 2005; Van Beuningen, De Jong, & Kuiken, 2012). This growing body of research has led to a focus shift from exploring whether WCF was effective to what types of WCF were more effective. For example, there were comparisons between indirect feedback and direct feedback (e.g. Kubota, 2001). Additionally, there were other studies focusing on whether the scope of feedback influenced its effectiveness, such as a comparison between comprehensive feedback with focused feedback (e.g. Ellis, Sheen, Murakami & Takashima). While these studies provided exciting findings concerning the effective feedback, they were often conduced based on the assumption that the students were passive receivers. Therefore, more studies are needed to explore teacher WCF from the students' dimensions, to see how students, as active participants, engage with teacher feedback for revisions.

While the importance of learner engagement has been acknowledged in recent years, there is still a lack of research focusing on this concept. According to Ellis (2009), one of the dimensions in student engagement concerns the students' cognition. It refers to the degree of cognitive investigation students exhibit when processing teacher feedback. To be specific, it involves the depth of processing, the cognitive strategies and metacognitive strategies utilized during the students' revision process. In terms of the depth of processing, it refers to the different cognitive levels at which students notice feedback, such as merely noticing the feedback or understanding the feedback (Qi & Lapkin, 2001). Additionally, the cognitive strategies pertain to how students allocate mental resources and proactive thinking regarding the reactions to feedback. Metacognitive strategies, on the other hand, involve how students monitor and regulate their mental effort throughout the revision process (as illustrated in Table 1).

Table 1: the Modified definitions of students' cognitive engagement with teacher written corrective feedback

Learner engagement	Sub-dimensions	Explanations
Cognitive engagement	1)Student's depth of processing	The extent to which students involve in a detailed and elaborate mental analysis when responding to teacher written corrective feedback
	2)Students' mental effort in using cognitive strategies	The amount of mental effort and concentration that students invest when they apply specific cognitive strategies consciously or unconsciously to process teacher written corrective feedback
	3)Students' mental effort in using metacognitive strategies	The degree of cognition and mindfulness that students invest when they apply specific metacognitive strategies consciously or unconsciously to monitor and regulate their cognitive effort

3.METHODS

3.1 Participants and Research Context

Five intermediate year-two students minored in English were chosen from a university in the northern part of China. Their ages were ranging from 19-20, and they all volunteered to participate in the current research after a detailed explanation of the study. Besides their willingness to participate, the selection criteria also included: the ranking of their average writing scores from their previous writing tasks and the Teacher A's recommendation. In sum, their selection criteria were three-fold. To understand more clearly, there were 30 students in Teacher A's class.

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To protect their privacy, these students will be referred to Student A, B, C, D, and E. To ensure that they obtained the degree of English as their second degrees, they were required to attend all the English-related courses. The table below furnished more background information of the student participants.

Table 2: The Detailed Information of the student participants

Name	Age	Gender	Major	Ranking in year-1 writing performance
Student A	19	Male	Law	14
Student B	19	Female	Japanese	15
Student C	20	Female	Applied statistics	16
Student D	20	Female	Applied statistics	17
Student E	19	Female	Biological science	18

The current course the students took was *English Writing (Level 1)*. Their teacher, Teacher A, was purposively chosen since he was the only teacher at the Department of English that adopted process writing. When I realized that his usage of feedback approach suited my study, I approached him right away and explained my study to him. I specifically highlighted that there would be no intervention introduced to his class and no teaching methods needed to be modified during the research. After serious consideration, Teacher A decided to participated in.

Teacher A held a Doctoral degree in Linguistics and had more than five years' teaching experience. In fact, he has been teaching the course of English Writing since he first entered the University. In Teacher A's class, he required his students to submit two writing homework with two drafts.

To be specific, unlike the majority of the teachers at the same apartment that only required their students to write a draft and provided no feedback, Teacher A focused more on how students utilized his feedback to make revisions. Therefore, in his class, his students needed to submit a first draft, wait for the feedback, and make revisions based on their teacher's feedback. This approach allowed me, the researcher, to have access to exploring the processes where students took advantage of teacher feedback for revisions.

Teacher A explained that he believed that only by asking his students to write a task without providing any feedback was useless. In addition, it was again useless to provide feedback on students' drafts and require no revisions. He commented:

> *During my first few years of teaching, I have spent a lot of time and effort in the provision of detailed grammatical feedback, since all my previous teachers used to do that. I remembered that as a student, when I received the feedback from the teacher, I would treat it carefully, regardless of whether a revision was required or not. However, during my five years of teaching, I realized that nowadays the students are different, I can say, they are somewhat lazier than us. So, for me, to make my feedback more efficient, I need to require them to go through my feedback, and write another draft based on what I have provided.* (1st interview)

Due to the teacher's own learning and teaching experience, he firmly believed the effectiveness of multiple drafts and adopted this feedback approach in his class, which allowed me to collect data suitable for answering my research questions.

3.2 Data Sources and Collection

Over the period of the academic year from March 2023 to June 2023, the student participants took the course of *English Writing (Level 1)* taught by Teacher A. During the three months, the students learnt basic writing concepts, such as punctuation, grammar, writing genre, and basic writing structure. Especially, Teacher A focused on improving the students' argumentative writing skills, since all students prepared to take the College English Test Band 4 and College English Test Band 6, where the writing genre were mostly argumentation. Over the course, the students were assigned two untimed writing tasks.

To achieve both the validity and trustworthiness of the research, data triangulation was taken into consideration (Ayton, Tsindos & Berkovic, 2023). A variety of data sources were collected, including students' writing drafts, the teacher's written corrective feedback, stimulated recalls done by the students and semi-structure interviews with both the students and the teacher. The variety served as to validate the results and cross-check the findings, thus to ensure a more well-rounded and credible interpretation of the data.

For the students' writing drafts, since each student needed to write a first draft and a second draft based on the teacher feedback, this meant that overall, 20 (2*2*5) writing drafts were collected and analysed. In addition, the corresponding feedback was also explored to see whether the feedback type could influence students' engagement level. When the students received teacher corrective feedback on their first drafts, each student needed to make an individual appointment with the researcher for his/her revision. Then,

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the student and the researcher met at the quiet tutorial room where the student started to revise his/her writing drafts. The students were allowed to bring everything they might need for revisions, such as their textbooks, their notebooks and/or laptops. After completing their revisions, the students carried out verbal reports where the researcher pointed to each instance of teacher corrective feedback, prompting the students to explain how they understand the teacher feedback, and what cognitive and metacognitive strategies they have employed during revision.

Two semi-structured interviews were carried out with Teacher A and his six students at the beginning and the end of the study. The first interview with Teacher A aimed at gathering background information regarding his teaching experience, approach to feedback, and understanding of student learning needs. This initial interview aimed to provide context for the study and explore the teacher's pedagogical methods. The second interview with Teacher B centred on his experiences with students' use of written corrective feedback during the research period, including how students typically responded to his feedback and the impact he observed on their writing revisions. It also delved into Teacher B's reflections on the effectiveness of his feedback strategies. Both interviews were conducted in a semi-structured format, allowing for in-depth exploration of each teacher's perspectives, and were audio-recorded with their consent.

As for the interviews with the students, the first interview focused on exploring the students' educational backgrounds and their prior experiences with teacher feedback. This provided the researcher with an initial understanding of the students' feedback perceptions and expectations. The second interview, conducted at the end of the study, sought to explore the students' reflections on their overall cognitive experiences with teacher feedback.

Each interview lasted for about 25 to 35 minutes and was audio-recorded with the students' consent. The students all used their first language (i.e. Chinese), to produce a more detailed and accurate expression of their thoughts. The semi-structured interview was used since it was particularly effective in exploring students' learning process (Ayton, Tsindos & Berkovic, 2023). Table 3 illustrated the timeline for data collection.

Table 3: An overall timetable for the data collection

Week	Data sources
Week 1	Getting in touch with the potential students and the teacher
Week 2	First Semi-structured interviews with both the students and the teacher
Week 6	First writing task (Students handing in their first drafts)
Week 7	1. Provision of teacher written corrective feedback 2. Submission of students' second drafts 3. Students' stimulated recalls
Week 12	Second writing task (Students handing in their first drafts)
Week 13	1. Provision of teacher written corrective feedback 2. Submission of students' second drafts 3. Students' stimulated recalls
Week 16	Second Semi-structured interviews with both the students and the teacher

3.3 Data Analysis

It has been established in previous studies that the type of corrective feedback can have an impact on students' cognitive processing levels (Fan & Xu, 2020). Accordingly, teacher feedback in the present study was categorized into direct and indirect feedback, based on Ellis' (2009) classification.

Teacher WCF, along with the students' writing drafts, underwent a careful examination, with a particular focus on the students' mental processing levels during revisions. While pointing to each feedback, the students needed to explain how they understood the teacher feedback and why they made such as revisions. This particular analysis provided valuable insights into how students interpreted and cognitively engaged with the feedback, whether they understood it at a superficial level (e.g., only noting the feedback) or at a deeper cognitive level (e.g., providing accurate metalinguistic explanations). Additionally, it also explored how different levels of mental engagement influenced the effectiveness of their revisions.

Different from prior studies done by Qi and Lapkin (2001) that only identified the students' depth of processing as either noticing or understanding, the current study discovered five types of mental processing levels: unconscious disregarding, intentional neglecting, noticing, inaccurate understanding and accurate understanding. Table 4 provided more detailed explanation on these five types of depth of processing:

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Table 4: Types of depth of processing of teacher written corrective feedback

Depth of processing	Explanations
Subconscious disregarding	Students unconsciously forgot the make corrections according to feedback, thus leaving the feedback unattended
Intentional neglecting	Students deliberately ignored teacher feedback, thus making no revisions
Noticing	Students noticed the teacher feedback, but could not provided explanations of the feedback
Inaccurate understanding	Students provided inaccurate or partially accurate explanations of the feedback
Accurate understanding	Students provided accurate explanations of the feedback

According to the conceptual framework of cognitive engagement (i.e. Table 1), students' cognitive engagement included both the depth of processing and their mental effort in using cognitive and metacognitive strategies. Regarding the latter parts, since limited research has focused on these dimensions of cognitive engagement, the findings were grounded in the current data from semi-structured interviews and stimulated recalls. In total, 10 stimulated recalls (5 students * 2 writing tasks) and 10 interviews (5 students * 2 interviews) were conducted with the students. These data were transcribed verbatim to ensure a complete and accurate record of the participants' responses. Following transcription, the data were translated into English. The translation process was carried out with a focus on preserving the original meaning, ensuring that any cultural or linguistic nuances were appropriately conveyed in the English version (Flick, 2007).

The transcripts were carefully cross-checked by the student participants and the teacher participant to ensure that no misunderstandings or inaccuracies occurred. This step was essential to verify that the participants' responses were faithfully transcribed and that their intended meaning was accurately reflected. Any ambiguities or misinterpretations were clarified through this review, ensuring the data's reliability for further analysis (Flick, 2007).

As starter, a detailed selection process was carried out, retaining only those data segments that pertained to the different aspects of student engagement. The data were then stratified according to the three sub-dimensions of cognitive engagement (i.e. depth of processing, adaptation of cognitive strategies and adaptation of metacognitive strategies). This process of categorization was critical, as it allowed for a more precise and systematic examination of the different layers of cognitive engagement (Benson, 2013).

In the final phase of the analysis, cross-case comparisons were applied to uncover recurring or analogous themes across various cases (Benson, 2013). This comparative technique allowed the researcher to detect overarching patterns and commonalities, which were crucial for understanding the broader phenomenon of cognitive engagement with WCF.

To ensure the reliability of the data analysis, another colleague, holding a Doctorate degree in Education, was recruited as an additional coder to independently code 30% of the students' writing drafts, semi-structured interviews, and verbal reports. The initial inter-coder agreement rate was about 80%, and following two rounds of discussion to resolve discrepancies, the agreement rate was raised to 100%, thereby enhancing the validity of the coding procedure.

4.FINDINGS

According to the engagement framework, students' cognitive engagement could be understood as the students' depth of processing, their mental effort into adopting cognitive strategies, and their mental effort into utilizing metacognitive strategies (Ferris, Liu, Sinha & Senna, 2013). However, since existing studies have indicated that the types of teacher feedback may influence how students cognitively engaged with feedback (Kahu, 2013), the following section thus began by introducing the common patterns regarding the explicitness of teacher written feedback, and then was followed by a detailed explanation of the three sub-dimensions of cognitive engagement.

4.1 Number and the explicitness of teacher written corrective feedback

Regarding the number of written corrective feedback (WCF), Teacher A delivered 89 feedback points. On average, he provided 17.8 grammatical feedback to each student. As shown in Tabel 5, detailed information was provided on the number of feedback points delivered on each student's first draft.

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Table 5: WCF on two writing drafts received by each student in Chole's class

Student	Total WCF points
Student A	18
Student B	16
Student C	19
Student D	17
Student E	19
Total	89

Regarding the explicitness of WCF, most previous studies have classified corrective feedback into two main types: direct or indirect feedback. Table 6 illustrated what did it mean by direct and indirect feedback.

Table 6: Definitions and examples of direct and indirect feedback

Feedback type	Definition
Direct feedback	Direct feedback referred to explicit corrections provided by the teacher.
Indirect feedback	Indirect feedback indicated the provision of hints or cues that guide the student to recognize and correct errors independently. Specific forms included underlining, circling and underlining with a question mark.

Agreeing with the prior findings, Teacher A also delivered these two types of corrective feedback. According to Zheng and Yu (2018), the participant teacher in their study delivered 65.22% of direct feedback and 34.78% of indirect feedback. The current study discovered that less direct feedback was delivered than that in Zheng and Yu's study. One possible reason was that in their study, they focused on low-proficiency students while the current study included intermediate students.

4.2 Students' Depth of processing

Different from previous studies that only summarizing depth of processing as noticing and understanding, the current study discovered five levels of depth of processing: unconscious disregarding, intentional neglecting, noticing, inaccurate understanding and accurate understanding.

Unconscious disregarding happened when the students admitted that she/he forgot to make corrections based on teacher WCF. For example, the teacher added "can" after the word "I" in Student B's sentence "As far as I see, it is natural understandable...". Student B commented this feedback:

> *Oh, I think I just did not notice it jut now. Because when I revised, I just read through my draft. Maybe I think that my original sentence (i.e. as far as I see) is quite smooth, so I hasn't paid too much attention*. (2nd stimulated recall)

Comparative to this unintentional action, some students demonstrated deliberate ignoring of teacher feedback. For example, Student C commented on the following teacher's feedback:

First draft: In summarise, it is apparent that…
(WCF: In brief/In summary)

> *I have noticed this, but I have not made any revisions. Since I think both phrases are accurate, and the teacher just provides me an alternate choice*. (1st stimulated recall)

However, when the researcher asked further question about whether he noticed the difference of spelling between "summary" and "summarise", Student C suddenly realized the error:

> *Oh! The word "summarise" is a verb. I think I hasn't realized this before. I am too careless!* (1st stimulated recall)

So, for Student C, her demonstration of a lower level of processing was resulted from her own personality, rather than her English proficiency level, since with further questions, she could have provided accurate understanding.

In terms of accurate understanding, most students can accurately understand some of the feedback points, especially when the feedback was provided directly. Below was an example from Student D:

First draft: I think such behaviour is understandable but <u>is not</u> recommendable.

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(WCF: repetitive, you can use "by no means")

> *I think this feedback is extremely useful, since I always use this sentence pattern. However, since my prior writing teacher has not provided any feedback, I have not realized that this kind of writing is not very good. Here, the teacher feedback means that my sentence is repetitive, since there are two "is" in the sentence. Also, I think it is considerate for the teacher to provide an accurate form*. (1st stimulated recall)

For Student D, direct feedback proved to be effective in helping her revision. Also, she showed accurate understanding of the feedback by indicating that what was wrong with her original draft. In addition, she also indicated that she utilized cognitive strategies for this feedback, which will be analysed in Section 4.3.

As for partial understanding, it happened when the students could only provide partial reasons for the feedback. For example, student A provided explanations on the following feedback:

First draft: Many advocate that taking holiday during the students' semesters should be avoided, I believe it's better to include short-time holidays in the students' semester to help them relax.
(WCF: While many advocate that taking holiday during the students' semesters…)

> *Here, the teacher added "while" at the beginning of the sentence, I think it is accurate, because in my original draft, there is a comparison. I compare what others think to what I believe, so "while" should be used as an indication of different opinions*. (1st stimulated recall)

However, when the researcher asked another question about whether he thought his original sentence was complete or not, he displayed uncertainty by saying "well, now I have read it again, I think it is not very fluent. The teacher's version sounds better."

So, based on Student A's explanation, he understood the teacher feedback based on his writing content. However, he has not realized that his original sentence was incomplete, and that is the underlying reason why the teacher added a conjunction to his original sentence. Thus, this instance was an illustration of "inaccurate understanding".

4.3 Students' usage of Cognitive Strategies

In terms of cognitive strategies, it referred to the mental effort students exert to actively process, analyse, and organize information in order to enhance their understanding and retention of the material. To be specific, some of the students exhibited memorizing and reasoning as their cognitive strategies.

In fact, reasoning was closely related to the students' depth of processing levels. When the students' reasoning was accurate, their depth of processing levels was also higher. When the students could not provide any specific reasonings or only part of the reasonings, their depth of processing was comparatively lower.

In addition, the current study also discovered a new type of cognitive strategy, which was memorizing. For some students, they processed their teacher feedback at a deeper level, by memorizing the accurate forms. As mentioned in Section 4.2, the teacher corrected Student D's original version from "I think such behaviour is understandable but is not recommendable" to "I think such behaviour is understandable but by no means recommendable". After she provided accurate understanding of the grammatic rules underlying the teacher feedback, Student D kept on commenting how she would use this feedback:

> *I think this sentence could be used in my future writing. So, after correcting this error, I spend several seconds to memorize this phrase. I originally designed to write it down, but since I forgot to take my notebook with me, I decided to firstly memorise it. Oh, I know, I can use my phone!* (Then she asked whether she can use her phone to memorize this phrase again) (1st stimulated recall)

Student D's example was inspiring since it provided two insights. For some students, they exerted more cognitive effort in utilizing the teacher feedback, in the form of mental memorization. By committing the feedback to memory, this form of cognitive engagement allowed them to process the feedback more actively, ensuring that they retained the corrections for future reference and incorporated them into their writing practices. Secondly, while the current study centred on students' cognitive engagement, the data revealed that sometimes cognitive engagement and behavioural engagement was interrelated. Students' cognitive engagement, such as their mental effort in processing teacher feedback, could sometimes be observed through actions like using their phones to take notes or reviewing materials related to their feedback. This interplay between cognitive effort and observable actions underscores the complex nature of student engagement, where mental processes are often accompanied by visible behaviours.

4.4 Students' usage of metacognitive strategies

According to Oxford (2017), metacognitive strategies could be understood as the methods or strategies students implement consciously or unconsciously for the aims of planning, monitoring and evaluating their learning and cognition. These strategies

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enable learners to gain greater control over their cognitive activities, helping them assess the effectiveness of their approaches and adjust their learning strategies accordingly to enhance understanding and performance.

Previous literature has provided scant evidence regarding how students adopted metacognitive strategies in their revision processes, the current study offers promising evidence. Two types of metacognitive strategies were found from the data: planning and reviewing. Hald of the students reported making plans before revisions. For example, Student C mentioned in her stimulated report:

Well, before revision, I spend several minutes on thinking about what aspects I should focus on. Then I decided to firstly revise easier errors, such as spelling and plural forms. Then I focused more on correcting the word choice problems. Student E also reported making plans before revision. However, her focus was contrary to Student E's plan, since she decided to focus more on more difficult feedback:

> *For me, I skim the feedback firstly and then decide to correct the feedback that has confused me first. Because I think that resolving the more complex issues first allows the remainder of my revision to proceed more smoothly. I don't want to finish my revision still grappling with feedback that I'm unsure how to address*. (2nd verbal report)

As for reviewing, all the students demonstrated their engagement in this specific strategy. To be specific, all of the students reported checking their completed drafts once again before submission. However, how they reviewed varied among students. Three participants indicated that they used *Pigai*, an online writing evaluation platform, to evaluate their revised drafts.

For the other three students, two reported rereading carefully the revised drafts before submission to catch any overlooked errors, while the remaining student described reviewing her draft by simply skimming through the finished draft. This diversity in reviewing strategies reflected that even for the same metacognitive strategies, there were still different levels of engagement, which emphasized the importance to explore the students' learning process, rather than their learning outcomes.

5.DISCUSSION

The study revealed that, in addition to proficiency levels, students' personality also played a significant role in how they cognitively engaged with teacher WCF. For example, while Student C could have provided accurate understanding of a certain feedback point, she chose to ignore the feedback because she was too careless to notice the difference between teacher feedback and her own writing. This observation suggested that personality traits, such as attention to detail, may influence how students process and engage with feedback (Ellis, 2009).

Additionally, Student D's case indicated that the multiple dimensions of learner engagement was interrelated, at least at the dimensions of cognitive and behavioural. Furthermore, the students' metacognitive strategies in reviewing also indicated the interplay between cognitive and behavioural engagement (Fan & Xu, 2020). While some students reviewed their drafts by skimming the text, other students took advantage of the external resources such as online writing evaluation platform.

In addition, the same metacognitive strategy could also demonstrated different levels of engagement (Zheng & Yu, 2018). For example, when students chose to review their drafts by simply skimming, their engagement levels were lower, since this method required less cognition. Comparatively, when students demonstrated their attempt to look for external resources to help their reviewing, it indicated a higher level of metacognitive levels.

6.CONCLUSION

The current multiple case studies explored how intermediate university students engaged cognitively with teacher written corrective feedback. In sum, each student engaged with WCF among the three sub-dimensions of cognitive engagement, namely the depth of processing, the adaptation of cognitive strategies, and the utilization of metacognitive strategies (Kahu, 2013). In terms of the depth of processing, five levels of depth of processing were identified: unconscious disregarding, intentional neglecting, noticing, inaccurate understanding and accurate understanding. The current study found that even for some of the direct feedback, students might still intentionally or unintentionally ignore them. In addition, even the focus of the study was intermediate students, it showed that all of them acquired certain English knowledge, since all of them could provide metalinguistic reasons for certain feedback points.

Regarding the adaptation of cognitive strategies, evidence showed that some students adopted memorizing and reasoning as their cognitive engagement. To be specific, some students devoted mental effort into committing several feedback points to memory, in case the feedback could be suitable for future usages. The study contributed to the current research by discovering that students also adopted metacognitive strategies during their revisions.

Specifically, planning and reviewing were the two main metacognitive operations. For some students, they did not just jump into

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reviewing their drafts upon receiving teacher feedback. Yet, they paused for some minutes to make plans, in order to decide what kind of errors they should priories in their revision. This differed from the findings from Zheng and Yu (2018), which reported limited metacognitive strategies among their students. One of the possible reasons were the students' proficiency levels. Since the current study recruited intermediate rather than low-proficiency students, they might have more learning experience and cognition span when processing feedback, thus it allowed more room for cognitive operations (Ferris, 2010).

One of the limitations of the study were that it only included a research period of three months. This shorter research period made it difficult to detect whether there are any changes in the engagement levels. In addition, the current study has already proved that students' proficiency levels could influence their engagement levels. Thus, future research could be conducted within a longer research period and include students with different English proficiency levels.

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