Undergraduate Writers' Experience with Two Peer Feedback Tools

by

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Abstract

The essay assignment has been commonly used in a wide range of courses in higher education to facilitate student learning of subject-specific knowledge. However, undergraduate students do not always fully benefit from essay assignments. Assisting students' revision of their essay drafts with peer feedback is a growing instructional practice that is thought to enhance learning outcomes. Although research evidence mostly supports the effectiveness of peer feedback, there is uncertainty about which peer feedback procedures return the greatest benefits. To investigate designs with potential to improve the peer feedback experience for writers, the effects of two intervention tools were explored: (a) a *Prior Question Tool* which enabled the writer to request specific types of feedback from the reviewer (b) a *Helpful Feedback Survey and Sharing (HFSS) Tool* which allowed writers to nominate for distribution the feedback comments that they found most helpful. Data were gathered from 31 undergraduate students taking an educational psychology course that featured a series of three peer reviewed essay assignments. Types of feedback seen as helpful by writers and constructed by reviewers were identified. Writers' use of feedback was observed, and students' attitudes toward the peer feedback experience were examined. Students' adherence to the instructions was also analyzed. Three different methods were used to answer these research questions: comment analysis, case study, and quantitative description. The results indicated that writers preferred feedback that identified problems, suggested action, and addressed topic-related issues. They were more likely to act upon these types of feedback during the revision process. However, in-depth analysis indicated that writers did not necessarily adopt feedback of the type they requested. The results also showed that reviewers constructed problem-identifying, directive, and topic-related feedback more than other feedback types. Students tended to report positive attitudes toward the peer feedback experience. Most requests writers made via the *Prior Question Tool* were addressed by reviewers. While reviewers did provide feedback directly in response to the writers' requests, they more often constructed feedback autonomously. Most reviewers fully utilized the *Prior Question Tool*, but the majority of writers did not.

Keywords: Peer feedback; Essay assignment; Undergraduate; Revision

To my beloved mother.

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Chapter 1.

What Do We Need to Know about the Experience of Receiving Peer Feedback?

My interest in peer feedback developed while I was working as an educator and studying as a graduate student in an Educational Technology and Learning Design program. I became interested in identifying, designing, and assessing interventions to help struggling students maximize their learning of disciplinary-specific content knowledge.

According to a definition provided by Definition and Terminology Committee of the Association for Educational Communications and Technology (AECT) (2007), "[e]ducational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (p. 1). The key role of educational technology designers is, therefore, "facilitating learning and improving performance" of learners. AECT refers to learning as deep learning, which implies "different instructional and assessment approaches than surface learning" (p. 6), and performance as "the learner's ability to use and apply the new capabilities gained" (p. 7). AECT particularly emphasized a shift of the learner's role—from a recipient to a constructor of knowledge.

To research and design ways of facilitating deep student learning and performance, I chose to focus on peer feedback of essay drafts. Formative assessment of essays is an appropriate research subject because essay assignments require students to engage with learning materials and reflect on their understanding of concepts and knowledge introduced in a course (McCune, 2004). Moreover, feedback, as one of the powerful intervention strategies for learning improvement (Hattie & Timperley, 2007), can provide a number of benefits to students. Therefore, for my thesis research, I chose to study peer feedback in an essay assignment that was part of an undergraduate course in instructional psychology. I modified the design of the assignment to incorporate two peer feedback tools that students could use during the assignment.

1.1. Essay Assignments Facilitate Discipline-Specific Learning

Essay assignments are commonly used in higher education (Hounsell, 1997; Scouller, 1998) across a range of courses encompassing the humanities, social sciences, applied sciences, and natural sciences. One of the purposes of integrating essay assignments across such a diverse array of subjects is to promote learning of course concepts. The writing to learn approach facilitates students acquiring knowledge of concepts through the writing process (Broadhead, 1999). The approach also helps students to realize what they were confused about or what knowledge they were missing and guides them to connect those concepts with their existing knowledge and build new knowledge (Dunn, Saville, Baker, & Marek, 2013). Writing to learn has conclusively shown positive effects on acquisition of subject knowledge (e.g., Bangert-Drowns, Hurley, & Wilkinson, 2004; Graham & Hebert, 2011). Writing, as a learning tool, assists students via several cognitive processes (Bangert-Drowns et al., 2004; Klein, 1999; McCutchen, Teske, Bankston, & Bazerman., 2008). Perhaps most notably, writing about a subject repeatedly prompts students to return to sources to develop understanding of course concepts by making connections among them and to prior knowledge (Bangert-Drown et al., 2004).

Attending to the discipline-based nature of an essay assignment was judged to be particularly important for this thesis research. In the class taught by the cooperating instructor, students' experiences of peer feedback took place entirely in relation to a specific type of essay writing assignment intended to enhance and provide a context for assessing their understanding of educational psychology concepts.

While the positive effects of essay assignments on students' learning have been acknowledged, the magnitude of their effect size is not large (d = 0.26 to 0.50) (Bangert-Drowns et al., 2004; Graham & Hebert, 2011). Students with lower reading and writing abilities may not fully benefit from learning activities that involve writing (Hayes, 2000; Patchan & Schunn, 2016). To assist those students, many intervention strategies have been introduced (Duijnhouwer, Prins, & Stokking, 2012), one of them being assisting the revision process. The revision process not only improves writing quality but also assists students in developing cognitive and linguistic skills (Bridwell, 1980). However, revision

does not always lead to better learning outcomes since it is complex and affected by diverse factors (Faigley & Witte, 1981).

One way to help students with revision is to give them suitable feedback. Feedback is considered a powerful teaching and learning strategy (Hattie & Timperley, 2007) and a central (Sadler, 2010) element in instructional design, particularly for undergraduate students who are less experienced and/or skilled as writers (Bridwell, 1980; Hayes, Flower, Schriver, Stratman, & Carey, 1987; Perl, 1979; Sommers, 1980). Much previous research has established a positive effect on learning from feedback (Butler & Winne, 1995). When feedback is employed with a formative approach in essay assignments, it helps students raise the quality of revisions and devise appropriate revision strategies (Beason, 1993).

1.2. The Benefits and Challenges of Feedback

Feedback has been found to be one of the most influential factors determining students' learning achievement (Hattie & Timperley, 2007). Feedback can take various forms, such as a score on an exam or a problem identified in a performance (Hyland, 2000). In my research, feedback refers to written comments about a draft of an essay. While the importance of such feedback has been acknowledged, particularly in formative assessment, existing research recognises that students do not necessarily use feedback (Jonsson & Panadero, 2018) or agree with the usefulness of feedback (Boud & Molloy, 2013b) provided by teachers. In fact, postsecondary students often report feedback practices in general as among the least satisfactory instructional interventions they experience (Boud & Molloy, 2013a; Carless, 2015).

In their review of the literature, Li and De Luca (2014) pointed out that students do not necessarily incorporate feedback when revising their written work. Utilization of feedback is influenced by students' active engagement with it (Handley, Price, & Millar, 2011; Jonsson, 2013; Jonsson & Panadero, 2018; Shute, 2008; Winstone, Nash, Parker, & Rowntree, 2017). The issue regarding unused feedback on the part of students has been highlighted by various scholars (e.g., Handley et al., 2011; Jonsson, 2013; Jonsson & Panadero, 2018; Nicol, Thomson, & Breslin, 2014), and many potential reasons have been identified. Students are sometimes dissatisfied with the feedback received (Boud & Molloy, 2013b; Nicol et al., 2014) and their preferred feedback changes depending on

the tasks they tackle (Jonsson, 2013). For instance, feedback about a task that is very specific to the given assignment is appreciated when students need to revise for resubmitting the final version. However, feedback about improving a process or skill for future assignments may not be appreciated for the task which requires resubmission (Jonsson, 2013). Winstone and her colleagues (2017) framed four factors that influence feedback receivers' actions on feedback: the receiver, the sender, the message, and the context. The present study focused on two factors among the four (receiver and message).

Notably for the formulation of the present research, feedback provision often adds a burden on teachers, who are typically the main feedback providers in formal instruction (Mulder, Baik, Naylor, & Pearce, 2014). Providing feedback to many students can create substantial workload for teachers (Bouzidi & Jaillet, 2009; Nicol et al., 2014). Furthermore, maintaining detailed and frequent feedback for a large number of students is regarded as almost impossible (Ballantyne, Hughes, & Mylonas, 2002). Thus, large classes such as one often sees in undergraduate education hinder the implementation of individualized and timely formative assessments since such assessment requires many tutors or teaching assistants (Falchikov, 2004; Kulkarni, Bernstein, & Klemmer, 2015). These challenges are magnified when feedback comments are included in the assessment process. Peer assessment has drawn considerable attention for its potential as an alternative to reliance on teachers for individualized and time-intensive feedback (Nicol et al., 2014).

1.3. An Overview of Peer Assessment

In recent years, peer assessment has seen increased use in postsecondary course designs. In peer assessment, learners, rather than teachers or experts, play the role of feedback provider. The effectiveness of peer assessment has been investigated and recognized by many researchers. However, inconsistent results have also been reported, in part due to the varied definitions of the terms used in peer assessment research. Thus, it is worthwhile to clarify how terms such as peer rating, peer marking, peer reviewing, and peer feedback will be applied in the current study. Peer feedback is a type of peer assessment, typically of drafts of written work, which provides written commentary. Peer rating, on the other hand, is a different type of peer assessment which provides only a quantitative evaluation, such as a score on a scale from 1 to 10.

Research on peer rating has found a strong correlation between experts' ratings and students' ratings of submitted assignments (Falchikov & Goldfinch, 2000). Recent evidence suggests that peer rating combined with peer feedback facilitates students' learning more than peer rating alone (Huisman, Saab, Van den Broek, & Van Driel, 2019; Li, Xiong, Zang, Kornhaber, Lyu, Chung, & Suen, 2016). Compared with the limited information available from numeric ratings, which in some contexts can be ambiguous, peer feedback has the potential to identify specific strengths and weaknesses in students' writing (Xiao & Lucking, 2008).

Peer feedback has the potential to save teachers' time and workload and provide students with an opportunity to receive individualized and prompt feedback. Notably, the peer feedback process can potentially enhance learning for both feedback recipients and providers. The question of the purpose of peer feedback is complicated by the presence of three agents in the peer feedback process—the instructor, the writer, and the reviewer. From the perspective of the instructor, the purpose of peer feedback may be to foster knowledge of the subject, including genre-specific writing ability, in both the writer and reviewer. One would expect this purpose to guide the assignment design and deployment, including assignment instructions, rubrics, communication protocols, technology implementation, and so on. From the perspective of the writer and reviewer, the purpose of peer feedback is more likely to be seen as improving the quality of the writer's product. While not necessarily in contradiction, it is possible for misalignment to occur between these two goals.

1.4. Two Roles: Writers and Reviewers

Students are usually required to take two roles in peer assessment: writers (assessees) and reviewers (assessors) (Cho & MacArthur, 2011; Hovardas, Tsivitanidou, & Zacharia, 2014; Topping, 1998). In each role students go through different processes and receive different benefits (Nicol et al., 2014). Reviewers have the opportunity to enhance their writing ability through "reading-as-the-reader." During the process of reading others' work, reviewers objectively compare their own and others' work from a reader's viewpoint and develop cognitive representations of what constitutes good or bad writing (Cho & Cho, 2011; Hovardas et al., 2014; Patchan & Schunn, 2015). In addition, the reviewing process requires reviewers to undergo various cognitively demanding operations: understanding evaluation criteria; judging the quality of writers'

work; and constructing feedback (Hovardas et al., 2014; Sluijsmans, 2002). These are only a few examples of reviewing operations, and others have been discussed by scholars (e.g., Cho & MacArthur, 2011; Topping, 1998). The importance of these operations is that they help reviewers to develop their ability to analyze and evaluate writing. In this way, the quality of feedback peer reviewers construct determines the benefits they obtain (Althauser & Darnall, 2001; Li, Liu, & Steckelberg , 2010).

Writers' benefits from peer feedback have been noted by several scholars. For example, benefits can be obtained from peers' use of simpler language than instructors might use in feedback comments (Cho & MacArthur, 2010; Falchikov, 2005; Hovardas et al., 2014; Nicol et al., 2014; Topping, 1998), timeliness (Gielen, Tops, Dochy, Onghena, & Smeets, 2010), and feedback from multiple sources in a single revision cycle (Topping, 1998, 2009).

The mechanisms involved in learning from the peer feedback process differ between the writer and reviewer roles. Some scholars have studied the differing benefits writers and reviewers receive from peer feedback activity, and mixed results have been reported. Some studies did not find differences in benefits (e.g., Cao, Yu, & Huang, 2019; Huisman, Saab, et al., 2018; Nicol et al., 2014), and several others found that reviewers reaped more benefits from peer feedback activity than writers (e.g., Althauser & Darnall, 2001; Lundstrom & Baker, 2009; McConlogue, 2015; Tsui & Ng, 2000). Hence, it is important to investigate peer feedback experiences from the perspective of writers so they can more fully realize the potential of this formative assessment process.

1.4.1. Use of Peer Feedback

While various factors determine the benefits that writers can obtain from peer feedback activities, one of the critical factors is the extent to which they use feedback from reviewers. Despite the effectiveness of peer feedback, students do not necessarily perceive peer feedback comments as helpful (Mulder et al., 2014; Nicol et al., 2014).

One of the key challenges reviewers face is constructing high quality feedback. Feedback quality potentially affects both the reviewer's own performance (Althauser & Darnall, 2001) and the writer's revisions (Mulder et al., 2014). However, the quality of feedback messages or comments from peer reviewers is naturally expected to be lower

than that of feedback from experts, since peer reviewers do not have the same level of knowledge or the amount of training or experience as experts (Cho & Schunn, 2007). Research (Min, 2003; Patchan & Schunn, 2016) has revealed that writers do not always utilize peer feedback in their revision actions. A writer may not use some feedback from a peer reviewer due to its perceived quality. Therefore, it seems reasonable to consider that the benefits writers obtain from peer feedback depends on the quality of the reviewers' feedback.

The quality and effectiveness of peer feedback have been studied extensively over decades, and various types of feedback comments constructed by reviewers have been identified. However, a standardized feedback typology has not been established. For my research, I reviewed and adopted, among other distinctions, two of the most commonly studied peer feedback categories—affective and cognitive feedback.

Affective feedback, usually conceptualized on a positive to negative dimension, is thought to play a part in writers' motivation (Hattie & Timperley, 2007). However, the influence of affective feedback on writers' revision actions has remained unclear. In the cognitive feedback category, various subtypes have been defined such as problem identification, suggestion, explanation, and direct correction. There is clear evidence for the efficacy of problem identification feedback (Nelson & Schunn, 2009), but the research findings regarding other subtypes are mixed. The effectiveness of suggestion (Cho & MacArthur, 2011), explanation (Gielen, Peeters, Dochy, Onghena, & Struyven, 2010), and direct correction (Kang & Han, 2015) have been demonstrated in some studies, although other research found no significant benefits of these same three cognitive feedback subtypes (Lu & Law, 2012; Truscott, 1996; Van der Pol, Admiraal, & Simons, 2008).

Components that affect the quality and effectiveness of peer feedback are still under debate due to the complexity of the process (Shute, 2008). Moreover, most studies focused on writers' learning performance, while few studies paid attention to their use of feedback (Lipnevich, Berg, & Smith, 2016). Tracking writers' use of feedback as an intervening variable is crucial to understanding how peer feedback can be designed to attain its full potential as an instructional strategy. Thus, further research is required to understand the quality of peer feedback from the writer's perspective and investigate what sorts of feedback are most appreciated and used by writers.

As Winstone and her colleagues (2017) have pointed out, the characteristics of feedback receivers (students) strongly affect students' use of teacher feedback. They observed that students' ability, prior experience, and attitudes may all affect their revision actions. Students' learning ability is constituted by various factors such as self-assurance, self-efficacy, academic achievement, and self-regulation, all of which vary widely (Winstone et al., 2017). In their feedback/response model, Lipnevich et al. (2016) included three personal factors that mediate students' use of feedback: learning ability, prior experience, and receptivity to feedback (a student's emotional reaction upon receiving feedback). Among these factors, students' learning ability exerts considerable impact on their revision actions.

The impact of differences in students' levels of ability on the use of feedback also has been reported in peer feedback settings (e.g., Lu & Law, 2012; Patchan & Schunn, 2016). One study indicated that writers with low academic ability did not receive as many benefits as those with high academic ability due to poor revision skills (Lu & Law, 2012). Another study revealed that writers who pay attention to rules or criteria outperformed those who pay less attention to them (Lin, Liu, & Yuan, 2001). On the other hand, some studies found no impact on writers' revision actions based on their learning ability (Patchan, Schunn, & Correnti, 2016; Patchan & Schunn, 2016; Walker, 2015). Therefore, the impact of writers' ability on their revision actions in peer feedback settings has remained inconclusive.

In terms of the prior experience factor, positive experiences with feedback lead students to acquire a positive attitude toward future feedback. This attitude prepares them for another successful experience (Lipnevich et al., 2016). In contrast, negative experiences create the expectation that feedback will not be helpful, which may negatively affect their engagement with it (Handley et al., 2011a). This logic could also apply to the peer feedback situation. However, empirical studies reported inconsistent results as to how writers' prior experience affected their attitude toward feedback (e.g., Kasch, Van Rosmalen, Löhr, Klemke, Antonaci, & Kalz, 2021; Wen & Tsai, 2006). To more comprehensively grasp the influence of writers' characteristics, prior experience with peer feedback was included as a factor in the present research.

Beyond their prior experience with peer feedback, students' attitudes toward peer feedback as a mode of formative assessment also constitute an important factor that

may affect their engagement with feedback (Strijbos, Narciss, & Dünnebier, 2010) and revision actions (Kaufman & Schunn, 2011). Students' perceptions of peer feedback have been studied by many scholars. The study of students' perceptions was identified as one of eleven core themes in Evans' (2013) review analysis of 460 articles regarding assessment feedback in higher education. Gathering and analyzing students' perceptions could help scholars who aim to create effective feedback design, understand students' beliefs or thoughts about feedback and their learning, and improve or adjust practices based on these perceptions. However, studies that analyze students' perceptions and their impact on writers' revision actions remain limited (Kaufman & Schunn, 2011).

1.5. Two Intervention Tools

To assist students, particularly writers, with enhancing their engagement and communication in the peer feedback process, two intervention tools were incorporated into the peer feedback design for this research: a *Prior Question Tool*, and a *Helpful Feedback Survey and Sharing (HFSS) Tool*. The *Prior Question Tool* was adapted from Gielen, Tops, Dochy, Onghena and Smeets (2010), and is a tool that provides writers an opportunity to communicate with peer reviewers and convey their needs, concerns, or requests to them. The *HFSS Tool* has two features. The first is the *Helpful Feedback Survey*, a survey which asks writers whether the quality of the peer feedback they received was satisfactory and allows them to nominate up to two exemplars of most helpful feedback. The second feature of the *HFSS Tool* makes available to all students in the class a list of helpful feedback nominated by writers. This tool was aimed at (a) supporting reviewers in their construction of feedback seen as helpful by writers, and (b) gathering data on what types of feedback writers considered most helpful.

1.6. Research Questions and Design

For the current study, 31 out of 33 undergraduate students enrolled in a course on instructional psychology volunteered to participate. The students were in their second or greater year of postsecondary studies. The course incorporated face-to-face teaching supported by a web-based Learning Management System (LMS). The peer feedback process was primarily implemented via the LMS.

The main purpose of this research was to investigate ways of increasing the value students obtain from essay assignments as a mode of formative assessment with the assistance of a peer feedback approach in a specific discipline. To fulfil this purpose and to address the previously described issues, four main research questions were posed:

1. What types of feedback comments were seen as helpful by writers, and what types did they use?

Helpful feedback from the writers' perspective was explored in three facets: (a) what sorts of feedback they requested from reviewers, (b) how they utilized peer feedback in the revision process, and (c) what types of received feedback they said they preferred. I developed a coding scheme using the constant comparison technique to analyze feedback comments. I also conducted case study analysis of three selected writers to illuminate the peer feedback process from individual writers' viewpoints.

2. What types of feedback comments do reviewers make, and how do these comments change as the peer feedback process iterates?

The changes of feedback over time that were examined in the study include changes in the frequency of each type of comment and changes in the specific types that were nominated as useful by writers. Comment analysis was performed to answer this question.

3. What were students' attitudes toward the peer feedback experience involving interventional strategies?

Forty-two questionnaire items were categorized into five subcategories: general peer feedback process, online implementation, intervention tools, received feedback, and others. Quantitative description was carried out to address this question.

4. How closely did students adhere to the instructions they were given for the peer feedback process?

In evaluating the effect of an intervention, it is important to monitor and report to what extent it was implemented as intended (i.e., treatment fidelity). I examined how the *Prior Question Tool* was utilized by and affected writers and reviewers. Interaction between writers and reviewers and students' use of the *Prior*

Question Tool were observed. Quantitative description was also used to address this question.

1.7. Research Findings and Implications

The comment analysis revealed that writers mostly asked reviewers to address topic-related concerns. The data collected in the *Helpful Feedback Survey* indicated that writers preferred feedback that featured directions and topic-related information. The case study analyses revealed that most directive and topic-related feedback was adopted by writers, though considering the multiple factors that may impact utilization of feedback, I am cautious about generalizing from the small number of cases examined.

Reviewers' feedback data in the comment analysis indicated that the largest proportion of constructed feedback was of the directive and topic-related types. The frequency of explanatory feedback was very low. Only one type was consistently observed to increase across the sequence of review activities (Assignment 1, 2, and 3). This was the feedback that both identified and explained problems in writers' work. Still, the proportion of this type of feedback remained small compared to other types. Feedback in which reviewers pointed out problems in writers' work without explanations or directions, and explanations without problem identification and directions decreased over time. In addition, feedback about organization of essays and writing format decreased in every assignment.

Quantitative description showed that students' attitudes toward the peer feedback experience were broadly positive, but a few negative perceptions were identified by individual questionnaire items:

- Half of the students reported that the peer feedback activity was time-consuming.
- Approximately 80% of students did not trust their peer's ability as a reviewer.
- Almost half admitted that the quality of the feedback they provided was affected by the quality of feedback which they received. Also, a majority reported that their construction of helpful feedback would be diminished if the quality of feedback which they received was not as helpful as they expected.
- Half complained that the feedback they received was not clear and applicable for revisions.

Reviewers responded to most of the requests made by writers. However, the response rate decreased in every subsequent assignment. Less than half the writers made full use of the *Prior Question Tool*. Approximately 60% of reviewers fully utilized the tool. Taken together, these findings suggest that the tool may be helpful but needs improvement to guide writers and reviewers in using it and constructing helpful feedback. One potential improvement for the tool would be integrating guiding prompts that reflect the evaluation criteria (Gielen & De Wever, 2015; Gielen, Peeters, et al., 2010) for writers and reviewers, and the helpful feedback types for reviewers (Gielen, Tops, et al., 2010; Voet et al., 2018).

In addition to interpreting the results, the final chapter of this thesis proposes a few design recommendations informed by my findings. First, menus or headings should be added to the *Prior Question Tool* to prompt application of certain feedback types and evaluative criteria. Second, a well-organized and user-friendly list of writer-nominated feedback comments should be accessible to reviewers. Third, more complete training which includes the purpose of and ways to use the *Prior Question Tool* and the *Helpful Feedback List* should be provided. Finally, to enhance writers' understanding of the feedback they receive and reviewers' understanding of request comments provided by writers, an open dialogue between writers and reviewers is suggested.

The current study was designed to inform improvements to writers' experience in the peer feedback process. This study identified what writers wanted from reviewers, how they acted during the revision process, and how they perceived the peer feedback experience with interventional strategies. This study also described the complex behavior of writers throughout the peer feedback process. Despite potential limitations in the generalizability of this research, the insights it contributes may assist system designers and instructors in enhancing writers' experience of peer feedback. Ideas for future research are proposed.

1.8. The Remaining Chapters in this Thesis

This chapter is followed by two narrative review chapters. In Chapter 2, I review the processes by which students learn through essay assignments. In Chapter 3, I review the theory and research concerning peer feedback and issues associated with peer feedback as an instructional strategy. The sources for these literature review

chapters were identified by comprehensively searching bibliographic databases and reading cognate literature reviews. The selected research focused on students in the later years of high school or postsecondary education. The reviews also prioritized research on students enrolled in first language (non-ESL) programs. In Chapter 4, I describe the research setting in detail. In Chapters 5, 6, and 7, I present the methodology, results, and implications of the research.

Chapter 2.

Learning from Assignment Essays

As discussed in Chapter 1, I emphasize the writing to learn approach because the data I analyzed were collected from undergraduate students assigned to write analytical essays to promote their learning of educational psychology concepts. The essay assignments were designed to enhance and provide a context for assessing students' understanding of the concepts presented in the course. In this Chapter, I review the processes by which students can learn discipline-specific knowledge through essay assignments. I also touch on fundamental writing processes as they are always present and integral to writing to learn.

2.1. Learning Course Content through Writing

A vast amount of research has been done about writing in general. Moreover, the relationship between writing and learning is complicated (Carter, Ferzli, & Wiebe, 2007). Thus, the focus of the literature varies depending on the authors' pedagogical aims and the learners. Some researchers and practitioners emphasize the power of language in enhancing learning (e.g., Emig, 1977). They focus on the effects of writing in general on students' learning. These scholars developed composition theories and attempted to apply them to any discipline (Bazerman et al., 2005). Other researchers investigated the relationship between writing tasks, instructions, and writing development (e.g., Graham & Harris, 2000; Slomp, 2012). Moreover, some researchers focused further on writers' cognitive processes during a writing task and systematized those processes (e.g., Hayes & Flower, 1980). However, the focus of the current study is students' learning—particularly acquiring concept knowledge introduced in a specific discipline—by using writing as a vehicle.

According to Graham and Perin (2007), writing performs two roles: as a skill and a device. As a skill, writing requires the application of various strategies (e.g., using planning, judgement, and revision to accomplish various goals). These goals can be the improvement of general writing skills and/or the accomplishment of an extrinsic goal (e.g., producing a written product, earning a good mark) through implementing writing

processes. As a device, writing is often used as a means for learning the content of a subject. These roles often bear a complementary relationship (Graham & Perin, 2007). However, the primary purpose of essay assignments may be to promote writers' understanding of topics introduced in a course. Accordingly, the influence of writing on learning needs is of significant theoretical and practical interest.

Writing to learn is a pedagogical approach (Fry & Villagomez, 2012) that has been adopted in many school settings in both K-12 and higher education (Bazerman et al., 2005). It can be denoted by terms that vary in connotation, such as 'writing across the curriculum', 'content area writing', and 'writing-intensive teaching' (Bangert-Drowns et al., 2004). This approach is based on the notion that writing is "a means of acquiring information, understanding concepts, and appreciating significance in any discipline" (Broadhead, 1999, p. 19). Therefore, through writing about the concepts introduced in a class, students can "identify areas of confusion or lack of knowledge, reason through problems, and bring concepts together in new ways" (Dunn, Saville, Baker, & Marek, 2013, p. 8).

The writing to learn approach is adopted in a task design in various ways, including informal journal writing to reflect on course materials or lab experiments, informal short-essay writing about issues and topics assigned by the teacher, and formal essay-length assignments aimed at persuasive justification of a claim (Klein, 1999). In the meta-analysis by Bangert-Drowns et al. (2004), the mean effect size of 48 writing-to-learn intervention studies was small (d = 0.26), and the mean effect size of 21 college-level studies was only slightly larger (d = 0.33). Bangert-Drowns et al. (2004) identified grade level, length of writing task, provision of metacognitive reflection, and length of writing-to-learn treatment as factors affecting students' learning achievement. While Bangert-Drowns et al. (2004) analyzed more general effects on learning, Graham and Hebert (2011) conducted a meta-analysis about "writing to read" (p. 710), which is a pedagogical strategy to improve students' comprehension of material they read. The results showed that the mean effect size of fifty-five studies which examined students in grades one to twelve and analyzed the relationship between writers' reading comprehension and their writing activities was d = 0.50.

The evidence suggests that even *short* writing assignments can improve students' understanding and retention of assigned readings. Nevid, Pastva, and

McClelland (2012) found that students in an introductory psychology course received a better mark on multiple-choice exam questions related to the concepts used in the 16 short writing assignments about concepts from a psychology textbook than those questions relating to concepts not included in the writing assignments. According to the researchers, the writing assignments allowed students to rehearse the introduced concepts and process them at a deeper level.

While the short writing assignments in Nevid and his colleagues' study were ungraded, similar results were found in a study by Stewart, Myers, and Culley (2010), which implemented short, graded, in-class writing assignments in psychology courses. The study compared the performance of students who received short writing assignments to those who did not. The students who received the short writing assignments outperformed the control group on topic-related multiple-choice questions and short essays about the same topic. Moreover, they had more positive perceptions about the assignments and the course design than the control group.

In addition to assigning written essays for their learning effects, instructors often evaluate the essays to assess students' understanding of course content in psychology courses (Dunn et al., 2013). This was the case in the setting for my thesis research.

2.1.1. Cognitive Processes that Facilitate Writing to Learn Content

While "writing and learning are distinguishable activities" (p. 32), writing can invoke and assist writers' application of cognitive learning strategies (Bangert-Drowns et al., 2004). According to Bangert-Drowns et al. (2004), effective learners "possess a rich arsenal of learning strategies, awareness of their strategies, knowledge of the contexts in which the strategies will be effective, and a willingness to apply their strategies" (p. 32). Those cognitive learning strategies include "rehearsal strategies, elaboration strategies, organization strategies, and comprehension-monitoring strategies" (p. 32). Bangert-Drowns et al. (2004) described how writing assists those strategies as follows:

> The repetition of content while writing performs rehearsal functions by increasing time-on-task and content exposure. Writing can support more sophisticated elaboration and organizational strategies by linking new understandings with familiar ones, synthesizing knowledge, exploring relations and implications, and building outlines and conceptual frameworks. And writing can be a tool of self-reflective monitoring of

> comprehension, thus creating opportunities for students to evaluate their understandings, confusions, and feelings about a topic. (p. 32)

McCutchen et al. (2008) noted that writing activities and genres designed to promote learning range widely (e.g., personal writing, analytic essays); therefore, the cognitive mechanisms involved are also likely to vary. Many cognitive learning processes are candidates for facilitating writing to learn content, but the role and significance of these is not fully understood. This section presents two types of processes that are relevant: (1) the cognitive learning processes that occur more or less exclusively while writing and are emphasized by writing theorists, and (2) the cognitive learning processes that often occur independently of writing and are emphasized by cognitive theorists.

2.1.1.1. Writing-specific Cognitive Learning Processes

Scholars who advocate the writing to learn approach often value rich and deep learning such as "'knowledge transformation' or 'conceptual change' (Bereiter & Scardamalia, 1987; Fellows, 1994; Schumacher and Nash, 1991), 'discovery' (Flower & Hayes, 1980a; McLeod, 1992), or the 'construction of meanings' (Spivey, 1990)" (Klein, 1999, p. 204). Klein (1999, pp. 208-209) reviewed several of the cognitive processes that may promote these laudable goals. He conceptualized four cognitive process hypotheses: "shaping at the point of utterance," "forward search," "genre-related," and "backward search."

The hypothesis of shaping at the point of utterance, which McCutchen et al. (2008) described as "the role of linguistic expression" (p. 567), is based on Britton's idea that "[w]hen we start to speak, we push the boat out and trust that it will come to shore somewhere—not anywhere, which would be tantamount to losing our way, but somewhere that constitutes a stage on a purposeful journey (p. 139)" (1980/1982, as cited in Klein, 1999). This notion does not require writers to plan or revise. It is instead a hypothesis that writers transform tacit knowledge into explicit knowledge in the moment they generate texts. It can be considered a writing-specific process in that, unlike a spoken utterance, a written utterance is a tangible, inspectable trace of the newly rendered idea. However, empirical evidence for this content learning hypothesis is scant (McCutchen et al., 2008).

In the forward search hypothesis, which relies on “support from a stable text” (McCutchen et al., 2008, p. 568), writers output their ideas as written language to save them. This process prevents working memory overload and enables writers to review the outputs repeatedly to make inferences and find discrepancies in their thinking. Writers connect and synthesize new ideas and prior knowledge by reading their previous outputs, conceptualizing key points, and re-expressing them in a more sophisticated form. This theoretical perspective values “the relative permanence of the written text” (McCutchen et al., 2008, p. 568). As noted by Klein, this permanence frees writers’ working memory for other operations such as reviewing relevant prior knowledge in long-term memory. Moreover, the written texts which writers produce support unlimited rereading and revisitation, and frequent revisitation of a draft by elementary student writers has been found to predict greater learning (Klein, 2000). It is the iterative evaluation of the draft which is thought to facilitate learning the content that the draft expresses or refers to. This may be similar to learning that occurs from critical rereading of assigned texts. Graham and Hebert (2011) asserted that writing to read (writing about given materials) enhances writers comprehension of the materials they read. The authors explained how writing about the materials helps writers to understand them. The act of writing requires writers to filter information from the materials, organize their ideas, and form associations among the ideas. It also facilitates writers’ efforts to “review, reexamine, connect, critique, and construct new understandings of text ideas” (p. 712). Writers can exercise decision-making regarding what and how to write about the ideas. Writing about the materials also requires writers to manage appropriately outputting the ideas in texts using their own words (Graham & Hebert, 2011).

In contrast, the backward search hypothesis emphasizes goal setting and revision. In this hypothesis, “writers construct knowledge by setting rhetorical goals, generating content to address these goals, then revising their rhetorical goals to accommodate this content” (Klein, 1999, p. 242). New ideas are developed through the repeated process of backward search and then incorporated into the writer’s rhetorical goals. Expert writers may undertake this process habitually, but novice writers may not have the skill to sustain content acquisition through this process. Those who adopt a goal setting perspective believe that iteratively addressing writers’ goals before or during writing facilitates writers in debating the limitations and constraints of their plan and their

language capacity. This debate also leads writers to generate ideas which were not initially included in their plan (McCutchen et al., 2008).

Finally, the genre-related hypothesis relates to various socially recognized forms of writing, including “argumentation, comparison/contrast, explanation, analogy, and personal writing” (Klein, 1999, p. 230). Among these different forms of writing, previous research has shown that analytical writing is more effective in helping learners understand the source materials than other types of writing such as note-taking. Klein (1999) reviewed previous studies on the learning effects of writing an analytical essay, some of which I will discuss in the next section. In the genre process, writers are required to understand a genre goal, and then they determine appropriate genre strategies. The selected strategy could lead writers to apply the genre knowledge that they possess. This operation could in turn invoke knowledge transformation for new learning (Klein, 1999). One can argue discipline-specific writing genres act as templates that encode discipline-specific knowledge. As examples, lab reports are typically structured in a way that reinforce knowledge of the scientific method, and the common tropes found in historical analysis essays rehearse fundamental concepts of historiography. There is substantial evidence that the genre of the analytical essay, which is deployed as a learning activity in a range of disciplines, is highly effective in promoting learning (McCutchen et al., 2008). McCutchen et al. (2008) stated that this genre fosters “sophisticated writing processes” (p. 569) which require organizing ideas and connecting them to prior knowledge.

These cognitive learning hypotheses are only some of those adopted in research on writing to learn, and they are not universally accepted. After reviewing 35 studies about writing and learning, Ackerman (1993) found that writing did not necessarily elicit learning. He argued that one of the problems with drawing general principles from the body of research he reviewed is the diverse designs and measurements deployed in the studies. Thus, the author stated that “[w]riting does complicate and thus enrich the thinking process but will result in learning only when learning is situationally supported and valued” (Ackerman, 1993, p. 359). Applebee (1984) similarly pointed out that the effects of writing on learning differ depending on the types of writing tasks, since each task requires managing different amounts of information. In addition, the depth of information processing which writers undertake differs depending on the type of writing task. For instance, tasks requiring summarization or repetition affect the recall of

information, whereas essay tasks that emphasize establishing new connections facilitate writers in understanding the connections between concepts (Applebee, 1984).

Arnold, Umanath, Thio, Reilly, McDaniel, and Marsh (2017) conducted a study to investigate how different writing tasks influence writers' learning and cognitive processes. The authors asked undergraduate students to read astronomy passages and randomly assigned them one of four tasks: highlighting, note-taking, free recall writing, and descriptive essay writing. Students in each condition completed the task without looking back at the passages they had read. The authors considered that both free recall writing and essay writing involve one of the key cognitive processes, retrieval, whereas highlighting and note-taking do not. Moreover, they presumed that two additional cognitive processes (reorganization and elaboration) are engaged during essay writing. The students' structure-building ability was measured through the reading part of the Multi-Media Comprehension Battery (MMCB), which contains four stories and multiple-choice questions about the critical ideas of the story. Writers' learning and cognitive processes were analyzed based on the posttest provided two days after the writing session, which included two types of multiple-choice questions (factual and inference) about the reading materials in the field of astronomy and short-answer writing about a scenario related to the materials in which they were directed to solve a problem. Both the essay writing and free recall writing groups performed significantly better than the highlighting and note-taking groups on the multiple-choice questions and the short-answer writing. No significant differences were found between essay writing and free recall writing. According to Arnold et al. (2017), writers in the free recall writing group, particularly those who had higher writing ability, constructed an essay-like response characterized by cohesive writing. Interestingly, their study found that writers' structure-building ability most positively affected their performance regardless of the writing tasks (essay writing or free recall writing). The data revealed that structure-building ability helped writers to retrieve content from their memory of the reading materials.

2.1.1.2. General Cognitive Learning Processes for Learning Content

To further develop the relationship between writing and content learning, it is reasonable to explore general cognitive learning processes that are likely to be deployed during a writing task like that assigned in my research. I expand this exploration to encompass cognitive learning processes that occur in multimedia settings, since the

assignments in the current study used video clips of classroom teaching and text as source material for analytical essays assigned to promote learning the application of educational psychology principles.

According to Fiorella and Mayer (2021), “learning is a generative activity” (p. 339), meaning that learning can occur when writers comprehend learning materials and judge the essential information by connecting and synthesizing the information with their prior knowledge through generative processes. Generative processes include the organization of the information and integration between the new information and writers’ prior knowledge. During these processes, students manage working memory, and then access and retrieve relevant knowledge from long-term memory through strong or weak cueing. The organization process occurs in working memory, and the integration process operates on long-term memory. Through the generative processes, writers draw inferences. The inferences facilitate writers in connecting concepts learned in a course and their prior knowledge. Moreover, metacognition and motivation are necessary to promote and regulate these generative processes. Writers are required to monitor their depth of understanding and regulate their problem-solving approaches. Motivation is a crucial factor in invoking writers’ pursuit of the generative and metacognitive processes for sensemaking (Fiorella & Mayer, 2021).

Fiorella and Mayer (2021) proposed three activities which could foster generative learning: verbalizing, visualizing, and enacting. The first activity, in particular, could relate to learning through analytical essay writing in multimedia learning settings. In verbalizing activities, writers engage with summarizing, self-explaining, and teaching strategies. The analytical essay assignments employed in the course design for the current study required writers to include a summary of the selected learning activities observed in assigned videos of classroom teaching, analyze them, and propose how they would teach differently than the teachers in the videos. In the analysis and proposal sections, writers were expected to explain their ideas and thoughts.

Among the three verbalizing strategies, Fiorella and Mayer (2021) emphasized the effectiveness of self-explanation. Self-explanation is “generating explanations to oneself” (Chi, De Leeuw, Chiu, & Lavancher, 1994, p. 439) to help learners comprehend novel information (Rittle-Johnson, Loehr, & Durkin, 2017). While summarization helps writers recognize the key ideas from learning material and integrate them with their

existing knowledge, it does not necessarily facilitate generative activity. On the other hand, self-explanation encourages writers to draw accurate inferences, which is a crucial strategy for connecting newly learned knowledge and their prior knowledge (Fiorella & Mayer, 2021). Through inferencing, the connection between prior knowledge and new information can be refined and expanded (Chi, 2021). Chi (2021) also asserted that self-explanation supports the generative learning approach to enhance writers' learning.

According to Chi (2021), text comprehension and self-explanation are different. Text comprehension occurs while writers are reading material. During the text comprehension processes, writers make inferences based on logic or schema and through connecting information. On the other hand, self-explanations involve learning new information. They need inferential processes which include:

> generating expectations, noticing similarities and analogies, noticing differences, reminding [themselves] of what else may be true, deducing the properties of a concept or meanings of words, inducing the concept's category, and connecting knowledge and new information to arrive at new conclusions, and so forth. (Chi, 2021, p. 383)

While the text comprehension processes aim to make an inference to fill in omitted information, the purpose of self-explanation is the amendment and renewal of writers' "naïve knowledge" (Chi, 2021, p. 383). Chi (2021) noted that naïve knowledge is present in prior knowledge although it may be illogically structured and organized.

One of the advantages of self-explaining is that it can benefit writers of all knowledge levels (from low to high prior knowledge). Chi (2021) stated, however, that low prior knowledge writers tend to obtain more benefits from self-explaining. Low prior knowledge writers have more opportunity to initiate knowledge change in their thought process to learn and generate new information and knowledge. Moreover, self-explanation can be prompted through visual learning materials rather than a text (Fiorella & Mayer, 2021). Self-explanation does not always occur spontaneously; thus, instructional supports may be needed to prompt or invoke self-explanation (Chi, 2021). While instructionally supported self-explanation may not be as effective as spontaneous self-explanation (Bisra, Liu, Nesbit, Salimi, & Winne, 2018), in their meta-analysis, Bisra et al. (2018) found that instructionally induced self-explanation was effective in a variety of subject areas (science: g = .57, math: g = .44, social sciences: g = .56, computer

science: *g* = .76) and for several different learning outcomes (inference: *g* = 1.79, recall: *g* = .50, problem solving: *g* = .45, transfer: *g* = .53).

As described above, the writing to learn approach, particularly via analytical essay writing, could theoretically yield abundant learning opportunities. In the following pages, I will review empirical studies regarding analytical essay writing.

2.2. The Essay Assignment

Due to the various benefits of the writing to learn approach described above, the essay assignment has been commonly used as an assessment format in a wide range of courses in higher education (Hounsell, 1997; Scouller, 1998), with psychology and educational psychology courses being no exception. According to the definition provided by Biggs and Tang (2011), the essay assignment is "a continuous piece of prose written in response to a question or problem" (p. 4) which is provided in advance so that students have time to prepare. The essay assignment is often given to evaluate students' knowledge and skills acquired through a course in a written format (McCune, 2004; Reid & Kroll, 1995). More specifically, it is often used to assess students' higher-level cognitive abilities (Biggs & Tang, 2011). As stated by McCune (2004), the essay assignment "requires students to engage actively with material, to examine ideas in depth, to integrate and critically evaluate what they read, and to state their understanding clearly—which often means that they develop their understanding further" (p. 257). She also asserted that the essay assignment helps students participate in their discipline's academic discourse. Previous studies have confirmed the effectiveness of essay assignments in promoting deep learning (e.g., Biggs & Tang, 2011; Scouller, 1998).

Writing an analytical essay directs students to develop a more sophisticated understanding of acquired information (Durst & Newell, 1989). Newell (1984) compared students learning from three different writing tasks: (1) writing short answers to questions from textbooks (a science textbook and a social science textbook); (2) taking notes to prepare for tests; (3) writing an analytic essay including concepts from the given passage. Eight eleventh-grade students who demonstrated high reading and writing ability were selected for the study. Analytical essay writing produced the highest scores on a measure of passage-specific knowledge. Newell pointed out that essay writing

prompted various operations—such as reviewing evidence, refining ideas, and repeatedly assembling and constructing information—that did not occur during the short answer writing and notetaking tasks.

Langer and Applebee (1987) reported on three studies designed to investigate secondary school students' learning from different writing tasks. In the first study, which was a small project, three different writing tasks—note-taking, short-answer writing, and analytical essay writing—were assigned to students after they read two passages from a social studies textbook. A pretest and a posttest measured passage-specific knowledge by requiring free writing about five main concepts from each passage. Students' knowledge was rated based on the breadth and depth of passage-specific information. Analytical essay writing yielded the greatest gain in passage-specific knowledge.

In the second study by Langer and Applebee (1987), four writing tasks were provided: study as usual, short-answer questions, note-taking, and analytical writing. This large-scale study included 208 students from six nineth-grade and six eleventh-grade classes. Four passages of reading materials for students were selected from a high school-level social studies textbook. Two classes from each grade level were assigned one of three passages at random. The writing tasks were randomly assigned to each student within classes. Three learning measurements were used: passage-specific knowledge, multiple-choice questions to assess overall passage comprehension, and an extended essay to measure the application of new concepts. The analytical writing group had the lowest scores on an immediate passage-specific knowledge test and a passage-specific knowledge test given four weeks later. However, the data indicated that the declining rate of the scores between the immediate and posttest was the lowest in analytical writing. Langer and Applebee (1987) explained that analytical writing led to a narrower content knowledge at the initial test, but the writers in this group retained the same level while other groups declined over the four-week retention period. Students in the analytical writing group scored highest on the concept application measure, which, as a measure of learning transfer, would usually be regarded as most closely corresponding to course learning goals.

In the third study, Langer and Applebee (1987) compared the effects of four learning tasks related to provided text passages: study as usual, short-answer questions, summary writing, and analytical writing. A total 112 students from two nineth-

grade and two eleventh-grade classes participated. Two passages from the previous study were used. Students were randomly assigned to passages and writing tasks within classes. Think-aloud protocols provided by eight additional students revealed that analytical essay writers tend to seek specific points in the passage and focused on integrating the points with their own ideas about the topic. In terms of the recall measurement, the analytical writing group recalled the most content units from the passage in both one-day-later and six-day-later retention tests. Overall, Langer and Applebee (1987) found that analytical essay writing was superior to other learning activities in the retention and transfer of information presented in a text passage. Students who completed analytical writing tasks were better able to select and organize key ideas from the source material.

In research on sixty undergraduate students learning about historical events from writing, Wiley and Voss (1996) compared three writing tasks (history, narrative, and argument writing) and investigated their effects on learning from either (a) a single text, or (b) multiple sources containing the same information. Students' learning was measured by a recall test and by analyzing the structure and content of their writing. The multiple sources group contained significantly more "transformed" (p. 68) sentences than the textbook group. Transformed sentences were sentences that integrated information from the assigned material with new ideas brought by the student. The students who wrote argumentative essays constructed significantly more causal connections and explanations than those assigned to other writing tasks. Moreover, the group created significantly more connections between their own ideas and the content from the materials. The researchers found that the combination of argument writing and multiple sources yielded significantly greater content recall.

In subsequent research, Wiley and Voss (1999) extended their investigation of the effects of using a single source versus multiple sources and different writing assignments. They found that argument writing and multiple sources produced better performance on a test in which the students were asked to make inferences from the source information. Those conditions also led to fewer copied or paraphrased sentences and more transformed sentences in the students' written product. The overall picture from these results is that argument writing with multiple sources fosters deeper and more resilient learning of causal relationships among historical events described in the sources.

As described above, essay assignments, particularly analytical essays, are favoured because they facilitate writers' cognitive learning processes and assist them in understanding and learning materials provided in a course. In addition to the benefits of essay assignments as a powerful tool for constructing knowledge, Scouller (1998) asserted that essay assignments produce deeper learning that enables students to think more analytically and critically about the subject. According to Scouller (1998), students employ either a deep or surface approach when preparing for assessment tasks. A deep learning approach focuses on the meaning of and connections among theories and practices. However, not all students deploy a deep approach, even though it may be encouraged. They instead use a surface approach in which their goal is to pass the course by verbatim memorization of disconnected pieces of information without concern for synthesis and organization.

Scouller (1998) collected data from 206 education undergraduate students to compare how they approached two assessment methods—an essay assignment and a multiple-choice examination. She analyzed students' preferred learning approaches (deep or surface), perceptions about each method, and scores from a multiple-choice examination and an essay assignment. The results indicated that students tend to apply a deep learning approach for the essay assignment task and a surface approach for the multiple-choice examination. Students tended to believe that the purpose of the essay assignment was to assess higher-level abilities, whereas that of the multiple-choice examination was to assess lower-level abilities. She found that there was no observable performance advantage in applying a deep learning approach to studying for the multiple-choice exam, but those who applied a deep learning approach to the essay assignment outperformed those who applied a surface learning approach.

Taken together, these studies establish that analytical and argumentative writing tasks foster more meaningful and resilient learning of source content than summary or expository writing tasks. Moreover, writers' understanding of and learning from provided materials can be enhanced when multiple sources are provided rather than a single source. Multiple sources not only refer to a single medium but also to combinations of media (e.g., text and video, audio and illustration). According to Chi (2021), multimedia sources can provide additional and more holistic information. For instance, writers obtain certain information through spoken audio and somewhat different information when the same events are depicted in pictures. Receiving related information in two modalities

enables dual coding for the events in long term memory which supports more robust recall and application of the acquired knowledge (Mayer & Fiorella, 2022; Paivio, 1986). Perhaps most importantly, students are required to integrate information across sources when they deal with multiple sources. The integration process yields self-explanation and thereby promotes deep understanding.

2.3. The Core Processes of Writing and Revision

As we have seen, research on essay assignments has indicated that this type of writing promotes student learning of concepts introduced in a course. However, meta-analyses have shown only small (d = 0.26) to medium (d = 0.50) effects of essay writing on learning (Bangert-Drowns et al., 2004; Graham & Hebert, 2011). The relatively small effect size implies that assigning essay writing does not automatically invoke learning benefits (Bangert-Drowns et al., 2004). Moreover, students may not appreciate that a writing assignment helped them learn the concepts introduced in the course if the score they receive is less than what they expected. Students undertaking a writing assignment may not be motivated to use it as an opportunity to develop their understanding of course concepts or their writing skills, but instead may be focused on producing a written product that meets the assignment requirements. Presumably though, instructors believe that engaging with the writing process will incidentally and inevitably enhance learning of course topics. In this section, I summarize models of the core writing processes and focus on revision as the writing process most relevant to peer review of writing.

The core processes engaged during a writing activity have been investigated by several scholars (e.g., Hayes & Flower, 1980; Perl, 1979; Pianko, 1979). For instance, Perl (1979) observed in her student participants three main writing processes—rewriting, writing, and editing. Pianko (1979) identified seven composing processes: prewriting, planning, composing, rereading, stopping, contemplating the finished product, and handing in the product. Each process (except for the last in Pianko's model) requires writers to activate and regulate complex cognitive functions. As another example, in their cognitive writing process model, Flower and Hayes (1977) recognized three significant processes: planning, text generation, and revising. Later research by Chenoweth and Hayes (2001) reorganized those categorizations into four distinct roles: proposer, translator, reviser, and transcriber. They explained each process as follows:

> The proposer is a prelinguistic source that produces ideas to be expressed. The translator converts the prelinguistic ideas into strings of language with appropriate word order and grammar. The reviser evaluates both proposed and written language, and the transcriber turns the content of the articulatory buffer into written language. (p. 84)

The components of the writing process do not follow a strictly linear sequence but rather should be seen as both linear and recursive (Sommers, 1980).

The enactment of each process varies across individual writers (Chenoweth & Hayes, 2001). Furthermore, the writing process can be affected by writers' motivation, writing goals, and "task schema" (p. 375) (Hayes, 2012). According to Hayes, less skilled writers are often less enthusiastic about improving their writing skills. Those writers who have low motivation tend to invest less time in the writing processes summarized here. Hayes (2000) also stated that students' writing ability is affected by their reading ability and discussed various reading skills demanded during the writing process. Reading source text is one of them. Good readers can accurately comprehend and interpret the information in source texts. In contrast, poor readers are apt to misread and excessively simplify the source texts, and this could compromise their written work since the interpretation of any source texts they cite in their work may be inaccurate or incomplete. Thus, a writer with poor reading ability is more likely to produce a lower quality initial draft (Patchan & Schunn, 2016). According to Patchan and Schunn (2016), higher ability writers engage with detection, diagnosis, and problem solving during a writing process more than lower ability writers. This difference may affect the quality of initial drafts. In addition, the quality of the writers' initial draft indirectly affects their revision actions because the types of feedback which the reviewers construct are influenced by the quality of the draft (Cho & Cho, 2011).

Being less skilled in writing can be a significant disadvantage in meeting educational goals (Hayes, 2000). Therefore, various interventions have been proposed to assist student writers with insufficient writing skills (Duijnhouwer et al., 2012). Planning and revising are the two most extensively studied types of strategy for improving the quality of student writing (Kieft, Rijlaarsdam, Galbraith, & Van den Bergh, 2007). Because this thesis research investigated peer review as an approach to enhancing the writers' experience, an approach intended to support revising strategies, the next section reviews revision processes and strategies. The potential benefits and challenges of peer feedback are considered in Chapter 3.

2.3.1. Revision

The revision process is a core part of every writing model mentioned in the previous section[1], although composition researchers may label it differently. While each process is crucial to completing an essay assignment, the importance of the revision process has been acknowledged by many scholars (e.g., Bridwell, 1980; Fitzgerald, 1987). The positive relationship between revision and the quality of written work has been recognized for many years (Fitzgerald, 1987). Moreover, the revision process is thought to assist writers' cognitive and linguistic development (Bridwell, 1980).

During the writing process, revision usually aims to align what the writer wrote with what they intended (Sommers, 1980). Hayes and his colleagues noted that "the cue or initiating condition for revision is a dissonance or incongruity between intention and execution" (p. 179). Fitzgerald (1987) defined revision as follows:

> Revision means making any changes at any point in the writing process. It involves identifying discrepancies between intended and instantiated text, deciding what could or should be changed in the text and how to make desired changes and operating, that is, making the desired changes. Changes may or may not affect meaning of the text, and they may be major or minor. (p. 484)

As stated above, the revision process embraces various cognitive subprocesses (Hayes et al., 1987). A number of researchers have attempted to schematize the revision process (e.g., Bridwell, 1980; Hayes et al., 1987; Sommers, 1980). Hayes and his colleagues (1987) proposed a revision model based on research that used the thinking-aloud protocol. In their model, four subprocesses were introduced: task definition, evaluation, strategy selection, and modifying text and/or plan. To evaluate writers' work, they first define a revision task that includes a revision goal, text features (e.g., global, local), and the extent of revision action. During the evaluation process, writers checked if their composed texts were understandable and identified problems, if any, while they reread their work. In the strategy selection process, writers decide whether to modify the revision process itself or the written texts. When writers proceed with the first strategy, they have three options: disregarding the problem, putting the revision action on hold temporarily, and seeking information to elucidate the problem.

[1] In Pianko's process, the revision was included in the rereading process.

When writers pursue revising the texts, they usually have the choice of either rewriting or revising. Revising strives to preserve the original text and rewriting does not, even though both options may attempt to keep the original text's intended meaning. Rewriting is a simpler strategy to fix the detected problem than revising, since this strategy does not require the writer to recall the reasoning behind the original construction as they resolve the problem. In addition, deleting, which may be the quicker solution, runs the risk of producing a worse product. These subprocesses are influenced by writers' knowledge, including goals, criteria, nature of the problem (ill-defined or well-defined), and problem-solving rules and operations.

The revision process is complex and is influenced by many variables. Faigley and Witte (1981) asserted that revision action is influenced by "situational variables," which refer to:

> the reason why the text is being written, the format, the medium, the genre, the writer's familiarity with the writing task, the writer's familiarity with the subject, the writer's familiarity with the audience, the projected level of formality, and the length of the task and the projected text. (pp. 410–411)

Previous studies examined how revision action differs depending on writers' ability. Many of the previous studies reported that more experienced writers make more sophisticated revisions (e.g., Bridwell, 1980; Hayes et al., 1987; Perl, 1979; Sommers, 1980). For instance, Sommers (1980) found that experienced writers were prompted to revise by a wide variety of cues which include both local and global aspects such as "lexical, syntactical, semantic, or rhetorical" cues (p. 144), whereas less experienced writers were prompted to revise primarily by lexical cues alone. Also, experienced writers revised from a holistic perspective, but most of the changes made by inexperienced writers operated merely at the level of words or phrases. Experienced writers are capable of broader revision strategies than student writers. Thus, student writers often choose not to revise when they do not know what to do or how to do it, do not think it is worth trying, or are not confident in their work.

Bridwell's (1980) study also revealed that twelfth-grade writers mainly made lexical level and surface level changes (e.g., spelling, word choices) during revision, rather than phrase or sentence level changes. Similarly, Hayes et al. (1987) found that student writers mainly focused on local level revisions, whereas expert writers operated at local and global levels, meaning, and the readers' viewpoint. Experts can approach

the revision process holistically because they possess more knowledge of and strategies for revision.

Perl (1979) investigated unskilled college writers' composition processes. She reported that unskilled writers spent a lot of time revising and cared about a variety of issues (e.g., spelling, word choice, grammar, organization). However, these issues were not necessarily fixed in the final version. Perl pointed out a few possible reasons for this. First, unskilled writers did not have appropriate knowledge of writing rules; thus, the changes they made were not suitable or acceptable. Second, their perceptions of good writing were not congruent with those of readers. Third, unskilled writers' egocentric thinking made them believe that readers should be able to understand their writing even though it was not necessarily clear or not making much sense.

Since the 1970s, researchers have attempted to examine the relationship between the extent of writers' revision work and the quality of the completed work. Inconsistent results regarding the relationship have provoked ongoing debate in the literature. For instance, Beach (1976) found that college student writers who made extensive revisions tended to produce higher quality writing. Hayes et al. (1987) also stated that inexperienced writers do not make many revisions that change the meaning of their writing compared to experienced writers. Conversely, Dieterich (1976) claimed that the extent of revisions is a poor indicator of writing ability. He explained that writers' decision not to extensively revise was based on the quality of the first draft. Higher ability writers were more likely to engage in a well-planned writing process that resulted in a higher quality first draft.

Bridwell (1980) similarly argued that good writers did not have to make extensive revision because the quality of their draft was already relatively high. On the other hand, despite the lower quality of their initial drafts, poor writers were less likely to make revisions where they were needed, or their revision action, although sometimes extensive, was limited to the surface or word level. Possible explanations for why extensive revision by unskilled writers did not improve their final work were provided by Perl (1979). First, the revision action could interrupt a chain of their thinking process due to the recursive nature of the revision process. Second, they became too preoccupied with "error-hunting" (p. 31) to spend additional time on other issues such as organization and semantic sufficiency.

The studies mentioned above indicate that inexperienced writers, whether in high school or higher education are less efficient at revising their work than expert writers due to their immature revision skills or knowledge base. Also, classic research on revision has produced inconsistent results with regard to the relationship among writers' ability, the extent of the revision work, and the quality of their revised work. Since the revision process is complex and affected by various factors, it is crucial to assist less experienced writers as they are revising their work. Therefore, the current study focused on feedback, particularly peer feedback, as a strategy to assist less experienced writers develop and express their knowledge of the subject.

2.4. Summary

The essay writing assignment is suitable for promoting students' learning of discipline-specific concepts introduced in a course as it leads them to engage various cognitive learning processes. Several published studies (e.g., Klein, 1999; McCutchen et al., 2008) described writing-specific cognitive learning processes from various viewpoints (e.g., forward search, backward search). Moreover, to comprehend the complex relationship between writing and content learning, several general cognitive learning processes such as generative learning processes should be taken into consideration.

Research comparing essay writing with note-taking and narrative writing has found that working on essay assignments, especially analytical essays, more effectively enhances students' acquisition of course concepts. Essay assignments facilitate students connecting and integrating newly introduced information with prior knowledge. Notably, content knowledge acquisition can be enhanced in multimedia settings since information from multiple sources more readily prompts self-explanation than information from a single source.

Of course, the benefits of writing to learn are not uniformly distributed. Undergraduate students who are less experienced writers tend to use a surface approach in essay assignments and may not acquire content knowledge effectively from essay assignments. Several scholars have asserted the relationship between writing and student learning, and have decomposed writing into several processes (e.g., Hayes & Flower, 1980; Perl, 1979). Among the various writing processes proposed by scholars, revision is seen as one of the most amenable to interventions capable of yielding

improved writing outcomes and enhanced content learning. It can be inferred from the review in the earlier sections of this chapter that revising involves resolving discrepancies between writers' existing knowledge and knowledge obtained from external sources (teacher or peer feedback). It evokes self-explanation which leads students to resolve the discrepancies.

As revision is a key element of writing, developing and evaluating new instructional strategies that centre on revision holds significant potential for improving the learning benefits students obtain from writing assignments. Therefore, in the current study, I focused on developing tools that scaffold revision and on evaluating writers' experience in using them.

Chapter 3.

Peer Feedback

Peer assessment is a promising strategy to provide multiple iterations of feedback to student writers in a timely manner without compromising the quality of formative assessment (Ballantyne et al., 2002; Kulkarni et al., 2013; Topping, 1998). Peer feedback in particular is "a core component of peer assessment" (Strijbos, Narciss et al., 2010, p. 291). In this chapter, I discuss the effects of peer feedback on essay writing. I focus on research investigating instructional contexts where the language of instruction is L1 for most students. I also describe some challenges to the efficacy of the peer feedback process that emerged from previous studies. Challenges faced by writers rather than reviewers are particularly emphasized, since the focus of the current study is improving writers' peer feedback experience. I also present two intervention tools which I designed by adapting intervention strategies from previous studies. The *Prior Question Tool* and the *Helpful Feedback Survey and Sharing Tool* were designed to maximize the value of the peer feedback experience for writers.

Very little research has investigated the effects of peer feedback on acquisition of discipline-specific concepts through writing. Instead, the research has largely studied peer feedback in the context of assignments intended to develop analytical writing ability. Nevertheless, it is still relevant to review the body of research on peer feedback, because, as was discussed in the previous chapter, students acquire conceptual knowledge about a topic by engaging in analytical writing about the topic. I infer they do so even when the intended learning goal of the task is development of general writing ability or ability to write in a disciplinary genre. Moreover, any research that examines peer feedback on writing can potentially illuminate the benefits and challenges of peer feedback in settings like that investigated in my thesis. In this chapter, except where indicated otherwise, the purpose of the assignments in the peer feedback research I discuss is development of general analytical writing ability. Where a disciplinary focus is indicated (e.g., psychology, engineering), I don't attempt to distinguish between the learning goals of disciplinary writing or disciplinary concepts because that distinction tends to be either unstated in the primary research or irrelevant to the point under discussion.

3.1. Feedback

Among the many interventions known to enhance learning, feedback has been considered one of the most powerful by many scholars (e.g., Fraser, Walberg, Welch, & Hattie, 1987; Gibbs & Simpson, 2002; Hattie & Timperley, 2007; Sadler, 2010). After reviewing previous studies, Butler and Winne (1995) defined feedback as "information with which a learner can confirm, add to, overwrite, tune, or restructure information in memory, whether that information is domain knowledge, metacognitive knowledge, beliefs about self and tasks, or cognitive tactics and strategies" (p. 275). In formative approaches, feedback has an essential role in improving students' performance levels and achieving a learning goal (Taras, 2005). Formative approaches identify the gap between students' current knowledge and a set of predetermined criteria (Looney, 2011). When an essay assignment is used for formative purposes, students' revision actions can be substantially affected by the content of feedback (Black & Wiliam, 1998). There is plentiful evidence that feedback is among the factors with the most beneficial impact on student learning. According to Butler and Winne (1995), feedback can be provided from two sources: external and internal. During completion of an assigned task, learners generate internal feedback by continuously monitoring the alignment of their goals, strategies, and acquired knowledge and beliefs. Internal feedback helps writers adjust their goals, revise their strategies, restructure their knowledge and alter their learning path to successfully complete the task. External feedback, which is obtained from external sources such as teachers and peers, provides additional information to verify the writers' tactics and knowledge. The current study focused on the benefits and challenges of external feedback and ways to improve writers' feedback experience.

3.1.1. Writers' Use of Feedback

While it is reasonable to assume that students use internal feedback to determine what needs to be done to improve their writing (Nicol & Macfarlane-Dick, 2006), there is more evidence that external feedback enhances learning (Butler & Winne, 1995; Hattie & Timperley, 2007). However, the utility of external feedback can be affected by various factors. For instance, a gap between students' and tutors' conceptions of essay writing can hinder students' ability to use feedback from tutors (McCune, 2004). McCune (2004) found that first-year psychology students'

understanding of essay writing could be modeled using three conceptual components: evidence, structures, and conclusions. The study indicated that the explicitness and certainty of students' essay writing conceptions in each component varied. Some students could clearly and specifically describe what essay writing should be, but others were only able to describe it vaguely. The tutors' descriptions of good essay writing were similar to those of students who provided clear descriptions. Both groups expressed that essay writing should include "[u]sing evidence to support arguments" (p. 262), "[developing a] structure from content" (p. 264), and "[d]rawing conclusions from evidence" (p. 265). However, the researcher reported that only one student could fully describe these higher-level conceptions by the end of the academic year when the research was conducted. Moreover, those students whose conceptions were not fully developed tended to misunderstand feedback provided by the tutors.

Students' use of feedback should be considered in the quest to improve students' essay writing (Nelson & Schunn, 2009; Shute, 2008) through the design of formative assessment. In the context of my thesis, I define the use of feedback to include engaging with, acting on, implementing, and/or applying it. Feedback can be valuable for writers if they engage with it during the revision process (Laurillard, 1993; Lipnevich et al., 2016; Winstone et al., 2017). Students' active engagement with external feedback is needed before it can enhance their writing ability and improve the immediate written product (Nicol & Macfarlane-Dick, 2006). Much research on the use of feedback has been conducted. Unfortunately, researchers have reported that students often do not engage with the feedback they are given (Jonsson & Panadero, 2018). Students' dissatisfaction with the feedback they receive may be a significant factor in their lack of engagement (Boud & Molloy, 2013b).

3.1.1.1. Factors Preventing Writers' Use of Feedback

Why do writers not use the feedback they are given—even by experts—to improve their writing? Various possible answers to this question have been considered by researchers (e.g., Jonsson, 2013; Winstone et al., 2017). According to Jonsson (2013), several factors have been reported in previous studies, including students' perceptions of teachers' credibility, the mode of delivery, students' demographic attributes and their competencies. In addition to these influential factors, Jonsson also identified several factors affecting students' use of feedback through his systematic

review. He found that students may not use feedback if it is not useful, explicit, precise, individualized, if the tone of the feedback is authoritative, and if students do not know productive ways of using feedback.

Winstone et al. (2017) divided the factors determining students' engagement with feedback into four categories: receiver, sender, feedback message, and learning context. The receiver and sender categories include the receivers' (writers') and senders' (reviewers') individual characteristics. The receiver category includes their ability, outcomes in prior activities, and readiness to receive feedback. Winstone et al. explained that the level of writers' academic self-concept, academic abilities, self-efficacy, self-regulation skills, and academic achievement are all theoretically relevant factors in writers' engagement with feedback, as are other factors such as gender and prior experience. Moving to the sender factors, Winstone et al. presupposed the perceived level of expertise of the reviewer to be a powerful factor influencing the writer's use of feedback. The reviewer's credentials as an expert would contribute to this effect, as would the perceived power balance between the reviewer and writer. The writer's trust in the reviewer, and their trust in their own abilities as a writer, have also been identified as influential factors (Jonsson & Panadero, 2018). The feedback message category contains various influential factors such as the mode, timing, and content of the feedback (Jonsson & Panadero, 2018). According to Jonsson and Panadero, the mode is the feedback delivery method such as oral, written, or video. The timing factor identifies the feedback as immediate, delayed, or having other temporal properties. The content refers to qualities of feedback such as its accuracy, tone, specificity, etc. The learning context category contains factors such as course design, training, guidance to help students effectively use feedback, and the presence or absence of grades provided by experts. My research focused on factors from two of the four categories—the receiver category and the feedback message category.

3.1.1.2. Messages in Feedback

Many studies have investigated the effects of feedback in a wide range of instructional applications (e.g., Hattie & Timperley, 2007; Kluger & DeNisi, 1996; Shute, 2008). With respect to writing, one result that has clearly emerged is that if writers think the feedback is useless they will not apply it in their revision process (Boud & Molloy, 2013b; Jonsson, 2013; Winstone et al., 2017). Few studies have focused on the

association between students' use of feedback and their learning (Lipnevich et al., 2016; Winstone et al., 2017). Lipnevich et al. (2016) attempted to identify the message-related factors that determine students' use of feedback. These included the following:

- whether the feedback contains information about a gap between the writers' work and the learning goal;
- whether the feedback is accurate;
- the perceived tone of the feedback;
- whether the focus of the feedback is related to the task, the process of task completion, self-regulation strategies, and personal business as described by Hatti and Timperley (2007);
- whether the feedback is detailed;
- the degree to which students understand the received feedback;
- whether the feedback matches student expectations;
- and timing of the feedback.

Much research has attempted to identify the characteristics of effective feedback messages. After reviewing over 100 studies of students' use of feedback in higher education, Jonsson (2013) found that the quality of feedback matters more than quantity. Authoritative feedback, which includes a patronizing tone, mandates, and many evaluative comments from teachers may prevent students' use of feedback. Many researchers reported that students preferred clear, detailed, individualized, and directive feedback. However, Jonsson also found that the relationship between the use of feedback and students' preference was inconsistent. The effects of the elements mentioned above can differ depending on the settings and contexts, because the use of feedback is also affected by various factors described in the previous section. Thus, these types of feedback do not reliably contribute to improved student performance (Jonsson, 2013). In their literature review, Winstone et al. (2017) found influential factors similar to those identified by Jonsson. They also warned that students may not engage with feedback when teachers use academic jargon and technical words from academic policies and regulations.

3.1.1.3. Writers' Individual Differences

As mentioned above, writers' characteristics influence their use of all types of feedback. Various individual characteristics have been identified as potentially playing this role. The model of feedback as a learning process developed by Lipnevich et al. (2016) lists three influential learner characteristics: learning ability, prior experience, and receptivity to feedback.

Learning ability is a psychological construct manifested as academic performance. In their literature review, Winstone et al. (2017) revealed that ability-related factors such as academic self-confidence, self-efficacy, self-regulation, and domain knowledge affect how students respond to feedback. Students with higher self-efficacy or self-confidence invest more time engaging with feedback (Baadte & Schnotz, 2014; Handley et al., 2011). Nicol and Macfarlane-Dick (2006) argued that students who effectively self-regulate make better use of feedback. Orsmond and Merry (2013) found students with high academic performance invested more time engaging with feedback and were more likely to show transfer to later tasks than those with low academic performance. However, Bounds, Bush, Aghera, Fodriguez, and Stanfield (2013) reported that 72 high academic ability residents in an emergency medical training program neither engaged with oral feedback by experts nor used it for generating learning goals. The same research also found the residents tended to use feedback from the experts when it agreed with the self-assessment made by the residents. The authors explained that feedback should reflect learners' internal feedback to facilitate their use of feedback, regardless of their ability. Further research is needed to clarify under which conditions students' academic ability and active use of feedback are related (Winstone et al., 2017).

Prior experience with successful outcomes obtained via the assistance of feedback can also be a significant factor affecting students' use of feedback (Winstone et al., 2017). Students who are satisfied with the grades they receive for their performance in a learning activity including the provision of formative feedback tend to have a positive feedback experience and are more likely to accept feedback they receive in future learning activities. In contrast, negative experiences, such as obtaining no improvement in their grade after utilizing feedback, may cause students to withhold their acceptance and utilization of future feedback (Lipnevich et al., 2016). As stated by Winstone et al. (2017), such withholding behavior is the result of "a readiness to dis-

engage" (p. 551) as first conceptualized by Handley, Price, and Millar (2011). Handley and her colleagues (2011) conceptualized student engagement with feedback and asserted that students' readiness-to-engage is one of the core components influencing student engagement. They stated that readiness to engage or disengage with feedback is shaped by their past experience with feedback. Concurring with Lipnevich et al. and Handley et al., Winstone et al. remarked that a student's experience of disappointment resulting from a gap between their expected and received grade on an assignment in which they utilized formative feedback could negatively influence their future willingness to use feedback (Winstone et al., 2017).

Writers' receptivity to feedback may also depend on their emotional reaction to it, such as their enjoyment or displeasure (Lipnevich et al., 2016). It has also been shown that students' awareness of the purpose and benefit of feedback affects their receptivity to it (Jonsson & Panadero, 2018). For instance, Harris, Brown, and Harnett (2014) collected survey responses from 193 primary and secondary students in New Zealand and reported that they perceived feedback from teachers positively. Harris et al. (2014) pointed out that, even when they receive disappointing grades, students' positive regard for teacher feedback can lead them to accept and utilize feedback, because they believe it helps them learn.

3.1.2. Challenges with Teacher Feedback

Individualized and informative feedback that focuses on individual progress and mastery in the learning process nurtures students' sense of self-worth (Ames, 1992). Timely feedback also has been emphasized as a constructive practice to boost learning gains (Chickering & Gamson, 1987). Therefore, effective feedback should be provided to enhance student learning, with appropriate timing based on the type of tasks and students' characteristics and needs. Frequent and detailed feedback is central for learning; however, this often adds to teachers' workload. Since the teacher is usually the main feedback provider, this leads to an increase in teacher workload in a larger classroom, and thus quality of feedback becomes a challenge (Bouzidi & Jaillet, 2009; Van der Pol, Van den Berg, Admiraal, & Simons, 2008). Large classes hinder the implementation of individualized and immediate feedback since it places great demands on teachers' and other feedback providers' effort and time (Ballantyne, Hughes, &

Mylonas, 2002; Davies, 2000; Falchikov, 2004; Kulkarni, Wei, Le, Chia, & Papadopoulos, 2013).

Alternative feedback approaches exist which enable the provision of individualized and time-intensive support for student learning. Peer assessment is one of many approaches to feedback that have been integrated in course designs. In the next section I review peer assessment, and particularly the peer feedback approach.

3.2. Peer Assessment

Peer assessment is most often used in post-secondary education settings (Lin et al., 2001; Thanh & Gillies, 2010), although it has been applied in the K-12 education setting as well. It has been adopted in courses in diverse subjects, including courses in business, medicine, design, science, and social science (Tseng & Tsai, 2007). Peer assessment has been viewed by many scholars as an effective assessment approach that integrates self-directed and collaborative learning (Loureiro, Pombo, & Moreira, 2012). In his review of peer assessment studies, Topping (1998) observed that peer assessment helps students recognize their knowledge gaps by identifying their errors and misconceptions, and discover possible solutions through "explaining, simplifying, clarifying, summarizing, reorganizing, and cognitive restructuring" (p. 256). Moreover, various beneficial facets of peer assessment for student learning have been identified. For instance, peer assessment helps students acquire valuable skills for learning such as monitoring peers' work and evaluating the gap between their actual level of performance and a standard level. Students also realize their new role and its purpose and develop higher self-efficacy (Looney, 2011). Besides that, numerous benefits of peer assessment have been reported in cognitive, metacognitive, and emotional dimensions of learning (Dochy, Segers, & Sluijsmans, 1999; Lu & Law, 2012; Topping, 1998). Most notably, a meta-analysis by Huisman et al. (2019) found peer assessment improves students' writing compared to no feedback (g = 0.91 [0.41, 1.42]), self-assessment (g = 0.33 [0.01, 0.64]), and teacher feedback (g = 0.46 [-0.44, 1.36]). Moreover, a meta-analysis by Zheng, Zhang, and Cui (2020) showed that technology-assisted peer assessment enhanced learning achievement (g = 0.58 [0.33, 0.82]) compared with other assessment approaches. The data also indicated a medium effect size on essay writing when technology-assisted peer assessment was integrated into an essay writing task (g = 0.62 [0.17, 1.7]).

The effects of peer assessment do not only apply to students' formal academic development but also their social skills. Peer assessment fosters social skills because it requires students to communicate, negotiate, be diplomatic, offer and accept criticism, rationalize their positions, and analyze and decline suggestions with objective eyes (Topping, 1998; Topping, Smith, Swanson, & Elliot, 2000). As a result of students' active involvement through peer assessment, they may develop life-long learning skills (Ballantyne et al., 2002).

Overall, peer assessment is an empirically supported and powerful approach to enhance student learning. It allows students to shift from being a passive learner to being active and autonomous. Moreover, many benefits from peer assessment have been reported such as promoting higher-order thinking, active and creative learning, and developing critical thinking, communication, and problem-solving skills (Topping, 1998). For these reasons, peer assessment is an increasingly important pedagogical strategy.

3.2.1. Types of Peer Assessment

While peer assessment has been adopted in diverse educational settings and its effectiveness has been recognized, no universal definition of peer assessment has been established. For instance, Topping (2017) states that peer assessment is "an arrangement for learners to consider and specify the level, value, or quality of a product or performance of other equal-status learners, then learn further by giving elaborated feedback and discussing their judgments with peers to achieve a negotiated agreed outcome" (p. 2). Falchikov (2005) explains that in peer assessment learners apply criteria and standards to assess their peers' work. It seems that Topping emphasizes reviewers providing a detailed description of the gap between expected and actual performance. In contrast, the definition by Falchikov seems to focus on pointing out the gap, but not necessarily on detailed description. These two authors are merely two examples of the many peer assessment definitions found in the literature. From a research perspective, varying definitions of peer assessment may reflect conceptual distinctions that could potentially be targeted in research designs. Researchers (Gielen, Dochy, & Onghena, 2011; Topping, 1998) have noted that inconsistent terminology often appears across the academic literature, where peer assessment is referred to as "peer marking, peer correction, peer rating, peer feedback, peer review, and peer appraisal" (Topping 1998, p. 250). Moreover, these terms have been often used interchangeably

(Gielen, Tops, et al., 2010; Hanlon, Murray, & Niculae., 2020), while others use them to distinguish different types of activities (Topping, 2017). For instance, some scholars used the term “peer assessment” to refer to a process for awarding a grade or score and “peer feedback” to refer to giving formative comments (e.g., Liu & Carless, 2006). Others refer to “peer feedback” as information for improving learning, which can involve both assigning grades and giving comments (e.g., Huisman et al., 2019).

The general inconsistency in definitions and use of terms makes it harder for educators and instructional designers to adopt evidence-based peer feedback activities. For instance, Topping (2017) distinguished 43 dimensions in relevant terminology. Using non-universal terms and not clearly indicating which dimension was used in research prevents scholars from judging which features of peer assessment contribute to an effective learning environment (Gielen et al., 2011; Topping, 1998; Van den Berg, Admiraal, & Pilot, 2006). It is, therefore, necessary to comprehensively clarify terms and different dimensions to avoid confusion (Gielen et al., 2011; Topping, 1998; Van den Berg et al., 2006).

To minimize confusion, some scholars have attempted to organize the dimensions into categories. Topping (1998) proposed a typology of peer assessment in higher education when he reviewed 109 peer assessment studies in higher education published before 1996. In the typology, he identified 17 categories of peer assessment. Since then, other scholars have proposed alternative typologies (Topping, 2017). For instance, Van den Berg et al. (2006) described only four categories. After reviewing peer assessment studies between 1997 and 2006, Gielen et al. (2011) proposed five categories and over 40 sub-categories. Van Gennip, Segers, and Tillema (2009) proposed three categories and 17 subcategories. As shown in Table 3.1, the items in Topping’s list grew to 43 items in 2017. While a consensus on a universal terminology may not be attainable, it is important for researchers to declare the key features of peer assessment adopted in any study, to make the research applicable and tangible (Topping, 2010; Van Gennip et al., 2009). In the next section, I will describe the important quantitative/qualitative dimension and how it relates to student learning.

Table 3.1 Variations in Peer Assessment

	Alternative A	Alternative B	Comment
1	Summative	Formative	or both
2	Quantitative grading	Qualitative feedback	or both
3	Single product	Several products	
4	Same kind of product	Different products	
5	Same curriculum area	Different areas	
6	Assessment criteria clear	Not clear	
7	Students involved	Student not involved	in defining criteria
8	Rubric used	Rubric not used	
9	Training given to peers	Not given	
10	Feedback positive	Feedback negative	or both
11	Feedback->improvement	No improvement	
12	Product reworked	Not reworked	
13	Scaffolding given	Not given	prompts, cues, etc.
14	Individuals	Pairs	or groups
15	One-way	Reciprocal	or mutual in group
16	Matching deliberate	Matching random	or matching accidental
17	Matching academic	Matching social	or both
18	Same year of study	Different year of study	
19	Same class	Different class	
20	Same ability	Different ability	in this subject area
21	Previous experience	No previous experience	
22	Experience positive	Experience negative	or both
23	Cultural expectations +ve	Negative	
24	Gender balance	Gender imbalance	ability, motivation, etc.?
25	Information technology	No IT	wholly or partly used?
26	In class	Out of class	or both
27	Length of sessions		
28	Number of sessions		
29	Objectives		Cognitive, metacognitive
30	Justification to peer	No justification	
31	Confidentiality	No confidentiality	to pair + teacher
32	Process monitored	Not monitored	
33	Reliability moderated	Not moderated	and validity
34	Task simple or complex		or simple→complex
35	Feedback expected		quantity + quality
36	Feedback objective	Feedback subjective	or both
37	Revisions many	Revisions few	
38	Intrinsic rewards	Extrinsic rewards	neither
39	Aligned	Non-aligned	with other assessment
40	Transferable skills	None measured	

	Alternative A	Alternative B	Comment
41	Evaluated	Not evaluated	
42	Voluntary	Or Compulsory	
43	Anonymous	Non-anonymous	

Note. Retrieved from "Peer Assessment: Learning by Judging and Discussing the Work of Other Learners," by Topping, 2017, Interdisciplinary Education and Psychology, 1(1), p. 6.

3.2.1.1. Peer Rating (Quantitative) versus Peer Feedback (Qualitative)

The quantitative-qualitative distinction indicates the type of reviewer response provided in the peer assessment process (Gielen et al., 2011). A quantitative assessment uses numbers only (e.g., peer rating or peer grading), whereas a qualitative assessment uses feedback comments as an assessment tool (Topping, 2017). In most peer assessment studies, the term peer assessment refers to a quantitative assessment, which includes a peer rating or peer grading with or without a qualitative component. The term peer feedback, on the other hand, refers to a purely qualitative assessment (Hanlon et al., 2020). In this thesis, the term peer feedback refers to a solely qualitative assessment and peer rating refers to a solely quantitative assessment. Peer assessment refers to peer rating, peer feedback, or a combination of the two.

Both peer rating and peer feedback have advantages for learning improvement. One of the advantages of peer rating is that it helps students to judge the magnitude of the gap between their current level of performance and the required level (Li, Steckelberg, & Srinivasan, 2008). To provide an accurate rating, students need to pay attention to and comprehend assessment criteria provided in assessment rubrics (Lu & Law, 2012). A study by Orsmond and Merry (1996), found students believed peer rating helped them become more critical in their work, and focus on structure. Davies (2004) reported that the peer rating process helped students to expand their subject knowledge. Other peer rating studies noted that when a student knows they are being assessed by their peers they become motivated to impress them (Hanrahan & Isaacs, 2001; Pope, 2001). Many studies evaluating the validity and reliability of peer rating have found it to be a valid assessment method (Falchikov & Goldfinch, 2000; Lu & Law, 2012). A meta-analysis of 48 studies that compared the scores provided by experts and peers found that peer rating tends to have high validity (Falchikov & Goldfinch, 2000).

Peer feedback, as defined by Lu and Law (2012), provides comments that describe the strengths and weaknesses of peers' work and offers ideas for improvement

that may enhance student learning. Lin et al. (2001) argued that detailed and immediate peer feedback can help students avoid unnecessary mistakes and learn strategies to improve their work. Moreover, Topping, Smith, Swanson, and Elliot (2000) asserted that high quality, individualized feedback facilitates both cognitive and meta-cognitive learning. Lundstrom and Baker (2009), moreover, found constructing feedback boosted peer reviewers' own performance on writing assignments.

Although peer rating and peer feedback each have advantages, most scholars assert the greater value of peer feedback (e.g., Davies, 2006; Ellman, 1975; Falchikov & Goldfinch, 2000; Holroyd, 2000; Liu & Carless, 2006; Topping et al., 2000). Some research has found no benefit or negative outcomes from peer rating. For instance, Sadler and Good (2006) found peer rating did not affect middle school students' performance in science tests, even though the correlation between teachers' ratings and peers' ratings in previous tests was high. Patton (2012) reported after their analysis of focus group interviews that peer rating was a major factor in provoking undergraduate students' antipathy. Kaufman and Schunn (2011) found undergraduate students negatively perceived an online peer rating experience if an additional rating by experts was not provided. In research by Cheng and Warren (1997), engineering students reported via a questionnaire and interview that they were not comfortable or confident rating peers' performance. A survey of 1740 Hong Kong postsecondary students revealed that 65% of students were skeptical about the relevance of peer rating for helping them learn (Liu & Carless, 2006). The researchers suggested that incorporating peer feedback alongside peer rating could improve students' attitudes toward peer rating.

In contrast, peer feedback has been accepted as a more beneficial approach to peer assessment. Nicol et al. (2014) found 86% of undergraduate students considered the peer feedback process to be a positive experience. The authors attributed this result to the absence of a peer rating component in the peer assessment process. A meta-analysis by Li, Xiong, Zang, Kornhaber, Lyu, Chung, and Suen (2016) analyzed 69 peer assessment studies which compared peer rating to expert rating. They reported that providing peer feedback in addition to peer ratings increased the correlation between peer and teacher ratings. Moreover, two meta-analyses (Huisman et al., 2019; Li et al., 2016) revealed the effectiveness of peer feedback as a feature in peer assessment designs. Thus, the peer feedback approach deserves careful attention.

3.3. Two Beneficiaries of Peer Feedback

While the effectiveness of peer feedback is confirmed by empirical studies, the mechanisms underlying effective feedback by peers as well as experts are complex and remain to be fully elucidated (Hovardas, Tsivitanidou, & Zacharia, 2014; Nelson &Schunn, 2009). This raises the question of how peer feedback activity affects writers' and reviewers' learning. In the peer assessment process students take on two roles: writer (also known as assessee) and reviewer (also known as assessor) (Cho & MacArthur, 2011; Hovardas et al., 2014; Topping 1998). Each role requires specific skills (Gielen & De Wever, 2015). Reviewers provide feedback on writers' work, whereas writers receive the feedback and use it to inform revisions to their work. Students, therefore, need to act differently in the peer feedback process depending on their role at a specific time. Hovardas et al. (2014) pointed out that the skills required of a reviewer and a writer are not same. According to them, the assessment skills which are necessary as a reviewer include "defining criteria, judging the performance of a peer, and providing feedback" (p. 135). In contrast, Hovardas et al. stated that a writer is required to use skills which include inspecting received peer feedback with a critical eye, choosing feedback pertinent to the goal of improvement, and making appropriate changes. Although peer feedback should ideally be beneficial for both writers and reviewers (Topping, 1998, 2005, 2009), studies reveal that the effects of peer feedback on learning differ depending on the role (reviewer or writer) in the peer feedback activity (Lu & Law 2012).

3.3.1. Reviewers

3.3.1.1. Benefits for Reviewers

In the traditional qualitative feedback approach, students merely benefit in their role as writers, since the reviewer's role is usually played by teachers or tutors (Nicol et al., 2014; Sadler, 2010). Looking beyond that tradition, various studies have investigated the relationship between peer reviewing activity and improvement of reviewers' ability. For instance, Li, Liu, and Steckelberg (2010) reported that undergraduate reviewers' performance in a final project for an educational technology course improved when they provided higher quality feedback. Althauser and Darnall (2001) found an association between the quality of feedback produced by undergraduate peer reviewers and the

quality of their final papers for a course. Although it seems likely that students who are inherently more motivated and capable than their peers will always tend to write better peer feedback and better final essays than their peers, the researchers claimed that the reviewing process was a predictive factor in improving the reviewers' writing. Similarly, Tsai, Lin, and Yuan (2002) found the more effort preservice teacher reviewers made in peer reviewing and the more critical thinking they exhibited in that process, the greater their improvement in writing. Students, therefore, can obtain additional benefit as reviewers in the peer feedback activity.

The benefit gained by students accrues through two processes: (1) the process of reading peers' work and (2) the process of reviewing, which involves more than merely reading others' work. The first process, "reading-as-the-reader," helps peer reviewers develop their writing ability and their learning skills through understanding texts from the readers' viewpoint, comparing good and poor writing examples with their own writing, and constructing cognitive representations of good and bad writing (Cho & Cho, 2011; Hovardas et al., 2014; Patchan & Schunn, 2015). In fact, "reading-as-the-reader" has been endorsed as a general writing strategy. Holliway (2004) described "reading-as-the-reader" as a strategy that assists writers to improve their writing skill. He explained that writers incorporate three "mental representations" (p. 335) when they read their own written work as a reader: (a) "What do I want to say?" (b) "What have I written?" (c) "How will the reader interpret my writing?" He also stated that acting as a reader during the revision process is important for understanding readers' needs. In peer feedback, reviewers naturally take the reader's role, and therefore implement this strategy intuitively. This process also leads reviewers to use various important skills such as understanding and anticipating readers' reactions, and competently interpreting others' work (Cho & Cho, 2011) to support their learning. Moreover, through this process reviewers can develop mental models of good and bad writing (Patchan & Schunn, 2015), diversify their inner resources, and establish a standard to evaluate their own work (Hovardas et al., 2014).

While the reading process may support peer reviewers' learning, one point of caution is that merely reading peer's work does not necessarily help student learning. For instance, Cho and MacArthur (2011) investigated the effect of peer reviewing in an undergraduate physics course. They evaluated students' writing quality in three intervention groups: a reviewing group, a reading group, and a control group. The

reviewing group read sample student writings and provided ratings and feedback comments. The reading group read sample student writings but provided neither ratings nor comments. The control group read unrelated articles. After each intervention activity, students wrote a physics lab report that was used to evaluate their writing. The researchers found that writing quality was higher in the reviewing group than the other groups. Moreover, three reviewer-related factors (the number of comments, the number of comments describing problems, and the number of comments including suggestions) were correlated with the writing quality of the reviewers.

The second process mentioned earlier, in which reviewers construct evaluative comments, further enhances peer reviewers' learning opportunities (Cho & MacArthur, 2011). This process, which can be called "learning by assessing" (Topping, 1998, p. 254), helps peer reviewers exercise and improve their skills. The reviewing process requires multiple distinct cognitive operations that rehearse peer assessment skills. These include specifying evaluation criteria, determining the quality of performance, and generating feedback (Hovardas et al., 2014; Sluijsmans, 2002). According to Topping (1998), reviewing calls on a variety of cognitive operations such as "thinking, comparing, contrasting, and communicating" (Topping, 1998, p. 254). Adding to these, Van Lehn, Chi, Baggett and Murray (1995) identified the reviewing operations of "summarizing, clarifying, giving feedback, diagnosing misconceived knowledge, identifying missing knowledge, and considering deviations from the ideal" (as cited in Topping, 1998, p. 254). Cho and MacArthur (2011) also identified and explained four primary reviewing operations: "defining the task, detecting problems, diagnosing problems, and selecting a revision strategy" (p. 594). These extensive lists of reviewing operations indicate that the reviewing process exercises various cognitive processes that are essential aspects of writing competence (Cho & MacArthur, 2011; Hovardas et al., 2014; Patchan & Schunn, 2015). Furthermore, Cho and Cho (2011) argue that the reviewing process is a constructive learning activity which creates ideas in relation to the given information and thereby enhances reviewers' knowledge development in addition to their writing skills.

3.3.1.2. Challenges and Difficulties Faced by Reviewers

Several studies have indicated that peer reviewers' learning depends on the quality of feedback which they constructed (e.g., Althauser & Darnall, 2001; Li et al., 2010). That is, benefits to peer reviewers are only evident when they construct high

quality feedback. In other words, mere construction of feedback does not necessarily affect reviewers' learning. In addition, the quality of feedback affects not only reviewers' but also writers' learning. Crisp (2007) asserted that we cannot assume students use feedback effectively, even when it is provided by experts. Working with undergraduate social work students, she investigated the impact on students' utilization of feedback provided by expert assessors and reported that there was no significant difference between students' scores on two essays (each due date was six weeks apart) which used the same format and evaluation criteria. If writers do not respond effectively to feedback from experts, then we should not assume they will do better with feedback from peers.

Writers' unfavorable perception of peer reviewers' ability to construct feedback is a related challenge faced by peer reviewers. Nicol et al. (2014) discovered from focus group discussions that students were concerned about receiving low quality peer feedback, although in a post-feedback survey the majority (84%) said the quality of peer feedback they received was good or fair. In another study (Mulder, Baik, Naylor, & Pearce, 2014), most students said the peer feedback they received was useful, although they also expressed concerns about the usefulness of received peer feedback during the focus group discussion. It appears that students' concern about the quality and helpfulness of peer feedback is more prominently expressed in interviews than in surveys. This raises questions about what type of peer feedback is helpful for student learning. The type of feedback comments generated and provided by peers is recognized as a key factor in the effectiveness of peer feedback (Cho, Schunn, &, 2006; Lu & Law, 2012; Topping, 1998; Tseng & Tsai, 2007). The relationship between the type of feedback and its helpfulness is complex, even for feedback provided by teachers (Ferris, 1997). When feedback is provided by peers, the outcomes are likely to be even less consistent and predictable. A comprehensive understanding of the effects of different types of peer feedback is therefore crucial to guiding peer reviewers in the production of truly helpful feedback (Nelson & Schunn, 2009). The benefits and challenges affecting reviewers are summarized in Table 3.2.

Table 3.2 Benefits and Challenges of Peer Feedback for Reviewers

Benefits
Improving written work up on the provision of high-quality peer feedback[a] and exhibiting critical thinking during the peer feedback process[b]
Leading to knowledge development[c]
Involved processes
Reading-as-the-reader
Developing writing ability and learning skills (e.g., understanding texts from the readers' viewpoint, comparing good and poor writing examples with their own writing, and constructing cognitive representations of good and bad writing)[d]
Incorporating "mental representations" ((a) What do I want to say? (b) What have I written? (c) How will the reader interpret my writing)[e]
Understanding readers' needs[f]
Anticipating readers' reactions[g]
Interpreting others' work[h]
Diversifying inner resources[i]
Establishing a standard for self-evaluation[j]
Learning by assessing
Performing cognitive operations (e.g., specifying evaluation, comparing, contrasting, detecting problems, diagnosing, generating feedback)[k]
Creating ideas in relation to the given information[l]
Challenges
Mere feedback construction does not lead to learning[m]
No guarantee on writers' use of provided peer feedback[n]
Unfavourable perception of peer reviewers' reviewing ability by writers[o]

[a]Li et al. (2010); Althauser & Darnall (2001). [b]Tsai et al. (2002). [c]Cho & Cho (2011). [d]Cho & Cho (2011); Hovardas et al. (2014); Patchan & Schunn (2015). [e]Holiway (2004). [f]Holiway (2004). [g]Cho & Cho (2011). [h]Cho & Cho (2011). [i]Hovardas et al. (2014). [j]Hovardas et al. (2014). [k]Chi et al. (1995); Cho & MacArthur (2011); Hovardas et al. (2014); Sluijsmans (2002); Topping (1998). [l]Cho & Cho (2011).

3.3.2. Writers

3.3.2.1. Benefits for Writers

The benefits of peer feedback for writers are well documented in the literature (e.g., Chen & Tsai, 2009; Cho & MacArthur, 2010; Nelson & Schunn, 2009; Topping, 1998). One benefit is the language used by peer reviewers. Weaver (2006) investigated undergraduate students' perception of expert feedback on their writing and found that many students did not understand the feedback they were given. In contrast, a peer reviewer constructs qualitative feedback from a student's viewpoint; therefore, the language they use in their comments is more recognizable and possibly more meaningful for writers (Cho & MacArthur, 2010; Falchikov, 2005; Hovardas et al., 2014; Nicol et al., 2014; Topping, 1998). This effect is especially beneficial for English as a

Second Language (ESL) students. In Zhao's (2010) study, only 58% of the feedback provided by experts was understood and used by ESL writers. On the other hand, the writers understood and used 83% of feedback they received from peer reviewers.

Peer feedback enables writers to receive feedback faster than they typically would from a teacher (Gielen, Tops, et al., 2010). According to Gielen, Tops, et al. (2010), teachers often struggle to supply feedback quickly, since they receive assignments or exams from all students at once. On the other hand, writers can receive peer feedback in a more timely manner, even though it is not perfect. Gielen, Tops et al. also stated that the unequal power balance between teachers and students may prevent students from sharing their emotions, identity, and experiences (such as their previous academic performance) with teachers. However, peer feedback may reduce issues arising from power imbalances and allow writers to be more comfortable showing their weaknesses and confusion.

Another advantage that writers obtain from peer feedback is the volume of comments they receive from multiple peer reviewers (Topping, 1998; Topping, 2009). It is a common feature of peer feedback systems that writers receive feedback from multiple reviewers. Feedback from multiple reviewers leads to better writing, as it exposes writers to diverse perspectives. In the traditional approach, writers only receive the single perspective available from the teacher (Topping, 1998). A study of group peer feedback by Chen and Tsai (2009) reported that groups who received more peer feedback were more likely to improve their writing in a research proposal submitted as a group project. Cho and Schunn (2007) compared three feedback conditions experienced by undergraduate student writers: a single peer reviewer, multiple peer reviewers, and a single expert reviewer. Those who received feedback from multiple peer reviewers showed the greatest improvement in their writing. In similar research by Cho and MacArthur (2010), writers receiving feedback from multiple peer reviewers were more likely than those with a single peer or expert reviewer to make complex revisions that elaborated and expanded upon the ideas in their original version. Some of the strongest supporting evidence is the result of a meta-analysis on postsecondary peer assessment (Huisman et al., 2019) which obtained a much greater effect size for multiple reviewers (g = 1.00 [0.28, 1.72]) than single reviewers (g = 0.37 [0.23, 0.51]).

3.3.2.2. Challenges and Difficulties Faced by Writers

While the effectiveness of peer feedback for writers has been reported, writers still face some challenges to reap its benefits. As mentioned above, writers have concern about peers' feedback (Mulder et al., 2014; Nicol et al., 2014). Some scholars (e.g., Min, 2003; Patchan & Schunn, 2016) noted that writers do not necessarily use peer feedback during their revision process. Ignoring feedback from peers may be due to writers' strong ownership of their written work, unclear feedback from reviewers (Min, 2003), or writers' selective behavior towards peer feedback based on the ease of the suggested revision (Patchan & Schunn, 2016). To receive maximum benefit from feedback, a writer is expected to be a "proactive recipient" (Winstone et al., 2017, p. 17). According to Winstone et al. (2017), writers need to engage in feedback processes so they can take responsibility for and actively contribute to their own learning. The table below shows a summary of benefits and challenges of peer feedback for writers.

Table 3.3 Benefits and Challenges of Peer Feedback for Writers

Benefits
Language in feedback used by peer reviewers is more recognizable and more meaningful for writers[a]
Receiving feedback from a peer reviewer quicker than an expert reviewer[b]
Sharing writers' emotions, identity, and experiences with peer reviewers more likely than with expert reviewers due to unequal power balances between writers and peer reviewers[c]
Receiving a larger amount of feedback from multiple peer reviewers than an expert reviewer[d]
Challenges
No guarantee of writers' use of provided peer feedback due to the strong ownership possessed by writers, writers' selective behavior towards peer feedback, and unclear feedback from peer reviewers[e]

[a]Weaver (2006); Cho & MacArthur (2010); Falchikov (2005); Hovardas et al. (2014); Nicol et al. (2014); Topping (1998). [b]Gielen, Tops, et al. (2010). Gielen, Tops et al. (2010). [d]Chen & Tsai (2009; Cho & MacArthur (2010); Cho & Schunn (2007); Huisman et al. (2019); Topping (1998); Topping (2009). [e]Min (2003); Patchan & Schunn (2016).

3.3.3. Who Receives Greater Benefit from Peer Feedback Activities?

The benefits of peer feedback for reviewers and writers have been clearly articulated on theoretical grounds. The research evidence, however, has been inconsistent. Several studies examined the perceived and actual benefits of peer feedback and how they differed for the writer and reviewer. Some found no difference between writers and reviewers in the perceived benefits (Cao et al., 2019; Nicol et al., 2014) or in performance (Huisman, Saab et al., 2018). Cao et al. (2019), investigated 30 Chinese undergraduate ESL students' perceptions of the group peer feedback process

from the perspectives of the two roles. Only four students acknowledged the benefits from peer feedback as a writer, three students did so as a reviewer, and one student did not perceive any benefits either as a writer or a reviewer. However, most students perceived that the peer feedback process helped their learning through both the writer's and the reviewer's role together. In research on undergraduate students in the Netherlands, Huisman, Saab et al, (2018) found that the improvement of writing performance was similar for writers and reviewers. In a study of engineering students who had participated in a peer feedback process, 55% said both roles helped them to learn, 27% said the writers' role was more helpful, and only 11% said the reviewers' role was more helpful (Nicol et al., 2014).

I was unable to identify any studies which found more benefit for writers than reviewers; however, much other research has reported that reviewers received more benefit from the peer feedback process (e.g., Althauser & Darnall, 2001; Lundstrom & Baker, 2009; McConlogue, 2015; Tsui & Ng, 2000). For instance, Lundstrom and Baker (2009) compared the benefits from the peer feedback process for writers and reviewers attending an undergraduate English writing program. The giver group who provided peer feedback but did not receive it improved their writing quality more than the receiver group who only received peer feedback but did not construct feedback. This trend was more significant among the givers in the beginning level course than those in the intermediate course. Tsui and Ng (2000) reported that ESL secondary students in Hong Kong held a more positive perception of a reading-as-the-reader process than reading received feedback. In an in-depth case study by McConlogue (2015), an undergraduate student explained that the reviewing process was helpful because she could reflect back on her own work and learn from both good and poor written work by peers. She reported her experience as the feedback recipient was not as helpful. She was confused by her peers' comments, since most of them were vague, unclear, inaccurate, or lacking specific direction for improvement. Althauser and Darnall (2001) found the quality of peer feedback was positively related to the quality of the reviewers' final papers but was unrelated to the quality of the writers' final papers.

In fact, a considerable number of studies have reported no significant effects of peer feedback on writers. For example, Li et al. (2010) examined the relationship among four variables (initial project score, final project score, quality of generated peer feedback, and quality of received peer feedback) for undergraduates in a teacher

education program. They found the quality of received peer feedback did not significantly affect writers' performance. Cho and Cho (2011) reported that the quality of the revised written work by physics undergraduate students was not influenced by the peer comments they received but was influenced by the types of peer comments they constructed.

It therefore appears that the effectiveness of peer feedback for supporting writers' learning is viable only under limited conditions (Gielen, Peeters, et al., 2010). In particular, the benefit to writers is contingent on the quality of the peer feedback they receive, a factor which is not under their control. In contrast, the benefit to reviewers is more reliable, and is more under their control as they can boost their gains by devoting greater time and effort to generating constructive feedback (Van der Pol, Van den Berg, Admiraal, & Simons, 2008). Hamer et al. (2015) even stated that students predominantly receive benefits as a reviewer, and any positive effects on writers from peer feedback should be considered just as "a bonus" (p. 162). It seems that further research is necessary to resolve the unbalanced benefits between reviewers and writers. Having discussed the disadvantages of the writers' role in the peer feedback process, the next section discusses how to address the challenges writers face.

3.4. Use of Peer Feedback

In general, students' dissatisfaction with the feedback they receive may be a significant factor in their lack of engagement with it (Boud & Molloy, 2013b). The dissatisfaction also could be a phenomenon that appears in the peer feedback setting. For instance, Walker (2015) discovered that 51% of undergraduate students did not make changes in the areas where peer reviewer feedback indicated revisions were necessary. Patchan and Schunn (2016) reported undergraduate students in a Psychology course used only approximately 30% of the feedback they received from peers. Patchan, Schunn, and Correnti (2016) also found that undergraduate students in an Introductory Psychology course used only 41% of peer feedback for their revision. Similarly, Min (2003) found ESL undergraduate students did not address 64% of the suggestions provided by peer reviewers in their revisions. These findings make it clear that writers' use of peer feedback tends to be unreliable and limited (Gibbs & Simpson, 2004; Nicol, 2010; Price, Handley, & Millar, 2010). In previous sections, I reviewed two of the four factors that affect writers' use of general feedback: receiver (3.1.1.3) and

feedback message (3.1.1.2). In the remaining sections of 3.4, I discuss how these factors affect writers' use of peer feedback.

3.4.1. Messages in Peer Feedback

As was pointed out in the section on the effect of messages in general feedback (3.1.1.2), the impact of the quality of feedback on students' use of feedback is widely accepted. It is the same in peer feedback (Min, 2003). If writers think the feedback is helpful, they are much more likely to adopt it (Strijbos, Narciss et al., 2010). Writers acknowledge that peer feedback generally provides basic information, and the level of quality is variable (Vu & Dall'Alba, 2007). Unfortunately, the quality of peer feedback tends not to be high, since peers do not have expert knowledge and peer reviewers are not given enough training to construct high-quality feedback (Cho & Schunn, 2007).

The peer feedback literature indicates that effective feedback messages from experts and peers have similar characteristics. Lin et al. (2001) found that students who received specific feedback outperformed those who received holistic feedback. Strijbos, Narciss et al. (2010) also found that detailed and specific comments enabled high-competence writers to quicken their revision process. However, this result did not apply to low-competence writers. In addition, directive feedback has been shown to increase students' perception that the peer feedback and the peer assessment process promotes learning (Cho et al., 2006; Cho & Cho, 2011). On the other hand, Yu and Wu (2013) found that high-quality feedback which describes strengths and weaknesses and offers suggestions for improvement raised students' performance regardless of whether the feedback comments were specific or general. Walker (2015) reported that undergraduate student writers tend not to use peer feedback that is vague and less detailed.

3.4.1.1. Types of Peer Feedback

A considerable amount of research on both expert and peer feedback has attempted to categorize comments in various ways (Cho & Cho, 2011; Nelson & Schunn, 2009). Some studies focused on the cognitive, affective, and/or meta-cognitive functions of comments. Examples of cognitive functions mentioned in the literature are identification of the problem, offering a solution, localization, and explanations. Examples of affective functions are praise and criticism. Examples of meta-cognitive functions are

evaluating and reflecting (Chen & Tsai, 2009; Cheng, Liang, & Tsai, 2015; Gielen, Tops et al., 2010; Lu & Law, 2012; Nelson & Schunn, 2009; Tsai & Liang, 2009). Other studies paid attention to specificity (identifying problems, providing solutions, specifying problem locations or areas) (Gielen, Peeters, et al., 2010; Lin et al., 2001; Strijbos et al., 2010; Tsai et al., 2002), scope (local vs. global; narrow vs. holistic) (Cho & Cho, 2011; Min, 2005; Strijbos et al., 2010), and basic/advanced (basic: confirmation, expansion, replacing, overwriting; advanced: tuning, restructuring) (Liu & Lee, 2013). Furthermore, several scholars researched the quality of feedback in general (Liu & Lee, 2013; Tsai et al., 2002; Yu & Wu, 2013).

Various peer feedback studies conducted comment analysis and developed comment coding schemes. No standard categorization has been established, and each study used different coding categories. I will examine next the affective and cognitive categories in more detail.

3.4.1.1.1. Affective

As affective peer feedback comments can often be either complimentary and enthusiastic about the writer's work or negative and critical (Cheng et al., 2015; Lu & Law, 2012), they have the potential to influence the writer's motivation, effort, and engagement (Hattie & Timperley, 2007). In Lu and Law's (2012) words, the affective category reflects the quality of the writers' work by showing agreement or disagreement, or providing positive (e.g., praise) or negative (e.g., opposing) comments. Several studies investigated comments that provide support for writers' work and imply a positive emotional response from the reviewer (e.g. Chen & Tsai, 2009; Tsai & Liang, 2009). Other studies of reviewer affect included both positive and negative comments (e.g., Cho et al., 2006; Hovardas et al., 2014).

The impact of affective comments on writers has not been clearly confirmed. Some feedback research concluded that affective comments did not influence writers' learning (e.g., Ferris, 1997; Hattie & Timperley, 2007). Cho and Cho (2011) reported that the quality of a revised laboratory report was reduced when undergraduate students in physics received more positive affective comments about language mechanics and expression. However, several other peer feedback studies found that learning was enhanced by affective comments. For instance, Lu and Law (2012) indicated that positive affective comments improved writers' performance. Cho et al. (2006) found

comments featuring praise led writers to perceive the peer feedback as more helpful. Cheng et al. (2015) observed that praiseful comments encouraged writers to participate in the process and report greater motivation, unfortunately without improving their performance. Patchan et al. (2016) found that praise comments enhanced writers' revision behavior, even though the comments did not affect their revision outcome.

3.4.1.1.2. Cognitive

The cognitive function of comments has been investigated by research which used a variety of comment descriptors (Cheng et al., 2015; Hattie & Timperley, 2007; Lu & Law, 2012). For instance, Nelson and Schunn (2009) selected four cognitive comment types to investigate comments that improve peers' writing performance: summarization, specificity, explanation, and scope. Other studies used correction, personal opinion/advice, and guidance (e.g., Chen & Tsai, 2009; Cheng et al., 2015; Tsai & Liang, 2009) and identifying problem, suggestion, explanation, and language (Lu & Law, 2012) as cognitive categories. Cognitively oriented feedback comments have been repeatedly reported in previous research as positive predictors of writers' learning.

Problem Identification

According to Nelson and Schunn (2009), pointing to a problem in the writing can be classified as an explicitly identified critique. They also explained that problem identification is key to improving feedback specificity. They found that writers enhanced their revision behavior when they understood the problems identified by reviewers. Problem identification comments were a key component of feedback which enhanced writers' understanding of the problem (Nelson & Schunn, 2009). It is important to note that merely pointing out problems does not provide positive effects on writers' performance (Lu & Law, 2012). Nelson and Schunn (2009) found writers did not use the received feedback if they did not understand the identified problem. To improve writers' understanding of problem identification feedback, Lu and Law (2012) suggested including explanations.

Suggestions/Solutions

Feedback that includes suggestions or solutions provides writers with a prompt for improving their writing (Cho & MacArthur, 2011). The effectiveness of these comments has been identified in various studies. Nelson and Schunn (2009) and

Patchan et al. (2016) reported that providing solutions positively affected the revision rate. Suggestions which included examples were preferred by medical practitioners receiving in-service training (Prins et al., 2006), and use of explicit suggestions was identified as a positive predictor of writers' perception that a comment was helpful (Cho et al., 2006). Moreover, feedback that included suggestions has been found to be positively correlated with the improvement of undergraduate students' subject knowledge accuracy (Cheng et al., 2015; Lin et al., 2001) and with tenth-grade students' successful completion of computer projects (Tseng & Tsai, 2007). Lu and Law's (2012) study, on the other hand, detected no beneficial effect of cognitive comments on student performance. The researchers attributed this result to lack of explanation, since suggestive feedback without explanations may not help low-ability students to judge whether they should implement the feedback or not.

Explanation

Explanations clarify, elaborate, or justify the problem identifications or directions generated by reviewers (Lu & Law, 2012; Nelson & Schunn, 2009). A justification is a comment that includes a statement explaining why a reviewer's feedback is reasonable. Research on explanatory feedback has reported mixed effects. Gielen, Peeters et al. (2010) found justification comments were effective in improving students' performance. Also, in the study by Huisman et al. (2018), writers perceived explanatory feedback as more helpful than feedback focusing on analysis, evaluation, or revision. On the other hand, some studies indicated no effect of explanatory feedback on writers' revision actions (Van der Pol et al., 2008) and performance (Lu & Law, 2012). Lu and Law (2012) attributed the lack of measurable benefit from explanatory feedback found in their research to its low frequency. In addition, a few studies reported a negative effect of explanatory comments. For instance, Tseng and Tsai (2007) concluded that didactic comments—"lengthy explanations with a lecture tone" (p. 1168)—harmed writers' performance. Nelson and Schunn (2009) found that providing explanations in the feedback comments negatively affected writers' understanding. Gielen, Peeters et al. (2010) also stated that explanatory comments hindered the learning of seventh-grade students who showed the best performance on a pretest, even while assisting those who scored lower on the pretest. Prior research on explanatory comments has had mixed outcomes. According to Nelson and Schunn (2009), peers' lack of reviewing ability may interfere with providing clear explanatory feedback, since students who received

corrective feedback with a written explanation from an expert outperformed students who did not receive corrective feedback in the study by Bitchner, Young, and Cameron (2005). Therefore, the effect of explanatory peer feedback may be affected by its quality.

Direct Correction

The term direct correction is used in the field of English as a Second Language (ESL) to refer to feedback as "the provision of the correct linguistic form or structure above or near the linguistic error" (Bitchener, 2008, p. 105). In other words, direct correction is feedback which merely provides correct answers without suggestions and/or explanations. The precise role of corrective feedback in human learning is not settled. Particularly in the field of ESL, it has received considerable attention (Bitchener, Young, & Cameron, 2005). Truscott (1996), a scholar who has opposed the use of corrective feedback, has claimed that that only a handful of studies found it is effective for teaching grammar. Other scholars argue it is too early to conclude that error correction should be abandoned as a teaching practise (e.g., Bitchener, 2008; Ferris, 2004).

Due to the inconclusive evidence regarding the effectiveness of the corrective feedback, several meta-analysis studies have been conducted. For instance, Kang and Han (2015) analyzed effects on grammatical accuracy among L2 learners. They found a moderate to large effect size for direct correction (Hedges's g = 0.68, SE = 0.13, CI = 0.42 ~ 0.93, $p < .0001$). Biber, Nekrasova, and Horn (2011) included both L1 and L2 studies and reported a relatively high effect of corrective feedback on grammatical accuracy (d = 0.77, SE = 0.77, CI = -0.19 ~ 1.73) among the studies that used a pretest-posttest design. However, the effect size was only moderate on holistic writing quality (d = 0.48, SE = 0.41, CI = 0.14 ~ 0.82). Among the studies which employed an experimental design, a small effect on grammatical accuracy was found (d = 0.22, SE = 0.19, CI = -0.03 ~ 0.46.

According to Mao and Lee (2020), the trend of recent studies shows the effectiveness of direct correction. They also stated that varying the strategy or the extent of corrective feedback can affect its benefits. Their review showed that multiple factors were responsible for the effectiveness of corrective feedback. For instance, comprehensive corrective feedback, which provides feedback on every error, had mixed

results. On the other hand, direct focused corrective feedback, which provides corrective feedback on one or a few selected error types, was effective.

In peer feedback research, only a few studies have investigated the relationship between students' performance and receiving direct correction (e.g. Chen & Tsai, 2009; Cheng et al., 2015). Cheng et al. (2015) investigated the relationship between students' improvement in writing performance and the types of peer feedback they received. The results showed that direct correction significantly improved the writing in students' biology reports. Chen and Tsai (2009) found direct correction from an expert helped graduate students improve their proposal writing. However, a similar result was not found when students received corrective feedback from peer reviewers.

The complexity of what feedback writers find useful has led to inconsistent research findings about peer feedback characteristics and writers' performance. Therefore, it is not enough to focus on solely on the effect of feedback on writers' performance and revision actions. Identifying what writers want from peer reviewers is needed as well. A premise of this thesis is that research which investigates what feedback is seen as useful by writers and what they want from reviewers will expand our understanding of the peer feedback process.

3.4.2. The Role of Writers' Individual Differences in the Peer Feedback Process

The three influential learner characteristics (learning ability, prior experience, and receptivity to feedback) introduced by Lipnevich et al. (2016) not only mediate students' use of feedback in general, but also mediate the use of peer feedback. In the peer feedback setting, students' ability, experience, and perceptions of peer feedback have also been studied.

One might imagine that how the abilities of writers and reviewers are matched may affect the success of peer feedback activities. Huisman et al. (2017) assigned undergraduates to dyads and had each member of a dyad review and give peer feedback on the other's draft essay. Dyads were classified as homogenous (the members of a dyad had similar ability levels) and heterogenous (the members of a dyad had different ability levels). Using improvement from draft to final essay as the dependent variable, they reported that the writer's ability level, the reviewer's ability

level, and the dyad composition all had no effect on performance gain. On the other hand, Patchan and Schunn (2016) examined the benefits to undergraduate writers of receiving feedback from peers of varying ability level. They summarized their central findings as follows:

> Often lower-ability writers benefitted more from receiving feedback from lower-ability reviewers, while higher-ability writers benefitted equally from receiving feedback from lower-ability and higher-ability reviewers. This result leads to the practical recommendation of grouping students by ability during peer assessment, contrary to student beliefs that only feedback from high ability peers is worthwhile. (p. 227)

Although the higher-ability reviewers tended to produce higher quality comments, their comments may also have been more cognitively demanding for writers. According to the authors, lower-ability writers may not have had the skills needed to process the more cognitively demanding feedback produced by higher-ability reviewers.

Writers' ability affects their use of peer feedback. Lu and Law (2012) found that high school students whose subject-related course scores in the previous term were low received less benefit from peer feedback on their writing than students with better performance in the previous term. Lu and Law explained that low ability students struggle in understanding, analyzing, and implementing the feedback they are given. In research conducted with Taiwanese undergraduate students, Lin et al. (2001) analyzed the effect of students' executive thinking style on their performance gain after two rounds of peer feedback. High executive thinkers (who are ostensibly more rule-oriented) showed greater improvement and higher second round scores than low executive thinkers (who are ostensibly less rule-oriented). Patchan and Schunn (2016) claimed that poor writers tend to choose less cognitively demanding revision strategies to meet a looming deadline and that extensive revisions require more cognitive effort and time. They found lower ability writers tended to use feedback from reviewers whose writing ability was low. Mulder et al. (2014) also found through focus group interviews that students tended to use simple feedback which is easily addressed.

In contrast, some studies reported no difference between low and high ability writers in their learning performance. Patchan and her colleagues (Patchan & Schunn, 2016; Patchan et al., 2016) examined whether undergraduate students' writing ability affects their use of feedback. They developed an ability effects model for a peer

assessment setting. They explained that the writer's ability and the reviewer's ability are intricately related throughout the peer feedback process, but the writer's ability is the dominant factor in determining the number and quality of revisions. Therefore, they expected that high ability writers make a larger number and higher quality of revisions than low ability writers. However, the researchers found no association between writers' ability levels and the number of feedback comments implemented in their revision as well as the number and quality of their revisions. However, another result from the same study showed that writers' ability did relate to their implementation rate and revision quality when reviewers' ability was taken into account. High-ability writers used high-level feedback, which informs about high-level issues (e.g., main themes and connections) regardless of reviewers' ability. In contrast, low-ability writers used high-level feedback more from low-ability reviewers than high-ability reviewers. Walker (2015) investigated the relationships among undergraduate writers' ability levels (based on their scores from another assignment in the course), the types of peer feedback they received, and their revision rates. No relationship was found between writers' ability levels and their revision rates. There have been few empirical studies on the interaction between writers' ability and peer feedback interventions (Patchan et al., 2013), and it remains unclear how writers' prior ability affects their use of feedback.

A handful of studies analyzed the relationship between students' prior peer feedback experience and their attitudes toward it. Wen and Tsai (2006) examined both undergraduate and graduate students' attitudes towards online peer assessment in Taiwan. One of the subscales indicated that negative attitudes towards peer assessment were lower among students who had prior peer assessment experience. Kasch et al. (2021) investigated students' experience and perceptions regarding peer feedback in an undergraduate level MOOC course. Survey questions assessed willingness to participate in peer feedback activities, beliefs about the usefulness of peer feedback, preparedness to review peers' work, and attitudes (e.g., toward the learning benefits for writers). Their data showed the unexpected result that students who did not have peer feedback experience had greater willingness to participate in it and a more positive general attitude. The students who had prior peer feedback experience scored higher only in preparedness. There were no significant differences in perceptions of usefulness. The inconsistent results regarding writers' prior experience with peer feedback and their attitudes toward it suggest that further research is needed.

A writer's attitude towards the peer feedback they receive and their consequent revision behavior are influenced by their perception of the reviewer's level of competence (Strijbos, Narciss et al., 2010). Most studies analyzed students' attitudes toward peer assessment holistically and did not distinguish attitudes from the perspective of the respondent as a writer (e.g., Strijbos, Narciss et al., 2010; Wen & Tsai, 2006). There are very few studies focusing on writers' attitudes toward peer feedback. In one of these, Gielen and De Wever (2015) found that writers tended to see the quality of the peer feedback as sufficient, and they by and large accepted the idea that peer feedback helped them to improve their performance. On the other hand, some studies indicated a wider range of attitudes towards received peer feedback. For instance, Georgountzou and Calfoglou (2019) found writers in a distance learning master's program in TESOL held widely varying attitudes towards the peer feedback they received (interesting = 40%, helpful = 20%, straightforward = 18.2%, demanding = 7.3%, and unhelpful = 10.9%). Cho et al. (2006) investigated writers' beliefs about the helpfulness of peer feedback and found that directive and laudatory feedback was generally regarded as helpful. Summary feedback about the structure and quality of the argument in the writing was thought to be helpful, while critical feedback about the structure and quality of writing was seen as unhelpful.

3.5. Instructional Intervention

A great deal of research has investigated the qualities of effective feedback. While various theories about effective feedback have been proposed and studied, academic understanding of feedback has not been fully deployed to maximize its value for instructional practice (Haughney, Wakeman, & Hart, 2020). Research has clarified that benefits from the peer feedback process are not equal for writers and reviewers. While many benefits have been identified for reviewers, the benefits for writers have been more elusive. Research on the peer feedback experience of students is essential to resolve the imbalance in benefits obtained by writers and reviewers. There is, especially, an urgent need to maximize the value of peer feedback for writers.

In the specific case of peer feedback for student writers, strategies to provide the most effective and efficient peer feedback have likewise been proposed and studied. However, the complexity of written feedback and challenges faced by writers have been reported by many scholars. Moreover, most instructional interventions investigated in

previous research focused on reviewers, while research on interventions focused on writers has been scarce (Gielen, Peeters, et al. 2010). Two points need to be considered to determine the effectiveness of feedback: writers' engagement with reviewers and writers' use of feedback (Winstone et al., 2017). According to Winstone et al., the feedback process is "a communicative event" (p. 2026). It has been suggested that writers should have an opportunity to actively engage with the feedback process (e.g., Boud & Molloy, 2013a; Gibbs & Simpson, 2004). The writer-reviewer interaction during the feedback process is one of the key strategies to produce a more positive feedback experience (Boud & Molloy, 2013b). Nicol (2010) claimed that, for enhancing student learning, the quality of students' interaction within the feedback process is just as important as the quality of feedback.

To promote writers' engagement with feedback, they need to have an opportunity to share what they want from feedback (Gibbs & Simpson, 2004). It is crucial that educators and instructional designers provide such an opportunity to enhance writers' learning. Among many intervention strategies proposed by scholars, in this thesis, I focused on two intervention strategies: (1) prior questions, and (2) nomination and distribution of helpful feedback.

3.5.1. Prior Question Strategy

The prior question strategy, in which writers are given the opportunity to pose questions or express concerns about their writing to a peer reviewer before a review is prepared, assists writers by enhancing their engagement and communication in the peer feedback process. Writers are generally picky in choosing feedback they want to use (Patchan & Schunn, 2016). They naturally resist using the received feedback if they cannot readily see how to use it (Walker, 2009) or if it does not reflect their perceived needs (Boud & Molloy, 2013a). Sometimes, writers act on feedback about a part of their writing in which they were not confident, but do not act on feedback about a part of which they were confident (Shute, 2008). At other times, writers' use of feedback can be affected by the level of concern raised by reviewers in their feedback. Lower-order concerns are simpler and more easily fixed than the complex higher-order concerns (Ene & Upton, 2014). Higher-order concerns are harder for writers to address, since they require greater writing skills and knowledge (Van den Bos & Tan, 2019). Writers often

accept and act on feedback that is cognitively easier to implement and ignore feedback that requires them to make more complex decisions (Patchan & Schunn, 2016).

Since interpreting feedback is a complex task for writers, it is not easy for reviewers to know which of the comments they might provide will be accepted and used by writers (Price et al., 2010). Moreover, peer reviewers tend to pay attention to lower-order concerns such as writing mechanics during the reading process (Keh, 1990) and provide feedback regarding the lower-order concerns, since they are less cognitively demanding. Prior studies also reported that peer reviewers provided this type of feedback no matter how they were instructed and what intervention tools were provided (Patchan et al., 2009, 2013).

Nicol (2009) asserted that reviewers need to adjust their feedback based on writers' needs to make feedback useful and meaningful for them. He explained that such adjustment empowers writers to take a more active role as the feedback receiver and avoid reviewer-centered feedback. He also stated that it is quite difficult for reviewers to know the appropriate level of specificity and detail in advance. Thus, to improve writers' use of feedback, it is more important for reviewers to consider writers' perceived needs as they create feedback rather than to focus on specificity or detail. Knowing what writers want from feedback enables reviewers to construct more useful feedback (Gielen, Tops, et al., 2010). In addition, writers' active sharing of their needs in the peer feedback process should be promoted to improve their feedback experience (Prins, Sluijsmans, & Kirschner, 2006). Prins et al. (2006) stated that active involvement in the peer feedback process allows writers to solicit actionable and explanatory feedback and to more easily judge if the received feedback is addressing their needs. This reflective process is called "mindfulness" according to Bangert-Drowns, Kulik, Kulik, & Morgan (1991). Mindfulness, or what might more accurately be referred to as metacognitive engagement, is necessary to enhance writers' use of feedback (Gielen, Peeters, et al., 2010; Gielen, Tops, et al., 2010).

Deployment of the prior question strategy, which potentially enhances writers' engagement with the peer feedback process and provides them an opportunity to share their needs, has potential to be a powerful intervention. The peer feedback process is typically a simple one-way communication process (from reviewers to writers) (Patchan et al., 2013). However, this strategy can provide two-way communication (1) from a

writer to a reviewer, and (2) from a reviewer to a writer). Nicol and Macfarlane-Dick (2006) claimed that two-way communication (i.e., dialogue) is one of the keys to enhancing self-regulated learning. The function of the prior question strategy is thus to "attune feedback to the assessee's needs" (Gielen, Tops, et al., 2010, p. 149). This strategy helps reviewers generate more writer-centered feedback—feedback providing information that reflects writers' needs (Voet et al., 2018). Let's now consider some of the higher quality research which used this strategy.

Gielen, Tops, et al. (2010) examined differences in the effect of peer feedback among four groups: control (general corrective feedback by an instructor in class), peer feedback only, peer feedback + prior question form, and peer feedback + feedback reply form. The seventh-grade students in the two groups that posed prior questions improved their performance and outperformed the control and the peer feedback only groups. Moreover, a higher proportion of students indicated the received feedback was useful in the prior feedback group (57%) than in the other two peer feedback groups (37%, 38%).

Gielen and De Wever (2015) evaluated the use of a prior question form for writers and a content criteria checklist for reviewers. The study compared four groups of undergraduate participants: control, prior question, content criteria checklist, and combination of prior question and content criteria checklist. The reviewers in the prior question and combination groups significantly improved their feedback quality from the first to the second round, even though their feedback deteriorated in quality from the second to the third round. In terms of the writers' performance, the prior question and combination groups improved from the first to the second round, however, the performance of the prior question group improved only slightly from the second and the third round and that of the combination group decreased from the second to the third round. The authors explained that iterative, reciprocal peer reviewing improves writers who also act as reviewers because they generate internal feedback through the reviewing role, which diminishes their need to receive external feedback in the writing role. According to their analysis of students' self-reports, students believed the prior question tool helped to generate useful feedback that was specific and actionable.

In similar research, Voet et al. (2018) compared a prior question group and three other groups (control, content criteria checklist, and combination) and examined the effect of each condition on peer reviewers' feedback and on writers' agreement with the

received feedback. The frequency of reviewers' verification feedback, which confirmed whether writers met the criteria, decreased in the prior question and combination groups, whereas it increased in the control and content checklist groups. The proportion of feedback that provided elaborated information on top of the verification feedback increased in the prior question and the combination group when the length of the feedback was taken into account. However, the authors noted that writers' agreement with the feedback requested via the prior question tool was not significantly different from writers who did not have access to the tool in their study. Voet et al. (2018) explained that this could be due to the writers' attitudes toward the reviewers' status. According to them, writers tend to consider peers less credible in providing feedback than experts.

Although the use of prior questions as an instructional intervention has generated considerable theoretical interest, studies evaluating it are still rare and, as we have seen, have produced mixed results. Therefore, further investigation is necessary to explore and understand the usefulness of prior questions for writers and reviewers. In the current study, I integrated a *Prior Question Tool* adopted from the prior question intervention strategy described above.

3.5.2. Helpful Feedback Survey and Sharing (HFSS)

In peer feedback research, the competence of peer reviewers sometimes has been questioned. For instance, Cho and Schunn (2007) stated that reviewers are generally not competent in constructing feedback because their subject knowledge is limited and they do not have much experience in constructing feedback. These problems lead to the construction of inaccurate and less helpful feedback. Moreover, Nelson and Murphy (1993) asserted that writers (particularly ESL writers) often perceive that peer reviewers are not competent. It is, therefore, crucial to provide instructional intervention that helps peer reviewers to construct useful feedback.

In the current study, the *Helpful Feedback Survey and Sharing (HFSS) Tool* was employed to deal with the above-mentioned issues. The purpose of the tool is to assist peer reviewers to improve the quality of their feedback, ease the task of feedback construction, and understand what helpful feedback would be from the writer's perspective. Modeling is a powerful learning process by which students observe a model

image or action to learn new or cognitively challenging skills (Zimmerman & Kitsantas, 2002). Modeling may be especially helpful for the reviewers, who are novices in that role, because it helps them reduce extraneous cognitive load (Van Steendam, Rijlaarsdam, Lies, & Van den Bergh, 2010). Orsmond, Merry, and Reiling (2002) used exemplars and evaluation criteria in their peer assessment process to assist first-year biology students in creating high quality histology posters. The students were shown exemplar posters created by students in the previous course, and they discussed the exemplars in groups. The result was that the exemplars helped students produce higher quality work.

Nicol (2009) suggested instructors compile and give students a list of all possible instructor feedback comments. According to the author, the list of feedback comments allows students to browse what kind of feedback other peers may receive from the instructor and helps students to flag hidden pitfalls. Also, students' understanding of the assignment requirements could be enhanced by engaging with the list. Lin et al. (2001) reported that peer reviewers considered the reviewing process to be time-consuming. While Nicol (2009) proposed including all possible feedback comments on the list, the *HFSS Tool* collects helpful feedback comments by asking assesses to nominate the two most helpful ones from the peer feedback they received. This *Helpful Feedback List* contains a sufficient number of helpful feedback comments without being overwhelming for reviewers. The list is shared with all students in the course. The list could mitigate quality issues by efficiently assisting peer reviewers who struggle with constructing useful feedback.

3.6. Summary

Although many studies have been conducted on peer feedback as a learning activity and its general effectiveness is widely accepted, a debate about the relative effectiveness of participating in the roles of writer and reviewer continues. The most relevant points from the research reviewed here can be summarized as follows.

1. Less benefit for writers than reviewers has been observed in multiple studies.

2. Various factors limit the benefits writers receive from the peer feedback process. One of the key factors is writers' acceptance and use of feedback.

To promote writers' use of feedback, multiple factors have been identified. Two factors especially deserve greater attention from researchers — the quality of peer feedback and writers' characteristics.

Although much research has investigated how to provide helpful feedback (Poulos & Mahony, 2008), much uncertainty still exists about the complex relationship between writers' revision behavior and their beliefs about the helpfulness of received peer feedback (Lu & Law, 2012). Therefore, it is important to bridge the two important processes of giving feedback and responding to it (Cartney, 2010). Similarly, writers' characteristics such as their ability, prior peer feedback experience, and attitudes toward peer feedback influence their use of feedback, so it is desirable to consider these factors in peer feedback research.

Two peer feedback interventions, the *Prior Question Tool*, and the *Helpful Feedback Survey and Sharing (HFSS) Tool*, are tools designed to assist both writers and reviewers, but especially writers. The *Prior Question Tool* not only helps reviewers to know what kind of feedback writers are looking for but also provides writers the opportunity to convey what they want. The *HFSS Tool* supports writers in receiving more helpful feedback in addition to assisting reviewers in efficiently generating more helpful feedback. These tools were incorporated in the current study.

The current study was therefore guided by the following research questions (repeated from Chapter 1):

> Q1. What types of feedback comments were seen as helpful by writers, and what types did they use?
>
> Q2. What types of feedback comments do reviewers make, and how do they change as the peer feedback process iterates?
>
> Q3. What were students' attitudes toward the peer feedback experience with interventional strategies?
>
> Q4. How closely did students adhere to the instructions they were given for the peer feedback process?

Chapter 4.

Research Settings and Interventions

This chapter presents a detailed account of the research setting, the peer feedback design, and the peer feedback process used in the current study.

4.1. Course and Students

The research was conducted in a 13-week, upper-division undergraduate course on instructional psychology during the spring semester of 2017 at Simon Fraser University (SFU). The course dealt with theories, research, and applications of educational psychology in teaching and learning. The course description states that the course:

> Examines theories of instruction and research about learning, motivation, individual differences, and social environments as foundations for designing instruction. Topics include: models of cognition; models of motivation and beliefs; metacognition, self-regulated learning, and learning skills; problem solving and transfer; cognitive processing models of instruction in mathematics, science, social studies, reading and composition.(Simon Fraser University, n.d., "Instructional Psychology")

Students were required to take an introductory level of educational psychology course as a prerequisite. This course where the research was conducted provided credit toward a bachelor's degree in education.

The class met once per week for 170 minutes in a classroom at the SFU Surrey campus. The instructor made significant use of Canvas®, a web-based Learning Management System (LMS), to distribute materials, submit assignments, and track students' progress. No textbook was used. Instead, a list of reading materials was provided by the instructor. Students accessed the assigned readings via the LMS or the university library.

4.2. Analysis of Course (Teaching Practice) Assignments

Students who enrolled in the course were required to complete three assignment essays as a part of the evaluation for their final grade. The final grade was awarded based on the three written assignments (Assignment 1: 15%, Assignment 2: 20%, Assignment 3: 25%), a presentation (20%), and participation (20%). The assignments were given to promote inquiry and reflection about teaching practices that students learned about through the course.

While the instructor was designing the assignments, I approached her and proposed incorporating the peer feedback strategy. Although instructors of the course have been aware of peer feedback as an approach which potentially promotes students learning, it had not previously been incorporated in the course. The instructor and I worked together to re-design the primary writing assignment with the goal of enhancing students' knowledge of course concepts and their application. As I have discussed, peer feedback allows students to receive individualized feedback promptly without unduly increasing instructors' workload. Two intervention tools, the *Prior Question Tool*, and the *Helpful Feedback Survey and Sharing (HFSS) Tool*, were added to enhance students' peer feedback experience. A peer feedback procedure deploying both intervention tools was adopted for all three assignments.

The combined deployment of the intervention tools was unique to the assignment designed for the course. In each assignment, students wrote a reflective and analytical essay after watching video clips about classroom teaching chosen from a list provided by the instructor. The length of each video ranged from 15 to 50 minutes. In the videos, students observed actual classroom learning activities guided by a teacher. The level of the classes (elementary and secondary school) and subject (e.g., animal adaptation, butterfly life cycle, mechanism of sound) in each video varied. Various learning activities were presented in the videos including problem-solving, whole-class discussion, role-playing, and experiment. Teachers demonstrated various teaching techniques (e.g., highlighting/underlining, practice testing, epistemic climate). For each essay, students were instructed to identify specific teaching practices presented in the videos, and then describe and analyze them using the theories covered during the course. The theories include cognitive, motivational, and constructivist theories as they related to teaching and learning. In addition, students were required to propose how they would teach

differently than the teachers in the videos. In the proposal section, they were also asked to connect the proposed actions to the theories covered in the course. The evaluative criteria and rubric shown in Figure 4.1 and Figure 4.2 were provided to students. The criteria included a description of the video content, quality of analysis and proposal, sentence structure and expression, and writing format (APA style). The points allocated for criteria in the rubrics differed across assignments to reflect the grading weight for the final grade.

The assignment instructions, rubric, and process were provided via the LMS as shown in Figure 4.3, Figure 4.2, and Figure 4.3. The assignment information included the purpose of the assignment, number of minimum and maximum pages, the list of teaching videos, required contexts of the essay, structure of the essay, grading and submission details, evaluation criteria, important dates, and a description of the peer feedback procedure. The three assignments had the same instructions except the word length differed across assignments (Assignment 1: 1000-1200 words, Assignment 2: 1200-1500 words, Assignment 3: 1300-1600 words), the grade point values (Assignment 1: 15 points, Assignment 2: 20 points, Assignment 3: 25 points), and important dates.

Assignment 1:

This paper should be between 1000 & 1200 words, not including the reference section. Follow all APA conventions in writing style except for the structure. Make sure you cite the sources of **ALL** the ideas and quotations that you have used in-text.

The purpose of this assignment is to promote inquiry and reflection about teaching practice.

1. Access URLs to Youtube classrooms videos posted on canvas.Videos .docx
2. Observe how the instructor manipulated the environment to enhance students' learning. While observing, assess the effectiveness of instructor's attempts to promote proper cognitive processes that induce learning.
3. Choose/ focus on three specific things the instructor did
4. For each point provide the following:

- **Description:** (a) the content/ focus being taught, and (c) how does the instructor present the material?
- **Analysis and connection to theory:** (a) is the instructor's attempt effective/ineffective? (b) Why is it effective/ ineffective (tie it to theory covered on Jan 13, 20, 27 and Feb 3: introduce the theory and explain how it is applied in this context)

5. Propose one thing that you would do differently: (a) what is it? (b) Why (tie it to theory covered on Jan 13, 20, 27 and Feb 3: introduce the theory and explain how it could be applied in this context)

Structure:

Name:

Video URL: [in case you use more than one URL, list them in order of usage, e.g. URL 1 (used in point of focus 1 ...etc)]

Age group:

1. *(Title of point of focus)*

- Description:
- Analysis:

2. *(Title of point of focus)*

- Description:
- Analysis:

3. *(Title of point of focus)*

- Description:
- Analysis:

4. *Proposal:*

- What is it?
- Why?

Figure 4.1 Assignment Instructions and Structure – Assignment 1

Submission and Grading Details

Assignment 1 is worth 15 points (15% of your grade for the course). You should submit the paper via the Canvas assignment dropbox. Late submissions will be penalized 2 points per day (or partial day) late and will not be accepted more than 72 hours after the deadline.

Rubric:

Component	Pts.	Breakdown of Pts.	
Writing Mechanics	3	1: APA	2:Sentence structure and expression
Focus 1	3	1: Description	2: Analysis
Focus 2	3	1: Description	2: Analysis
Focus 3	3	1: Description	2: Analysis
Proposal	3	1: What?	2: Why

Important dates

6th Feb: Submit paper draft to peer reviewer (4:00 p.m)

8th Feb: Submit reviewed paper with comments to receiver of feedback (4:00 p.m)

Figure 4.2 Assignment Submission and Grading – Assignment 1

Peer review details

1. **Download this file** Assignment paper template_012617-1.docx
2. **Write your draft.** Make sure you provide comments (general & specific) to the reviewer as detailed in the file.
3. **Submit your draft for peer review**

- Open the Assignment page and click the assignment title (Submit, give and receive peer feedback)
- Click on "Submit Assignment" on the upper right corner
- Click on "Chose File" and select your draft to submit
- Click on "Submit Assignment"
- Please see the link below for more details.

https://guides.instructure.com/m/4212/l/54353-how-do-i-upload-a-file-as-an-assignment-submission-in-canvas

4. Download assigned peer's paper and upload reviewed paper

Once you were assigned peer's paper for review, you will see a notification on the Dashboard.

Please see the link below for more details.

https://guides.instructure.com/m/4212/l/103951?data-resolve-url=true&data-manual-id=4212

When you receive the notification,

- Go to "Assignments", click "Submit, give and receive peer feedback" assignment
- You will see your assigned peer review partner's name under the Assigned Peer Reviews section on the submission box
- Click the name of the assigned peer whose work you will be reviewing
- Click the name of your peer's file to download
- Open your peer review partner's paper and provide feedback on his/her paper on MS-Word
- Go back to the assignment page to upload the reviewed paper
- Click the "Attach File" under the comment box on the right side of the screen
- Select the reviewed paper and click on "Save"

5. Download the reviewed paper

Once your peer reviewer uploaded the reviewed paper, you can download it from the assignment page.

- Go to Assignments, click "Submit, give and receive peer feedback"
- You will see a file name which your peer reviewer uploaded under the Assigned Peer Reviews section on the submission box
- Click the file name to download

6. Use peer's feedback to revise and edit your paper, then submit your final paper.

7. Submission of final paper:

- Go to Assignments, click "Assignment 1"
- Click on "Submit Assignment" on the upper right corner
- Click on "Chose File" and select your draft to submit
- Click on "Submit Assignment"
- Please see the link below for more details.

https://guides.instructure.com/m/4212/l/54353-how-do-i-upload-a-file-as-an-assignment-submission-in-canvas

Figure 4.3 Assignment Peer Review Process – Assignment 1

Students submitted the first, second, and third assignments in the 6th week, 10th week, and 13th week of the course, respectively. The themes and the evaluation criteria were consistent across the assignments, so the reviewers could refer to and adapt the selected helpful feedback comments from the writers as models for their feedback comments.

4.3. Peer Feedback Design and Process

To enhance the peer feedback experience from the perspective of the assignment writers, two instructional intervention tools and several peer feedback features were employed in the current study. Various intervention strategies and peer feedback features have been used in peer feedback. However, most intervention strategies have been designed to support reviewers (Gielen & De Wever, 2015). Therefore, two tools designed to enhance the writers' peer feedback experience were incorporated in the current research as interventions. These were used in conjunction with three peer feedback features specific to this intervention: training, single-peer feedback, and non-anonymous feedback.

My research investigated potential enhancements of writers' peer feedback experience by designing, deploying, and evaluating two intervention tools—a *Prior Question Tool* and a *Helpful Feedback Survey and Sharing (HFSS) Tool*.

4.3.1. Prior Question Tool

In the current study, the *Prior Question Tool*, which is a template or form, was used by both writers and reviewers. The tool was adapted from Gielen, Tops et al. (2010) and modified for the current study. Tools similar to this have been employed in several studies to address writers' use of feedback by increasing the relevance of feedback to the writer's needs (e.g., Gielen & De Wever, 2015; Gielen, Peeters et al., 2010; Voet et al., 2018).

The tool was designed to assist writers in obtaining specific, preferred feedback from peer reviewers. It consisted of three sections: (1) an overall comment section, (2) a specific comment section, and (3) a first draft section. The overall and specific sections were provided to extend over the full scope of writing issues, which include global and

local levels. The global issues related to holistic features such as organization, completeness, and cohesion, while the local issues related to sections of the draft and intra-sentential features such as spelling, grammar, and word choice (Nelson & Schunn, 2009).

The overall comment section (see Figure 4.4) was created and presented on the first page of the tool. In this section, writers entered their overall concerns with their draft, and their requests/questions to reviewers about the whole paper. The overall section was designed to share broader issues which related to the whole or an extensive area of the paper (e.g., “Are my descriptions of what the teacher is doing detailed enough for someone who has not seen the video to understand?”; “I was unclear of some theories so I would like to know if I used good theories and correctly applied them to the examples from the video.”). In the specific comment section (see Figure 4.5), writers entered their questions and concerns about their own written text, its content, ideas, formatting by using the comment tool in Microsoft Word. This section was geared toward accommodating sectional issues which address a specific area of the paper (e.g., “Is this enough description? does it make sense without watching the video?”; “Do you think this is an accurate analysis?”; “I struggled with introducing my proposal in a way that the context was clear without using a lot of my word count. Suggestions please?”) as well as local issues (e.g., “Should I just say object? Or do you have other suggestions to label the red cup/aluminum foil thing?”; “Should I add the teachers response after this?”; “Does my example demonstrate hypercorrection effects?? Should I be adding more to it?”).

The writers composed or inserted the text of their first draft immediately following the tool instruction paragraphs on the first page. Detailed instructions for how to use the tool were provided in the LMS. This process allowed the writers to express what kind of feedback they needed from the peer reviewers. After the writers completed all three sections, they uploaded the file to the LMS for peer feedback. The instructions to the peer reviewers were also provided in the same tool. The reviewers were instructed to use both the overall comment and specific comment sections to respond to the writers’ requests or concerns and enter their feedback directly into the electronic file.

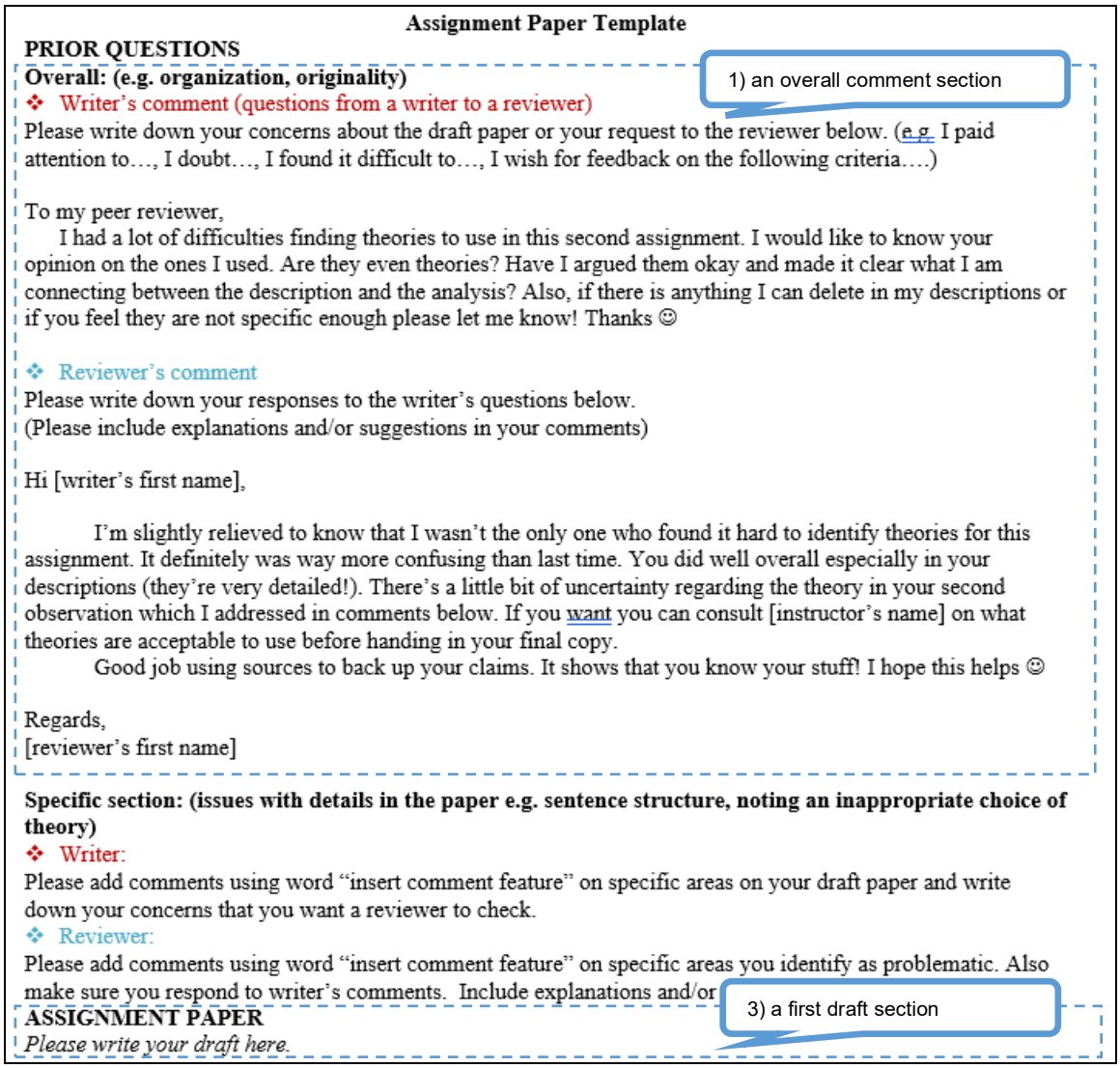


Figure 4.4 An Example of How Prior Question Tool was Used – Overall Section

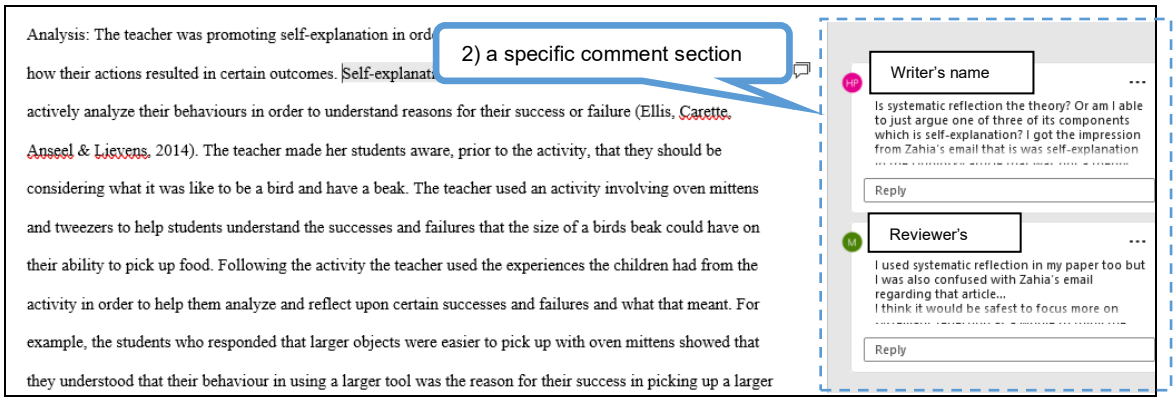


Figure 4.5 An Example of How Prior Question Tool was Used – Specific Section

4.3.2. Helpful Feedback Survey and Sharing (HFSS)

The *HFSS Tool* consists of a *Helpful Feedback Survey* and a *Helpful Feedback List*. The *Helpful Feedback Survey* was developed to obtain writer assessments of the helpfulness of the received feedback. The survey consisted of two sections (see Figure 4.6). In the first section, writers indicated the helpfulness of the received feedback. In the second section, they nominated up to two of the most helpful feedback comments they received. After completing each assignment (Assignment 1 and 2), writers completed the survey questions via the LMS in class. The writers were instructed to copy the helpful feedback comments directly from the *Prior Question Tool* and paste them onto the survey form.

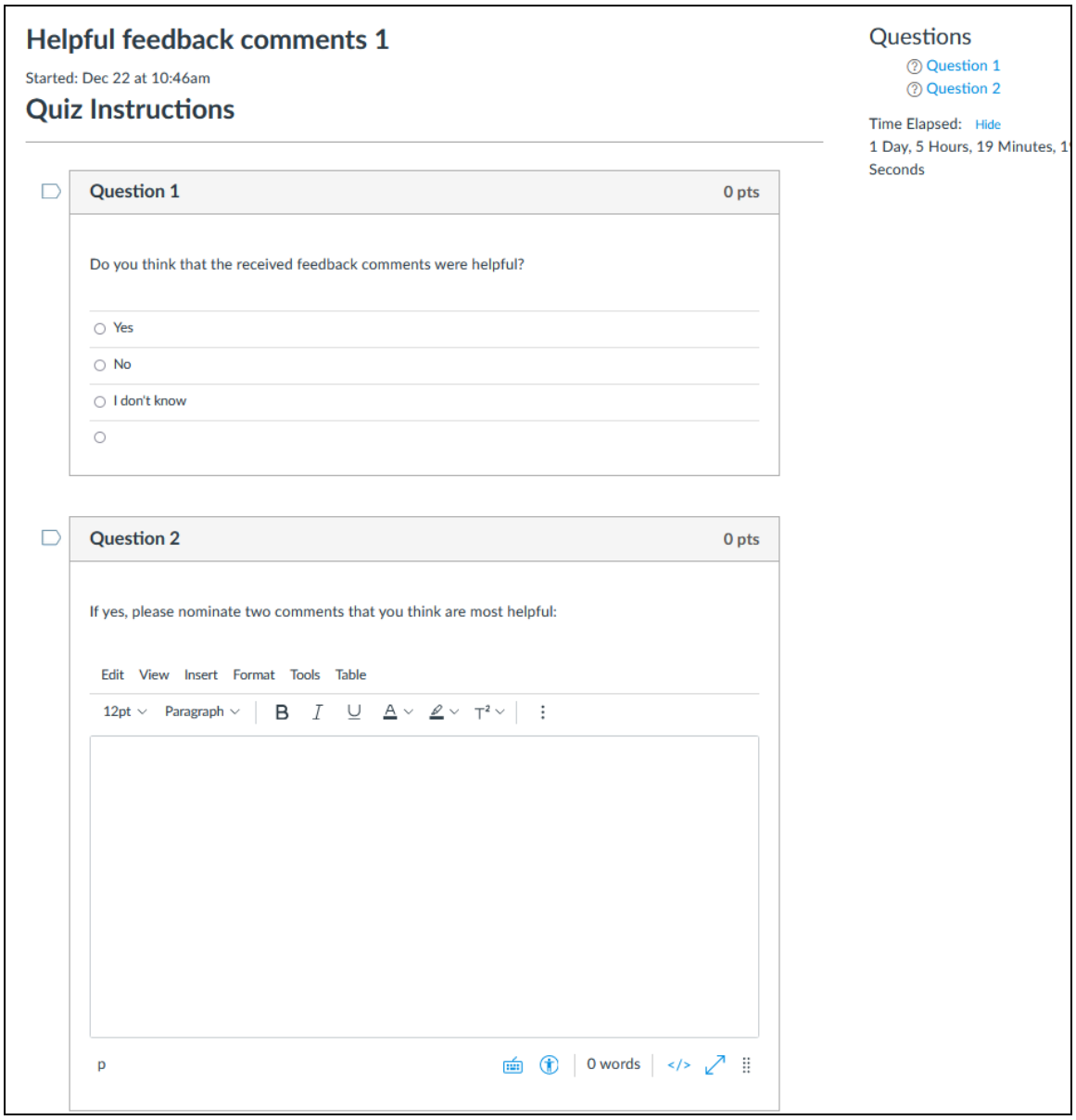


Figure 4.6 Helpful Feedback Survey

The nominated comments were compiled in one document called the helpful feedback list (see Figure 4.7). This list was posted via the LMS to share with all students as a resource for the next peer feedback cycle. The list was intended to provide model feedback for reviewers.

Helpful Comments – Assignment 1

- "This paper was a delight to read because your ideas were presented well and your connection of theory to practice was evident throughout, which reveals that you have a good understanding of the theories that we have been studying in class."
- "Perhaps a little more elaboration on how the lesson is divided (what are the 6 parts?) and how they teach would be helpful to give reader more context."
- "The theories you chose were well incorporated into your observations and justifications."
- "Put the specific times of the videos that you are highlighting in your writing."
- "At 11:03, the teacher gives her students the opportunity interaction with one another, in which then discuss."
- "Why is it bad that the students want to do a different experiment? "

Figure 4.7 An Example of the Helpful Feedback List

4.3.3. Training

Prior to the first assignment on the topic of teaching practice, peer feedback training was provided by the instructor during the fourth and fifth weeks of the course. Peer feedback researchers have often acknowledged the importance of training (Van Steendam et al., 2010). Sluijsmans, Brand-Gruwel, and Van Merriënboer (2002) found that students in a teacher training college in the Netherlands who received peer assessment training to provide constructive feedback significantly outperformed students who did not receive training. Those who received training constructed more helpful feedback. Moreover, a meta-analysis by Zheng, Zhang, and Cui (2020) revealed the effect size favoring peer feedback was significantly larger when peer reviewers received training. Training helps reviewers give ratings more similar to experts and construct more effective feedback (Liu & Li, 2014).

Approximately two hours of class time total were spent providing training over the course of two sessions. The training materials were adapted from *Student Peer Review: An Introductory Tutorial* (University of Melbourne, n.d.) and *Peer Review: Looking at Texts from a Reader's Perspective* (Purdue OWL staff, n.d.). The training dealt with

basic peer feedback theory, benefits, procedures, and helpful and unhelpful feedback examples. The main topics of the training material are listed below.

- What is student peer feedback?
- How does it work?
- What are the benefits?
- Writing feedback
- Helpful vs. unhelpful feedback
- Examples
- Receiving feedback

4.3.4. Single Peer Feedback

The peer feedback process used in this study was designed to provide feedback from a single peer reviewer only. While multiple reviewer peer feedback has been reported in some studies, not all class situations allow assigning multiple reviewers because reading peers' work and providing feedback can be a time-consuming task and a burden to reviewers. In research on undergraduate students' attitudes toward online peer assessment, 43% saw peer assessment as time and effort consuming (Lin et al., 2001). In the study by Gielen, Tops, et al. (2010), seventh-grade students indicated that the peer feedback activity was neither helpful nor effective and 63% preferred not to do it again. Moreover, peer feedback from multiple reviewers does not necessarily promote revision behavior. Writers often do not address feedback, especially when they receive too much of it. A meta-analysis of 24 peer feedback studies in higher education by Huisman et al., (2019) found multiple reviewer peer feedback is a possible factor in students' improvement of their writing, but the difference was not statistically significant, and the number of studies included in the analysis was limited.

4.3.5. Non-anonymous Feedback

I initially planned an anonymous process for my peer feedback research. Anonymous peer feedback seems to be most common in other studies (Zheng et al., 2020). However, my research adopted identifiable (i.e., non-anonymous) peer feedback due to technical limitations. An identifiable peer feedback process is one in which

reviewers know whose writing they are reviewing, and writers know who provided their feedback. Anonymous peer reviews have shown advantages in prior research. In their literature review, Panadero and Alqassab (2019) concluded that the use of anonymity in peer assessment positively affected students' performance, feedback content, and perceptions of peer assessment. However, they also noted mixed results in the research concerning performance and perceptions. Researchers have reported various benefits of anonymous feedback. For instance, Lu and Bol (2007) found undergraduate students participating in an anonymous process constructed more critical feedback than those participating in an identifiable process. In addition, the anonymous process led to more positive perceptions about the quality of feedback they gave and received. Students reported that the anonymous process allowed them to be honest and critical in both the reviewer and receiver roles. Students who were identifiable reported being unwilling to provide critical comments because they feared making their peer uncomfortable.

4.3.6. The Peer Feedback Process

Assignments in the current study followed the steps indicated in Figure 4.8. Detailed descriptions of steps 4 and 5, the most complex steps, are presented below. All three assignments followed the same steps except for two major differences. First, *the Helpful Feedback Survey*, in which writers indicated the helpfulness of received feedback and selected the two most helpful feedback comments, was completed only after the first and the second assignments. Second, the helpful feedback list which is the output from the *Helpful Feedback Survey* was used by reviewers only during the second and the third assignments.

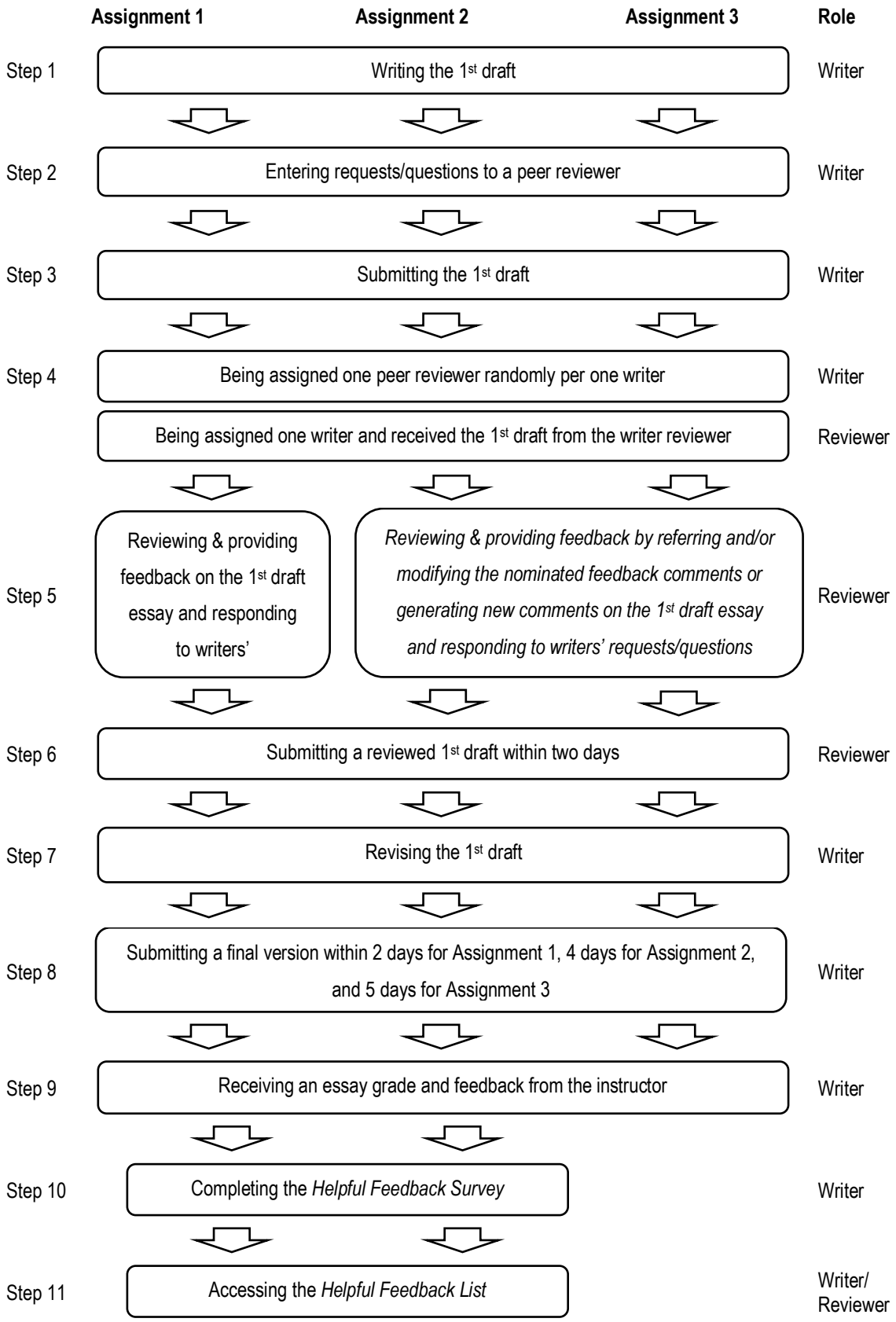


Figure 4.8 Peer Feedback Process

Step 4: Being assigned a peer reviewer/a writer [Writer/Reviewer]

Writers received the name of the assigned peer reviewer from the LMS. Reviewers also received a notification which included their assigned writers' name and the first draft file from the assigned writers. The peer review tool, which was embedded in the LMS, randomly assigned only one peer reviewer for each writer because it was judged, through consultation with the instructor, that having to review more than one peer's draft would impose an undue burden on students. While exchanging drafts between paired students is the more common dyadic peer feedback process, in this study a writer did not review the draft of their reviewer due to limitations in the peer review tool provided by the LSM. A new reviewer was assigned to each writer for each assignment.

Step 5: Reviewing a peer's first draft and providing feedback [Reviewer]

Peer reviewers received a notification from the LMS that they were assigned a writer's draft to review through a peer reviewer matching tool. Peer reviewers read the first draft and the writers' questions and requests, and then reviewed the draft by referring to the criteria provided by the instructor at the beginning of the peer feedback process. The reviewers entered feedback comments in the same first draft files created by the writers. In the overall comment section below the writers' comments, reviewers entered their feedback about the paper as a whole. The reviewers also inserted their feedback comments and their response to the writers' specific questions in the side margin. As an incentive, a peer feedback completion mark was given to reviewers who provided feedback (worth two points toward their final course grade for a total of six possible points earned for completing three reviews).

Peer reviewers had two options for the second and the third assignments: 1) copy directly or modify feedback comments from the *Helpful Feedback List* which contains helpful comments selected by the writers, and/or 2) generate new comments. They were encouraged to use both options rather than repeatedly choosing the same option.

4.3.7. Instructor's Involvement in the Assignment Process

Student learning can be affected by myriad factors (Centra & Potter, 1980). Centra and Potter (1980) asserted that teachers' characteristics and behavior constitute a powerful influence on student learning outcomes. Therefore, it is important to describe the instructor's involvement in the three written assignments.

When each assignment was first presented to students, the instructor explained the assignment information and posted it in the LMS to ensure students understood the procedures and purpose of the assignments. The instructor taught the peer feedback training session during the class immediately before the first peer feedback cycle. She also offered students various opportunities to approach her when they needed guidance and had questions/concerns about the assignment and related course topics. Students could ask questions and seek guidance via the LMS, email, and in-person communication before or after the class and during office hours. The instructor provided feedback on the side margin of students' final essays. She identified problems (e.g., accuracy, clarity, specificity, argument, comprehension of subject matters) and provided clues, suggestions, and explanations or posed questions, so students could reflect on the next assignment and improve their work. The instructor focused more on content problems than organization, format, and writing mechanics.

The instructor also scored the final versions of each assignment using the rubric provided in the assignment instruction and awarded marks toward the final grade. She posted announcements on the LMS to remind students of key aspects of reviewing peers' work, the peer feedback matching list, and the submission deadline. She also allocated time during class hours for students to complete the *Helpful Feedback Survey* to ensure the students could take advantage of the intervention tool.

Chapter 5.

Research Designs and Methods

In this chapter, I present the methods used to address the research questions. To understand the peer feedback process, particularly from the writers' perspective, I observed the types of comments generated by reviewers and investigated which ones were judged helpful by writers. The research interventions, which were designed to assist the writers in improving their essays as a demonstration of their acquired educational psychology knowledge, were a *Prior Question Tool* and a *Helpful Feedback Survey and Sharing (HFSS) Tool*.

The first research question concerned the types of peer feedback that writers sought to obtain, their use of received peer feedback, and the perceived helpfulness of the peer feedback they received. The second research question asked what types of comments peer reviewers generated, and what shifts took place in the types and amount of peer feedback over the three peer feedback activities. The third question aimed to understand writers' and reviewers' overall perceptions of the peer feedback experience. The fourth question concerned students' adherence to the implemented intervention tools, including the types of interaction between writers and reviewers during the peer feedback process through the Prior Question tool, and changes in the writers' use of the question tool over the three activities.

To depict the peer feedback experience and its effects on students, I used multiple research approaches. Comment analysis was used to classify comments generated by student writers and peer reviewers through the peer feedback process (Q1: What types of feedback comments were seen as helpful by writers, and what types did they use? and Q2: What types of feedback comments do reviewers make, and how do they change as the peer feedback process iterates?). Case study was used to examine in-depth the writers' use of peer feedback and to describe in detail the revisions they made to their writing (Q1: What types of feedback comments were seen as helpful by writers, and what types did they use?). To investigate the perceived helpfulness of the peer feedback experience, I analyzed the students' ratings collected via a questionnaire on the perceived helpfulness of the peer feedback experience (Q3: What

were students' attitudes toward the peer feedback experience with interventional strategies?). Finally, I investigated trends over time in students' use of the Prior Question tool and the types of writer-reviewer interaction that took place through it (Q4: How closely did students adhere to the instructions they were given for the peer feedback process?).

5.1. Participants

Participants were recruited and the research was conducted with the approval of the Simon Fraser University Research Ethics Board (REB) (see page iii). Of 33 students enrolled in the course, 31 volunteered to participate in the research. The *Participant Characteristics Questionnaire* (Appendix A) was distributed and collected by the course instructor during a class held near the end of the course to gather demographic information. Twenty-nine students completed the questionnaire.

Most participants (72%) reported their first language as English, and the rest reported Chinese (21%), Korean (3.5%), and Kurdish (3.5%). Six students declared their sex as male, while 23 declared as female. Participants' ages ranged from 18 to 30 years, with the most common range of reporting from 21 to 25 years (69%). Their self-reported cumulative grade point average (GPA) ranged from 2.0 to 3.99, with the most common range of reporting from 2.5 to 2.99 (33.3%). Two students reported they did not know their cumulative GPA. The participants were registered in various majors (e.g., Education, History, French, Psychology), but all had previously completed an introductory course in Educational Psychology.

According to their survey responses, most participants had been enrolled in their undergraduate program for two years or longer, and most had gained experience with peer assessment prior to the course: 77% had experienced peer assessment, 16% had never experienced it, and 7% did not answer this question. Among participants with prior experience of peer assessment, 8 students reported that they had experienced peer assessment only once, 10 of them reported having experienced it two times, 4 of them reported having experienced it three times, and 2 students reported having experienced it four times.

5.2. Instruments

Several instruments, including questionnaires relevant to participants' peer feedback experience, were distributed in class by the course instructor.

5.2.1. Participant Characteristics Questionnaire

Demographic data (e.g., age, gender, major, years in school) and other important information for the study (e.g., the number of prior peer assessment experiences) were gathered via the *Participant Characteristics Questionnaire* (see Appendix A). A summary of the results was presented in section 5.1.

5.2.2. Peer Feedback Experience Questionnaire

Students' perceptions of the peer feedback experience were assessed in a separate questionnaire. The purpose of the questionnaire was to understand how students viewed the peer feedback activities they experienced. The collected data was analyzed using descriptive statistics.

The *Peer Feedback Experience Questionnaire* (see Appendix B) was administered in a class scheduled near the end of the course. Data are available from 26 students who responded to the questionnaire. The questionnaire was created by adapting and modifying questionnaires from prior peer feedback research (Lin et al., 2001; Prins et al., 2006; Wen & Tsai, 2006) and some original items were added by the investigator. Forty-two items in the questionnaire were divided into five sub-categories: General, Online Implementation, Tool, Received Feedback, and Other. All items on the questionnaire used a five-point Likert-type scale. Due to an error in presenting the response scale, participants' answers ranged from 1 (*strongly disagree*) to 4 (*strongly agree*), or 5 (*don't know*). The implications of this error for analysis will be examined next.

There has been debate about whether midpoints should be included or not in Likert-type scales (e.g., Garland, 1991; Joshi, Kale, Chandel, & Pal, 2015). For the analysis, I decided to adjust the response scales to increase statistical efficiency, since the four-point Likert-type scale places limitations on the ability to carry out some

statistical analyses, such as Cronbach's alpha and Pearson's correlation (Chyung, Roberts, Swanson, & Hankinson, 2017). Moreover, some words such as "I don't know" or "It depends" may not be appropriate to represent as a neutral level of agreement on the scale (Chyung et al., 2017). However, it is still possible to assume that the scale response, *don't know*, could be chosen by students as an intermediate level of agreement, even though the scale was numbered as 5 in the original questionnaire.

To determine the best way to numerically represent the questionnaire responses I compared two alternate scales. The first was a five-point scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *don't know*, 4 = *agree*, 5 = *strongly agree*. In this scale, the fifth choice of the original scale, *don't know,* was moved to the middle point of the scale to treat the choice as a neutral or intermediate response. The second was a four-point scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, 4 = *strongly agree*.

The computed Cronbach's alpha and the number of *don't know* responses are presented in Table 5.1. In computing reliability of the four-point scale, the responses to the fifth item on the scale, *don't know*, were eliminated. The results showed Cronbach's alpha—a measure of the questionnaire's reliability—decreased when the *don't know* data points were eliminated. Thus, the five-point scale, together with its larger *N*, was adopted for further analyses in the current study.

Table 5.1 Table Comparing Reliability of the Five-Point and Four-Point Scale

Scale 1 5-point scale	Number of 5 (*don't know*) in Scale 1	Scale 2 4-point scale
$\alpha = 0.912$	92	$\alpha = 0.892$

Next, the corrected item-total correlations were checked. The correlations of this instrument varied between 0.77 and 0.02. The items for which the item-total correlation is below 0.3 can be considered as possibly decreasing internal reliability (Nurosis, 1994 as cited in Cristobal, Flavian, & Guinaliu, 2007). Three items (Q10, Q13, and Q38) had item-total correlations below 0.3, but all were kept in the instrument because none was found to elevate alpha when deleted.

It is necessary to apply reverse scoring to items with opposite-side semantics. The wording of most of the items clearly reflected a positive attitude toward peer

assessment or its components, for example: “Q5. The peer feedback activities motivate me to learn.” Four items (Q9, Q13, Q32, Q38, Q41) were deemed to have more ambiguous valences, but, as they all had positive item-total correlations, none were considered candidates for reverse scoring.

Ideally, one would prefer to use the tools of exploratory and confirmatory factor analysis as part of a more systematic instrument development process. This was not possible due to the sample size (N = 26). To subcategorize the items, I first read them carefully and identified several themes. Second, each item was categorized according to its theme. The internal consistency of each tentative subcategory was computed. The subcategories which indicated an unacceptable level of the internal consistency were either eliminated or amended by removing items. For instance, a subcategory, Provided Feedback, was initially created which included items 9, 35, 36, 40, and 41. The reliability test indicated an unacceptable level (α = 0.64). Thus, this subcategory was eliminated, and its items added to an Other subcategory which consisted of unrelated items not assessing a common theme.

In other cases, where the subcategory alpha was between 0.70 and 0.80, an item analysis was performed to see whether removing an item from a subcategory could substantively improve its reliability. The initial Received Feedback subcategory consisted of nine items (Q27, 28, 32, 33, 34, 37, 38, 39, and 42) and the alpha level was 0.71. Cronbach’s alpha was iteratively re-computed after dropping items with low corrected item-subcategory correlations. The alpha level indicated 0.83 after dropping three items (Q32, Q33 and Q38). Thus, those items were transferred to a General subcategory which consisted of items asking about overall peer feedback experience.

Through this process, the questionnaire was categorized into five subcategories: General, Online Implementation, Tool, Received Feedback, and Other. Tables 5.2, Table 5.3, and Table 5.4 show the subcategories, with associated items and the computed value of Cronbach’s alpha for each category of related items. Cronbach’s alpha for the Other subcategory was not computed because its items were not intended to measure a common underlying belief or attitude, and thus were not expected to correlate.

The General subcategory contains 9 items (α = 0.834) which ask about the helpfulness of the peer feedback activity as a whole. The Online Implementation subcategory includes 7 items (α = 0.801) which reflect students' satisfaction with the operational procedure implemented via the LMS throughout the peer feedback process. The Tool subcategory consists of 4 items (α = 0.795) pertaining to the intervention tools applied in the peer feedback process for the current study, including the advantage of the *Prior Question Tool* and the *HFSS Tool*. The Received Feedback subcategory is composed of 6 items addressing the writers' role (α = 0.828). In these items, writers' perceptions of the benefits of the received peer feedback were queried. The last subcategory, Other, has 16 items. Items which did not belong to any of the above-mentioned subcategories were included in this subcategory.

Table 5.2 Peer Feedback Experience Questionnaire – General

Item #	Question
General: α = 0.834	
1	The peer feedback is helpful to my learning.
2	The peer feedback makes me understand more about teacher's requirement.
3	The peer feedback activities can improve my skills in written communication.
4	The peer feedback activities help me understand what other classmates think.
5	The peer feedback activities motivate me to learn.
6	The peer feedback activities increase the interaction between my teacher and me.
7	The peer feedback helps me develop a sense of participation.
8	The peer feedback activities increase the interaction between my classmates and me.
11	I think the peer feedback is fair to assess students' performance.

Table 5.3 Peer Feedback Experience Questionnaire – Online Implementation, Tools, Received Feedback

Item #	Question
Online Implementation: α = 0.801	
16	Online peer review process can be timesaving.
17	Online peer review process can increase the positive interaction among classmates.
18	Online peer review process can be economical.
19	Online peer review system is a satisfactory system for uploading assignment.
20	Online peer review system is a satisfactory system for downloading assignment.
21	Online peer review system is a satisfactory system for giving feedback.
22	Online peer review system is a satisfactory system for receiving feedback.
Tools: α = 0.795	
23	The Assignment Paper Template helped to receive helpful feedback.
24	The Assignment Paper Template helped to provide helpful feedback.
26	The Helpful Feedback Comment List can be timesaving.
29	The Helpful Feedback Comment List is helpful to create feedback.
Received Feedback: α = 0.828	
27	The amount of the feedback I received from the peer reviewers is sufficient.
28	I understand easily the feedback I received from the peer reviewers.
34	Generally, the feedback that I received is fair.
37	I can learn from receiving feedback.
39	Generally, the feedback that I received is specific.
42	Generally, the feedback that I received is helpful.

Table 5.4 Peer Feedback Experience Questionnaire – Other

Item #	Question
Other	
9	I think students should not be responsible for giving feedback.
10	The teacher should develop criteria of the peer feedback activities for students.
12	Students should participate in the development of criteria for the peer feedback activities.
13	The peer feedback is time-consuming.
14	My feedback giving to classmates are affected by the feedback given to me.
15	If I receive feedback less helpful than I expected, then I will not try to provide helpful feedback to classmates.
25	I prefer to give feedback on specific paragraphs or sentences using the Tracking tool on MS-Word rather than giving summarized feedback at the end of the essay.
30	I received more helpful feedback in Assignment 2 than Assignment 1.
31	I received more helpful feedback in Assignment 3 than the Assignment 2.
32	Peers may not have adequate knowledge to provide feedback.
33	Peer feedback was often ambiguous or not relevant for further modification.
35	I can give understandable feedback.
36	Giving each other feedback is instructive.
38	For me, receiving feedback from peers is threatening.
40	I can learn from giving feedback.
41	Feedback should be given only by a teacher.

5.2.3. Questionnaires for Learning Attitudes and Competencies

In addition to the questionnaires already mentioned, students completed two questionnaires (a *Writing Self-Efficacy Questionnaire* and a *Learning Questionnaire*) which measured attitudes and competencies in learning and writing. These questionnaires were employed to distinguish writers' individual differences, since they could affect their peer feedback experience. Moreover, feedback could indirectly affect students' self-efficacy and attitudes through its effect on students' performance and perseverance (Agricola et al., 2020). According to Agricola et al. (2020), "[s]elf-efficacy and motivation are strongly connected" (p. 8). They argue that the higher self-efficacy students have, the greater possibility of possessing motivation to deal with challenging tasks. Thus, these questionnaires could be useful for understanding the divergence of writers' actions throughout the peer feedback process. All completed questionnaires were collected in class by the instructor.

5.2.3.1. Writing Self-Efficacy Questionnaire

As mentioned in Chapter 3, the level of writers' self-efficacy is one of the factors which could affect writers' use of feedback (Winstone et al., 2017). Previous studies have revealed a positive relationship between self-efficacy and academic achievement (Narciss, 2004). Narciss (2004) points out that self-efficacy "affects whether or not persons actually engage in task completion, how much effort they expend, and how much they persist in cases of errors or obstacles" (p. 216). According to Pajares (2003), previous studies reported that writing self-efficacy predicts performance outcomes and motivational characteristics such as writing self-concept and perceptions of writing value.

The *Writing Self-Efficacy Questionnaire* (see Appendix C) combined and adapted two existing writing self-efficacy instruments: the *Writing Self-Efficacy Scale (WSES)* and the *Self-Efficacy for Writing Scale (SEWS)*, previously published in the literature (see below). Each item was rated between 0 (*No chance*) to 100 (*Completely certain*). This questionnaire was used to gauge participants' confidence in writing. The questionnaire was distributed near the end of the semester.

The 24-item *WSES* was developed by Shell, Bruning, and Murphy (1989) to measure learners' confidence about writing tasks and writing skills. The items in the writing task subscale gauge students' self-efficacy for conveying meaning in various writing activities (e.g., writing a letter, a legal document, a novel, a class note). The items in the writing skill subscale measure students' self-efficacy for grammar, spelling, organization, and other writing skills. Shell et al. (1989) found the internal consistency reliability of each subscale was high (writing tasks α = 0.92, writing skills α = 0.95). I also borrowed from the 28-item version of the *WSES* (Pajares & Johnson, 1994). The adapted instrument in the current study had 20 writing task items and 8 writing skill items. The internal consistency reliability of the scores in my data was high (writing tasks α = 0.840, writing skills α = 0.954), and the inter-item correlations of the 28 items ranged between r = -0.165 and r = 0.572.

The 16-item *SEWS* developed by Bruning, Dempsey, Kauffman & Zumbrunn (2013) examines writing self-efficacy on the basis of three dimensions. The ideation subscale (5 items) assesses how writers view their ability to produce ideas. The convention subscale (5 items) assesses writers' belief in their knowledge of standard writing mechanics. The self-regulation subscale (6 items) assesses writers' confidence

regarding successful completion of writing tasks. Analyzing scores from middle school students, Bruning et al. found the subscales had high internal consistency (ideation α = 0.90, convention α = 0.85, self-regulation α = 0.88). They found the correlations among the subscales ranged from medium to large (ideation vs. self-regulation r = 0.72, convention vs. ideation r = 0.53, convention vs. self-regulation r = 0.46). Scores they obtained from high school students showed similar reliability (ideation α = 0.92, convention α = 0.86, self-regulation α = 0.87) and structure (ideation vs. self-regulation r = 0.71, convention vs. ideation r = 0.53, convention vs. self-regulation r = 0.44). The scores I collected from undergraduates also showed high internal consistency (ideation α = 0.878, convention α = 0.900, self-regulation α = 0.829). Although the correlations among subscales indicated clearer separation between them compared to Bruning and colleagues' data, there were still significant correlations ($p < 0.05$) between ideation and self-regulation (r = 0.458) and convention and ideation (r = 0.441). The correlation between self-efficacy for convention and self-efficacy for self-regulation was low (r = 0.293), and not statistically detectable in my small sample size.

5.2.3.2. Learning and Motivation Questionnaire

Motivation affects various aspects of learning. According to the generative activity principle, motivation is important for promoting and regulating generative processes such as those involved in writing (Fiorella & Mayer, 2021). Motivation also affects the writing process. Writers with low motivation spend less time engaging with writing processes than writers with high motivation (Hayes, 2012). Moreover, motivation is closely tied with students' achievement goal orientation (Agricola et al., 2020). Agricola et al. (2020) asserted that a variety of motivational processes depend on students' goal orientation.

The course instructor distributed the 56-item *Learning and Motivation Questionnaire* (see Appendix D) near the end of the semester to assess the participants' learning motivations and strategies. The questionnaire incorporated 47 items from the *Motivated Strategies for Learning Questionnaire (MSLQ)* (Pintrich, Smith, Garcia, & McKeachie., 1991) and 9 items from the *Achievement Goal Questionnaire (AGQ)* (Elliot & McGregor, 2001).

The *MSLQ* measures students' motivation and learning strategies and consists of two sections: motivation and learning strategies (Pintrich et al., 1991). The motivation section is composed of 6 subscales and the learning strategies section contains 9 subscales. Students responded to each item on a scale from 1 (*not at all true of me*) to 7 (*very true of me*). The *MSLQ* has been adopted by many researchers to predict and explain college students' academic achievement (Credé & Phillips, 2011). According to a meta-analysis by Credé and Phillips (2011), the correlation between each *MSLQ* subscale and college students' grades ranges from weak to moderate. In the study by Pintrich et al. (1991), internal consistency ranged from α = 0.52 to α = 0.93 across the subscales.

The *Learning and Motivation Questionnaire* used in this study adopted 8 subscales from the *MSLQ*: five from the motivation section (Intrinsic Goal Orientation, Extrinsic Goal Orientation, Task Value, Control of Learning Beliefs, and Self-Efficacy for Learning and three from the learning strategies section (Critical Thinking, Metacognitive Self-Regulation, and Effort Regulation). Table 5.5 shows reliabilities calculated from the responses in the current study.

Table 5.5 MSLQ Internal Consistency in the Current Study

Section	Subscale & Description	No. of items	Cronbach's alpha
Motivation		**26**	**0.876**
	Intrinsic goal orientation	*4*	*0.721*
	Intrinsic goal orientation subscale measures students' perception of a learning goal particularly about whether they prefer tasks required challenges and acquisition.		
	Extrinsic goal orientation	*4*	*0.519*
	Extrinsic goal orientation concerns students' perception of learning performance and outcomes.		
	Task value	*6*	*0.864*
	In Task value, students are asked how they perceived the given tasks such as importance and usefulness.		
	Control of learning beliefs	*4*	*0.576*
	Control of learning beliefs considers students' perception about the relationship between their efforts and their success in their learning.		
	Self-efficacy for learning & performance	*8*	*0.866*
	Self-efficacy for learning and performance refers to students' expectation of their successful task performance and their self-efficacy which is their belief in possessing ability and skill to achieve a given task.		
Learning strategies		**21**	**0.668**
	Critical thinking	*5*	*0.571*
	Critical thinking assesses what the extent of students' ability and skill to associate prior knowledge with new problem solving, decision making, or critical analysis is.		
	Metacognitive self-regulation	*12*	*0.454*
	Metacognitive self-regulation considers students' action in three learning activities: planning, monitoring, and regulating. Students are required to apply prior knowledge, be aware of their own action, and control their cognitive activities.		
	Effort regulation	*4*	*0.606*
	Effort regulation measures the degree of students' commitment to goal achievement.		
Total		**47**	**0.889**

Note. Descriptions of the subscales were cited from "A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)," by Pintrich, Smith, Garcia, and McKeachie, 1991.

The *Achievement Goal Questionnaire (AGQ)* was developed by Elliot and McGregor (2001) to measure students' achievement goals, which are their motivations in learning settings where there are opportunities to show achievement. My research used nine items from the revised version of the questionnaire, the *AGQ-R*, developed by Elliot and Murayama (2008). In the *AGQ-R*, students are located on a 2 x 2 achievement goal model (Mastery-approach goal, Mastery-avoidance goal, Performance-approach goal, and Performance-avoidance goal). The *AGQ-R* contains 12 items, but I excluded three

items which measure mastery-avoidance because researchers have criticized the construct's theoretical and empirical foundations (e.g., Baranik, Stanley, Bynum, & Lance, 2010; Ciani & Sheldon, 2010; Senko & Freund, 2015). Both the *AGQ* and *AGQ-R* have been widely used in various settings (Sánchez Rosas, 2015). In the study by Elliot and Murayama (2008), the reliability analysis showed a high internal consistency (Cronbach's α = 0.84 for mastery-approach goal, α = 0.88 for mastery-avoidance goal, α = 0.92 for performance-approach goal, and α = 0.94 for performance-avoidance goal). Table 5.6. presents the results of the internal consistency calculations using students' responses from the current study.

Table 5.6 AGQ Internal Consistency in the Current Study

Achievement type	No. of items	Cronbach's alpha
Mastery-approach goal	3	0.739
Students' goal in this type is to complete tasks. Students are motivated by intrinsic factors.		
Performance-approach goal	3	0.866
Students' goal in this type is to achieve high performance. Students are motivated by extrinsic factors.		
Performance-avoidance goal	3	0.899
Students' goal in this type is to avoid poor performance. Students are motivated by extrinsic factors.		
Total	9	0.837

Note. Description of type was cited from Hulleman, Schrager, Bodmann, and Harackiewicz (2010),

5.3. Data Collection

All data (see Figure 5.1) were collected during the semester that started in January 2017 and ended in April 2017. The *Participant Characteristics Questionnaire, Peer Feedback Experience Questionnaire,* and *Questionnaires for Learning Attitudes and Competencies* were distributed and collected on paper during class meetings near the end of the course, but on different dates. Students' scores on all writing assignments were also collected from the instructor after the completion of the course. The first draft and final version of students' written work, writers' request comments and reviewers' feedback comments on the *Prior Question Tool*, and writers' responses on the *Helpful Feedback Survey* from the *HFSS Tool* were collected within the LMS throughout the course. To maintain confidentiality, after data collection, each participant's name was substituted with a unique code number.

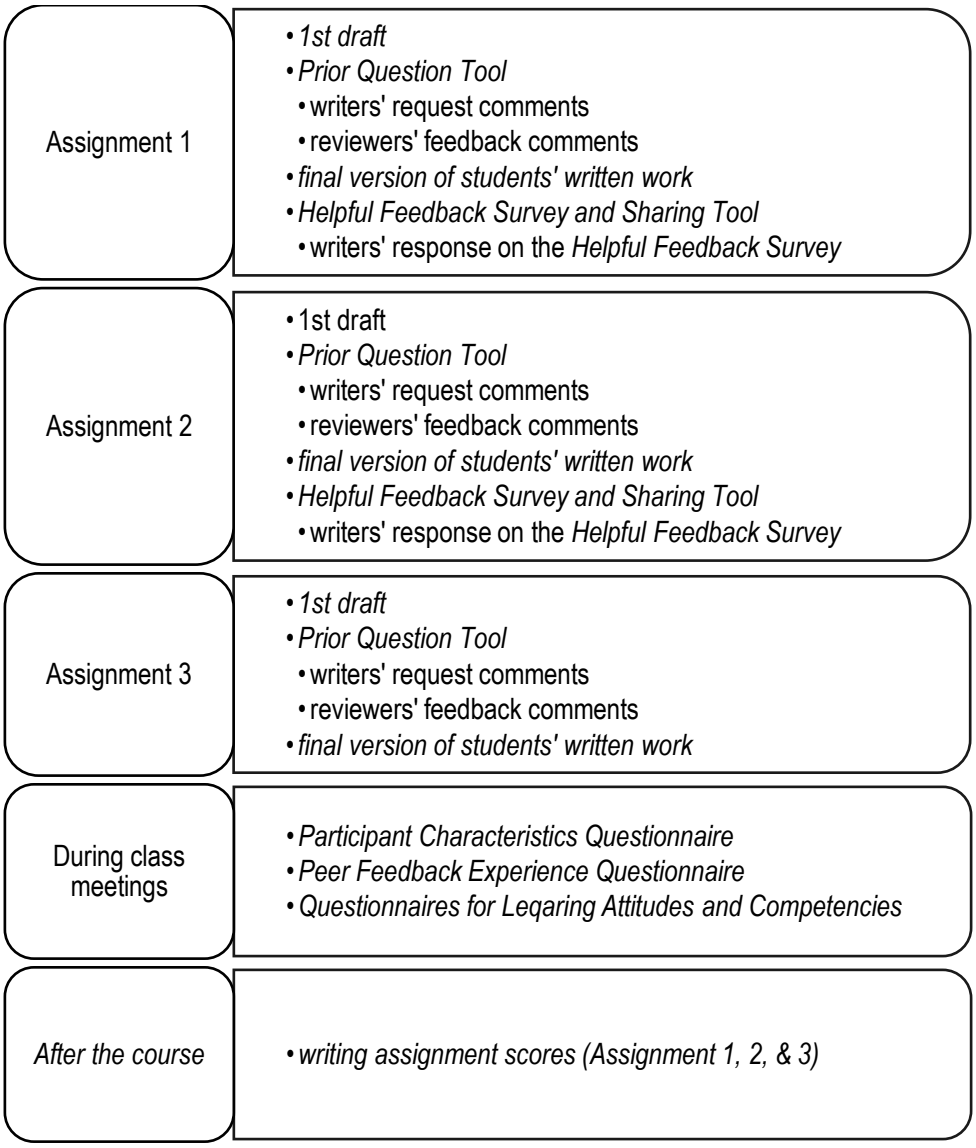


Figure 5.1 Collected Data

Twenty-one out of 31 students completed all three assignments and peer feedback procedures as a writer and a reviewer (30 students as writer and 21 students as reviewer). Table 5.7 indicates the number of students who participated as a writer or a reviewer on each assignment. One reviewer did not upload peer feedback in the first assignment. Six reviewers in the second assignment and five reviewers in the third assignment did not submit feedback. Only one writer did not submit the written work in the third assignment.

Table 5.7 Number of Students Who Completed Each Peer Feedback Task

	Assignment 1		Assignment 2		Assignment 3	
	Writers	Reviewers	Writers	Reviewers	Writers	Reviewers
1st draft	31		31		30	
Peer feedback		30		25		26
Final draft	31		31		31	

5.4. Data Analysis

The current study used multiple methods to analyze peer feedback for writers (see Table 5.8) to gain a holistic understanding of peer feedback experiences with two intervention tools. Both qualitative and quantitative approaches were employed, since a complementary approach between these two could lead to better results by scrutinizing data through each approach and reducing the impact of limitations and bias inherent to each approach (Choy, 2014).

Comment analysis was employed to gain a comprehensive grasp of writers' requested comments and reviewers' feedback comments. As a part of the comment analysis, the constant comparative method (Strauss & Corbin, 1990) was used to both inductively and deductively analyze those comments to address the first and second research questions. Recall that these questions concern writers' needs for peer feedback and the types of feedback comments offered by reviewers.

A case study approach was chosen to address the first research question regarding writers. Three case studies were undertaken to explore in greater detail the sequential process of revision for 3 writers in the peer feedback activity and provide a holistic illustration of feedback they found helpful as well as unusable.

Descriptive quantitative analyses were conducted to address the second, third, and fourth research questions.

Table 5.8 Research Questions, Methods, and Data for Data Analysis

Research Question	Method	Data
Q1: What types of feedback comments were seen as helpful by writers, and what types did they use?	Comment analysis Quantitative description Case study	• 1st draft • Writers' request comments from the *Prior Question Tool* • Reviewers' feedback comments from the *Prior Question Tool* • Final version of students' written work • *Participant Characteristics Questionnaire* • *Peer Feedback Experience Questionnaire* • *Questionnaires for Learning Attitudes and Competencies*
Q2: What types of feedback comments do reviewers make, and how do they change as the peer feedback process iterates?	Comment analysis Quantitative description	• Reviewers' feedback comments from the *Prior Question Tool*
Q3: What were students' attitudes toward the peer feedback experience with interventional strategies?	Quantitative description	• Writers' responses on the *Helpful Feedback Survey* from the *HFSS Tool*
Q4: How closely did students adhere to the instructions they were given for the peer feedback process?	Quantitative description	• 1st draft • Writers' request comments from the *Prior Question Tool* • Reviewers' feedback comments from the *Prior Question Tool*

Due to the characteristics of the data, the use of inferential statistical analysis was necessarily limited. The number of participants was small. The numeric variables were often not normally distributed. Because multiple comments were generated by each participant, and multiple text units were often extracted from each comment, we cannot assume that the text units were statistically independent. Despite these constraints, the chi-square test was applied in several cases to determine the reliability of an observed result.

In the sections that follows, I present the methods of data analysis in the following order: 1) comment analysis, 2) analysis of the *Peer Feedback Experience Questionnaire*, and 3) case study.

5.4.1. Comment Analysis

Comments generated by writers in the *Prior Question Tool* and in *the Helpful Feedback Survey* were analyzed to identify what writers wanted or expected from peers' feedback, and what types of feedback writers perceived as helpful. Comments generated by reviewers in the *Prior Question Tool* were used to describe reviewers' comments in the peer feedback activities throughout the course. The analysis was based on *a priori* categories derived from previous studies in the literature.

Writers' requested comments and reviewers' actual feedback comments were coded. The coding categories were developed using the constant comparative technique which is commonly used in qualitative data analysis (Leech & Onwuegbuzie, 2011). Constant comparison is a strategy which uses an inductive coding approach and allows researchers to compare concurrently all incidents observed through the data analysis process (Goetz & LeCompte, 1981). While the technique was originally introduced by Glaser and Strauss (1999) as part of grounded theory, it can be applied to research that does not fit within the grounded theory framework (Fram, 2013; Maykut & Morehouse, 1994). According to Maykut and Morehouse (1994), the technique is suitable for researchers who aim to investigate a specific event represented in data. This technique enables researchers to systematically and thoroughly investigate collected data and inductively derive coding categories from an actual event (Maykut & Morehouse, 1994).

While the constant comparison technique was used to analyze both writers' requested comments and reviewers' feedback comments, the process for the reviewers' comments was slightly modified. A deductive coding approach was employed for the reviewers' comment analysis. Since feedback comments have been extensively analyzed in previous research (e.g., Ferris, 1997; Nelson & Schunn, 2009; Patchan et al., 2016; Tseng & Tsai, 2007), some a *priori* categories were adopted at the initial stage of categorization. A review of the feedback types used to identify the *a priori* categories is presented in the next chapter. The initial categories were refined by repeatedly revisiting the data gathered in the current research and adjusting categories as necessary to cover the data. For the writers' comments, the purpose was to develop categories that reflected the context in which the current research was conducted. Unlike the reviewers' comment analysis, there has been little research on writers' requested comments, even though the writers' requested comments authentically represent what

writers expect and believe they need from peer feedback. Coding categories were, therefore, developed using an inductive approach for writers' comments and, in the case of reviewers' comments, seeded by categories obtained from previous research (e.g., Lincoln & Guba, 1985; Maykut & Morehouse, 1994). To conduct the constant comparative analysis, I used the qualitative data analysis software, NVivo (released in March 2020). The process of coding and category development is fully described in the next section.

5.4.1.1. Coding Process

First, I used inductive comment analysis to investigate writers' comments and create a coding scheme. Second, I conducted deductive comment analysis of reviewers' comments. Detailed processes and findings are described immediately below.

5.4.1.1.1. Inductive Analysis of Writers' Comments

To derive themes and develop coding categories, writers' requested comments were analyzed inductively using the constant comparative method. Several steps were taken to identify themes by referring to suggestions from the previous studies (e.g., Glaser & Strauss, 1999; Leech & Onwuegbuzie, 2011). As shown in the Figure 5.2, I used four steps to categorize writers' comments.

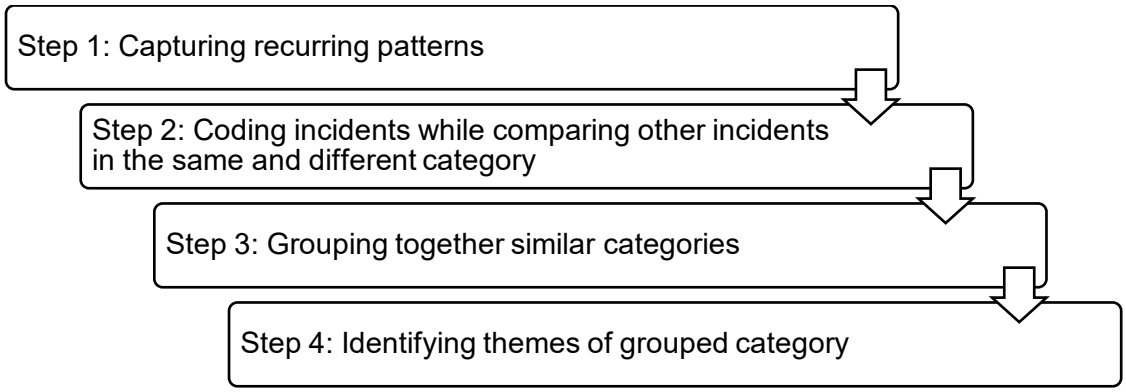


Figure 5.2 Summary of Coding Steps

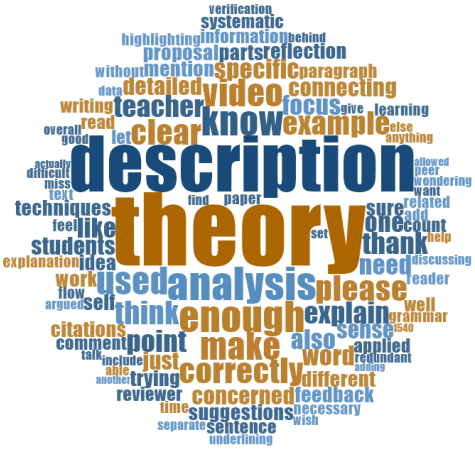
As a first step, the Word Frequency Query was run in NVivo to grasp roughly what words were repeatedly used in writers' comments on the *Prior Question Tool*. In NVivo, the option level 2 (exact matches, word with same stem) was selected among the text matching options. Word clouds generated by NVivo using the top 100 Word Frequency Query are shown in Figure 5.3. Also, the top 100 words from the Word

Frequency Query are given in Appendix E. This process allowed me to roughly capture frequently recurring words in the students' use of the *Prior Question Tool*.

Using the word clouds, an initial theme was developed from the Word Frequency Query results. The results indicated that most words high on the frequency list were drawn from the assignment evaluation criteria (see Figure 4.1 and Figure 4.2 in Chapter 4). Some of the words in the list include 'theory', 'description', 'video', 'analysis', 'focus', and 'proposal'. I interpret this to mean writers were concerned about whether they could satisfy the assignment requirements or the areas of evaluation. In other words, writers recognized the importance of evaluation criteria at an early stage of the peer feedback process and strove to meet the criteria. Some words in the list were difficult to categorize because they were out of context, so I flagged these and gave special attention to them during the inductive coding process. For instance, the word 'enough' emerged as one of highest frequency words. I carefully read each sentence that included this word and I noted potential themes to identify the most appropriate initial theme.

Assignment 1, 2, & 3

Assignment 1



Assignment 2

Assignment 3

Figure 5.3 Word Frequency Cloud – Writers' Comments on the Prior Question Tool

I began the inductive coding process while bearing in mind the thematic words that emerged from step 1. I identified "incidents" (Glaser & Strauss, 1999) which matched with the themes. The incident was treated as a coding unit. While researchers have used several approaches to determine a unit of analysis such as sentence base, meaning base, and message-block base (De Wever, Schellens, Valcke, & Keer, 2006; Strijbos, Martens, Prins, & Jochems , 2006), I used the meaning base to determine the unit of analysis. In meaning-based unit coding, units are blocks of words or chunks of sentences which include one or multiple theme(s). Therefore, some feedback comments are composed of several units. When the single unit contained multiple themes, each

unit was coded by assigning one or more categories. For example, the single unit from the writer's feedback comment as shown below was assigned to two categories: Content [a] and Organization [b]. The first underlined part was coded as Content, since the writer indicated her concern about the content of her description section. The second underlined part was coded as Organization, since she expressed that she needed to improve the arrangement of the section.

> I am having trouble sticking to the word count (I am at 1759) and feel that my motivation description might be confusing because it includes descriptions I have already done and do not want to repeat as it will really take me over the word count. I would just like to know your opinion on my descriptions [a] and if they are easy or hard to follow/ have extra info I do not need [b].

Each incident that appeared in the units was carefully coded to develop other initial themes.

Through this process, several other themes were identified. Some were related to the instructor's evaluation criteria. Two types of comments were identified: Request and Non-request. Most comments were coded as Request comments, since writers were encouraged to use the *Prior Question Tool* to indicate what kinds of feedback they would like. However, there were comments which did not fall into the Request type. Instead, they were intended to establish a smooth and positive connection with reviewers. The Non-request comments included expressions and phrases to enhance communication with reviewers, such as greetings and expressions of gratitude (e.g., *"hi", "thank you," "I appreciate…"*). The Non-request comments were excluded from the comment analysis in the current study, since the main purpose of analysing writer comments was to investigate what writers want from peer reviewers.

Once I became familiar with writers' request comments and coded all request-related incidents I undertook the third step, which was to refine and group by similarity each initial category. Finally, in the fourth step, I identified one main category (Focus) and four subcategories (Topic, Organization, Language, Format). The main category, Focus, refers to writers' primary areas of concern during their writing process. The focus areas were not only related to the evaluation criteria for the course assignment but also common writing conventions for good writing performance. The first subcategory, Topic, included writers' requests/concerns about relevance, degree of detail, specificity, and the logic of their written content/ideas. This subcategory also addresses the accuracy of

writers' subject knowledge (e.g., *"I'm not sure that my analysis of my video if the proposal is accurate. Do you think that the coherence principle [learning theory from educational psychology] is being violated? Should I choose a different video? or principle?"*).

Organization refers to how the content/ideas in the writing are arranged, related, and flow. It includes consistency, coherence, and flow of ideas and events. The Language subcategory mainly focuses on writing mechanics which concern grammar, writing rules, and spelling. A unit about choice of appropriate words would also be included in this subcategory. The request comments in which writers indicated concerns about writing formats such as a citation style, line format, and word limits were classified into the Format subcategory. Detailed descriptions of each subcategory and examples are provided in Table 5.9.

Table 5.9 Coding Scheme - Writers' Request Comment

Main category			
	Subcategory	Description	Examples
Focus			
	Topic	Requesting to check the accuracy/relevancy/clarity of their contents and/or subject knowledge. (e.g., knowledge of theory)	"Is my example a good example of Environmental structuring? / Is environmental structuring an appropriate choice of theory?" "I am concerned about whether my second focus fits well with the video since the video is not test oriented."
	Organization	Requesting to check the quality of their paragraph/unit arrangement. (e.g., order of ideas, organization, flow, coherence, transition)	"does the connection between the description and the analysis clear?" "In addition, I realize that my sections are quite large and I am unsure if I should alter them to have smaller paragraphs in each description/analysis section." "Is this paragraph too short? Should I be adding something else?"
	Language	Requesting to check the accuracy of their language use/mechanics. (e.g., spelling, grammar, sentence structure, word choice)	"How is my overall sentence structure and grammar?" "I think these are boring sentence starters but I'm not sure what to change it to." "Change to really think, or start thinking or just leave it?"
	Format	Requesting to check the appropriateness of their format use. (e.g., citation, line spacing, word count)	"I was unsure about my citing technique especially regarding the 25 Learning Principles in which there were multiple authors and articles for the concept I argued in my second point." "Do we require a references page? I can't find it in the instructions."

5.4.1.1.2. Deductive Analysis of Reviewers' Comments

Initially, I coded reviewers' feedback comments inductively using constant comparison. However, during the constant comparison analysis, feedback types used in past studies which fit with the themes of the current study emerged. Therefore, unlike the codes used for writers' request comments, a great proportion of the reviewers' codes were adapted from previous relevant literature. I assessed the coding scheme in the literature (see 3.4.1.1. Types of peer feedback in Chapter 3) and carefully selected and modified the coding categories and formed the coding scheme. Since the current study focuses on helpful comments for writers, the feedback types judged most likely to benefit writers were identified and included.

The current study adopted two main categories of comments (Affective and Cognitive) which previous research (e.g., Cheng & Hou, 2015; Cho & Cho, 2011; Lu & Law, 2012) showed could affect student learning positively or negatively. In addition, the Focus category, which emerged from my analysis of writers' comments, was also used. A summary of comment types is presented in Table 5.10.

Affective

An affective comment dimension was adopted in the current study. The affective dimension in the current study includes positive, neutral, and negative comment categories. During the constant comparison analysis process, other patterns were also identified. In some units, an affective tone shifted from positive to neutral and vice versa. Nelson and Schunn (2009) stated that negative feedback comments are often coupled with mitigation language to soften the tone of the comments. However, no combination category paired with negative comments was observed in the current study. Instead, the comments combining positive and neutral affect (Positive-Neutral, and Neutral-Positive) were often observed.

Cognitive

In my analysis, the cognitive dimension included codes for Identify Problem, Direction, Explanation, Direct Correction, and Confirmation. In terms of the Direction subcategory, previous studies have labeled this type of feedback as suggestions or solutions. In my research, the term directive feedback referred to actionable advice or suggestions to deal with a problem. The Confirmation subcategory was added after

constant comparative analysis to capture the nature of the peer feedback activities which are unique to the current study. Reviewers' comments were coded as Confirmation when reviewers affirmed a claim provided by writers as part of their prior question. This category was coded, therefore, only when the reviewer comment was in response to a question or statement provided by the writer. When reviewers did not agree with a writer's statement, it was not coded as confirmation. This category includes two different conditions: Confirmation Only and Confirmation And. Confirmation Only was coded when reviewers indicated only their agreement in their comment. When reviewers included other cognitive features with their confirmation, Confirmation And was coded. The following are examples of this category.

Example 1:
Writer 1: "Does this sound logical when compared to theory?"
Reviewer 1: "*I haven't thought of this when I was watching the video. I think it's a great point!"* (Confirmation Only)

Example 2:
Writer 2*:* "Is this sentence too long to understand??"
Reviewer 2: "*I think you can break up the sentence into two sentences. Rather having the brackets there I think that could be a second sentence on their own."* (Confirmation And – Direction Only)

During the constant comparison process, I observed that some coding units contained more than one cognitive subcategory. To address such cases, four combined subcategories were added: Identify Problem + Explanation, Identify Problem + Direction, Identify Problem + Explanation + Direction, and Explanation + Direction. For instance, Identify Problem + Explanation was coded when a unit of analysis included both Identify Problem and Explanation (see Example 3).

Example 3:
Reviewer 3: "*Don't forget to double space!* (Identify Problem) *I wouldn't necessarily mention this but I got marks off for forgetting to double space* (Explanation)*."* (Identify Problem + Explanation)

Table 5.10 Coding Scheme – Reviewers' Feedback Comment

Dimension		Description	Examples
	Subcategory		
Affective			
	Negative	Critical statements	(No Negative comments were identified in the current study) "'You didn't even do it!'' ''Badly written'' (Lu & Law, 2012, p. 265)
	Neutral	Neither negative nor positive	"Give more of an explanation of what this theory is, in order to then teach in the various forms." "The words/sentences in red means you might want to remove them from your paragraph."
	Positive	Positive statements	"This is good as it is very specific to the style of teaching." "Really good analysis! The connection you make between the theory and the clip are clear and concise!"
	Neutral-Positive	Providing neutral comments first, then stating positive comment later in the same unit	"Double-check some of those citations, as I am also unsure if they are entirely correct. Other than that, awesome job." "Just adding some more evidence and overall it looks really good!"
	Positive-Neutral	Stating positive comments first, then providing neutral comments later in the same unit	"I think your theories work well (I actually used the spatial contiguity for the same video as well!) The one problem would be that you use the exact same theory in one analysis and the proposal." "Overall this is a good idea. I encourage you to expand further (using examples) and referencing theories."

Dimension		Description	Examples
	Subcategory		
Cognitive			
	Confirmation ONLY	Confirming the questions/concerns raised by writers. (When reviewers were uncertain about their answers or disagree with the questions, this code does not apply.)	"Yes this makes sense as a theory good explanation." "I think this is clear enough for the readers to understand what you're trying to say!"
	Confirmation AND	Confirming the questions/concerns raised by writers AND added more related cognitive comments	"I agree that the pre-training principle would be effective. To clearly show why, I recommend clearly defining and comparing the personalization principle and the pre-training principle." "And yes your analysis is really short, please go in depth with the theory and refer back to the description section."
	Correction	Focusing on the correctness of work (e.g., grammatical, word choice & format correction) No explanation and/or direction are provided	"No comma needed." "Don't need the "'s"" "Tense: invited" "Take out apostrophe"
	Identify Problem (IP) ONLY	Identifying problems which need to be fixed	"Can you prove this?" "How is the teacher introducing a new math task? Via handout? Overhead projection?"
	IP + Explanation	Providing explanations or justification to the problem identified by reviewers	"Don't forget to double space! I wouldn't necessarily mention this but I got marks off for forgetting to double space." "Be careful here. Elaborative Interrogation is concerned with "why questions."""
	IP + Direction	Providing directions, suggestions, concepts, strategies, or solution for fixing the problems/the improvement of work	"This paragraph seems a little redundant and it can be more concise. I also feel like this paragraph will be more fitting in the description instead of analysis."
	IP + Explanation + Direction	Providing explanations and directions to the problem identified by reviewers	"I'm not quite sure about the time you put down here, because you use multiple times for the description/analysis… I would suggest writing down a segment of time. Ex: 0:58-1:37." "I don't think this part is necessary (especially if you are looking to decrease your word count), as it is a proposal of something to change, as such it is more suited for the proposal section."

Dimension		Description	Examples
	Subcategory		
Cognitive			
	Explanation ONLY	Providing explanations or justifications to the problem identified by reviewers. However, problems were not identified by reviewers but brought up by writers.	"The description and analysis relate well here, I think for this analysis to make sense, you need the sentence in your description. I don't think there is a problem with it." "I believe this paragraph contains a good amount of information so adding the cognitive load theory would be too excessive."
	Direction ONLY	Providing directions, suggestions, concepts, strategies, or solution for fixing the problems/the improvement of work. However, problems were not identified by reviewers but brought up by writers.	"I don't think you need to mention interleaved learning, unless you plan on incorporating the theory into your proposal." "Remember to clearly state what the learning theory is/consists of. Then make your argument using examples to justify whether you think the instructor applies it or not."
	Explanation + Direction	Providing explanations and direction to the problem identified by reviewers. However, problems were not identified by reviewers but brought up by writers.	"To connect the theory to the Description even more, maybe also mention here the 'lively conversation' that occurred. I recall metacognition also involved the sharing of differing points of views, but that might have been for middle school aged students." "I think you should provide more information. The analysis here is a little convoluted. You also didn't mention if the teacher did this well or not."

Interrater agreement was obtained by randomly selecting 15% of the first drafts for coding by another researcher. The sample included writers' request comments and reviewers' feedback comments from the first, second, and third assignments. The first coder (the investigator) identified the unit of analysis and assigned the coding category(s) simultaneously in NVivo. Before the selected draft was coded by the second coder, all coded categories were removed, but the segmented units were kept. Training was provided for the second coder, and coding notes (see Appendix F) which described detailed coding categories were supplied. The second coder assigned the category/categories based on the units segmented by the first coder. As shown in Table 5.11, Cohen's kappa coefficient was calculated to measure inter-rater reliability. The results indicated agreement mostly within the "good" range based on the interpretation suggested by Landis and Koch (1977).

Table 5.11 Inter-Rater Agreement: Percent Agreement & Cohen's Kappa

	Reviewer			Writer
	Affective	Cognitive	Focus	Focus
Agreement (%)	0.89	0.84	0.76	0.79
Kappa	0.74	0.84	0.63	0.60

Note. The initial Kappa value for the reviewer's cognitive dimension was fair (K = 0.40). The Kappa value shown in the table was calculated after a discussion between the two coders in which the second coder changed her coding in cases where she agreed with the rationale given by the first coder.

5.4.1.2. Quantitative Description of Request Comments, Peer Feedback Comments, Writer-Reviewer Interaction, Utilization Of Prior Question Tool

To address the first, second, and fourth research questions (Q1: What types of feedback comments were seen as helpful by writers, and what types did they use?; Q2: What types of feedback comments do reviewers make, and how do they change as the peer feedback process iterates?; Q4: How closely did students adhere to the instructions they were given for the peer feedback process?), the results of the frequency of request comments and peer feedback comments, the pattern of interaction between writers and reviewers during the peer feedback process, as well as the use of the *Prior Question Tool* were analyzed through quantitative descriptive analysis.

Quantitative descriptive analyses help researchers to distill abundant information and present meaningful information such as trends and variations in the targeted context through the process of describing data (Loeb, Dynarski, McFarland, Morris, Reardon, & Reber, 2017). According to Loeb et al. (2017), researchers who conduct such analyses can identify hidden patterns and unrevealed phenomena, and elucidate the foundation of the new phenomenon. These practices could allow researchers to "[uncover] a socially relevant 'truth' in the data" (p. 27).

5.4.1.2.1. Request Comments and Peer Feedback Comments

The frequency of each category of request and feedback comment was counted. The frequency of each category of comments generated by writers and reviewers was used to portray what student writers most often wanted or expected from peer feedback, and what types of feedback peer reviewers most often generated in the peer feedback activity with the intervention strategies. I also assessed shifts in the frequency of different types of feedback comments from the first to the second and the second to the third assignments. Lastly, part of the *Helpful Feedback Survey* asks writers to nominate

up to two most helpful feedback comments they received. The nominated feedback comments were also coded using the reviewers' coding scheme. The frequency of the coded units was also counted per each subcategory. This result was compared to the result from the reviewers' comment analysis and differences and similarities were described.

5.4.1.2.2. Writer-Reviewer Interaction

Writer-reviewer interaction was coded to understand the patterns of interaction from both from writers' and reviewers' viewpoints, and the change over time in the reviewers' feedback. The *Prior Question Tool* provided writers with an opportunity to communicate with peers who would review their assignments and provide feedback. Each writer could use the tool to communicate their concerns about their draft paper or make specific requests for feedback to the peer. According to other researchers, explicitly expressing writers' concerns or needs not only helps them to receive personalized feedback, but also helps peer reviewers to provide helpful and focused feedback for writers (Gielen, Tops, et al., 2010; Voet et al., 2018). From the standpoint of reviewers, obtaining information from writers regarding their concerns about their written expression of knowledge and their needs for feedback helps reviewers generate helpful feedback (Gielen, Peeters, et al., 2010; Nicol & Macfarlane-Dick, 2006).

Two coding schemes were used to analyze the types of the writer-reviewer interaction in the peer feedback process. First, the writer-reviewer interaction was coded from the writer's viewpoint. This coding scheme examined whether writers received a response to their request(s) from reviewers. Each writer's request comment was coded in three ways: (1) received a response from reviewer, (2) did not receive a response from reviewer, (3) no need to receive a response from reviewer. The third category includes writers' comments which do not require a response from reviewers (e.g., "I will do my citations and formatting later." "Please do not focus on grammar [I can do this on my own] unless of course you see something very problematic."). The second coding scheme reflected the reviewers' perspective. Each feedback comment was coded in two ways: (1) independent comment, (2) reply comment. A comment generated in response to a writers' request was coded as reply, and otherwise was coded as independent.

5.4.1.2.3. Prior Question Tool

Students' use of the *Prior Question Tool* was coded for writers and for reviewers respectively. Five codes were created for each role. The codes for the writer (and reviewer in parenthesis) were:

1. Used "Overall" & "Specific" section
2. Used "Overall" section only
3. Used "Specific" section only
4. Did not provide request (did not use tool)
5. No submission

The first, second, and third codes in both writers' and reviewers' comments were used to investigate the sections of the tool students used. The fourth code for writers was used when they submitted their first draft but did not provide any request comments. For reviewers this code was used when they provided feedback (e.g., typed feedback in the comment box embedded in the web-based LMS) but did not use the tool. The fifth code was used when the writer or reviewer did not participate the peer feedback activity.

5.4.2. Quantitative Description of Peer Feedback Experience Questionnaire

To understand how students perceived the peer feedback activity with the intervention tools, the results of the *Peer Feedback Experience Questionnaire* were analyzed through quantitative descriptive analysis. The subcategory mean scores from the *Peer Feedback Experience Questionnaire* were examined and compared. The data from the questionnaire were used to describe students' perceptions of peer feedback experience in the whole class and among three case study participants. Salient features of the results were identified and attempted to uncover patterns and phenomena.

5.4.3. Case Study

One of the goals of the current study is to fully describe writers' peer feedback experiences, which are complex and unique learning events. Various studies have investigated students' use of feedback in their writing (e.g., Faigley & Witte, 1981; Ferris,

1997). These studies analyzed each student's revision actions and/or the feedback which influenced their revisions. Since feedback-informed revision is a highly complex matter (Faigley & Witte, 1981), a comprehensive analysis and detailed description of individual writers' peer feedback process is needed to shine a spotlight on the phenomenon. A case study approach was selected to address the second part of the first research question: "What types of feedback comments were seen as helpful by writers, and what types did they use?"

Case study has been often utilized in the social sciences (Creswell, 2013; Thomas, 2011) and is one of the key research approaches in education (Hamilton & Corbett-Whittier, 2020). The essence of the case study method is illumination of concrete instances by describing selected cases in detail and in depth (Merriam, 1998). While the definition of case study varies across disciplines and scholars due to diverse themes and priorities of research (Thomas, 2011), in the current study, I used Stake's (1995) definition. In his terms, a case study is "the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances" (p. xi). He also asserted that both uniqueness and commonality should be spotlighted while capturing the complexity of a case during the case study process. During the process, researchers undergo various operations such as description, documentation, and interpretation of the case (Simons, 2009).

As described in Chapters 2 and 3, writers' use of feedback and revision action is complex and affected by various factors. By implementing the case study approach, I was able to identify the uniqueness and commonality in how individual writers responded to and experienced the peer feedback intervention described earlier in this chapter. The case study approach allows me as a researcher to gain further in-depth understanding of the writers' revision actions in the context of the peer feedback process, and to illustrate them in detail. Moreover, examining connections among the factors affecting writers' use of feedback and revision action helps me to capture and describe their peer feedback experiences comprehensively.

Research examining postsecondary students' revisions of their entire essays is rare. It is, therefore, important to provide a holistic analysis of individual students' revision behavior as well as their peer feedback experience. The case study approach is

especially apropos when researchers investigate the complexity of a psychosocial phenomenon by exploring richly contextualized data (Hamilton & Corbett-Whittier, 2020).

After each case was constructed, I implemented a comparative case study approach to investigate similarities and differences between cases. In comparative case study, two or more cases are compared and analyzed in detail (Kaarbo & Beasley, 1999). In the current study, three cases were selected. The aim was not to form concise, abstract generalizations but instead to contribute to future research by sharing dense knowledge, which includes limited, grounded generalizations such as concrete similarities or differences.

While generalization of the kind typically pursued in purely quantitative research is not a focus in the case-oriented approach, naturalistic generalizations can be made by readers through addressing their own experience and knowledge in the detailed descriptions of the case study (Stake, 1995). According to Stake (1995), naturalistic generalizations are “conclusions arrived at through personal engagement in life’s affairs or by vicarious experience so well constructed that the person feels as if it happened to themselves” (p. 85). Readers obtain information from cases, which are "vicarious experience,” to verify or modify their prior knowledge and form generalizations which can be shared with others or not. Therefore, detailed, personalized, descriptions of the case study help readers to form naturalistic generalizations. In the current study, I employed the case-oriented approach and systematically compared three students who showed different levels of writing ability regarding how their revision actions were impacted by the peer feedback experience.

5.4.3.1. Selecting Cases

The three cases presented below would be described by Stake (1995) as instrumental in the sense that they were selected to further the research agenda in this dissertation, rather than due to their intrinsic quality.

The criteria established to select the cases were as follows:

- submitted the first draft
- received at least two feedback comments from the assigned reviewer on the side margin (specific feedback)

- completed the study questionnaires (*Participant Characteristics Questionnaire, Peer Feedback Experience Questionnaire,* and *Questionnaires for Learning Attitudes and Competencies*)
- completed the *Helpful Feedback Survey*
- provided at least two feedback requests on the side margin (specific request)

Six out of the 31 participants met all the above criteria.

The purpose of the final case selection step was to find three participants who best represented the diverse range of ability demonstrated in the graded assignments. The second assignment score was chosen as the most suitable proxy for student ability in the context of the peer feedback intervention because that assignment incorporated all the tools designed to improve the peer feedback experience, namely the *Prior Question Tool* and the *HFSS* (the *Helpful Feedback Survey*, and the *Helpful Feedback List*) *Tool*. To select cases, the scores on the second assignment were converted to percentiles. Among the six participants who met the minimum selection criteria, I planned to select one case as a low ability student whose percentile rank on the second assignment was below 25, a second case as a medium ability student whose percentile rank was close to the 50th percentile, and a third case as a high ability student whose percentile rank was above the 75th percentile. Table 5.12 shows percentile ranks on the assignments and self-report instruments for the three selected cases. Identification numbers provided by the investigator were used to protect the participants' anonymity.

As seen in Table 5.12, the percentile rank of the low ability student did not fall below 25. In fact, none of the six eligible participants had assignment scores consistently below the 25th percentile. The seven students who performed below the 25th percentile in the second assignment failed to meet the selection criteria. One of them did not submit the first draft. Another only provided overall comments about the entire paper and received only corrective feedback which was provided in texts instead of using the comment box. Another provided only one specific comment, but it was a statement rather than a question or a request. Four of the students did not use the *Prior Question Tool*.

Table 5.12 Assignment Scores and Self-Report Scores for the Three Selected Cases (All in Percentiles).

	Low	Medium	High
Writer	A	B	C
Percentile rank by Assignment score (%)			
Assignment 1	66.1	21.0	96.8
Assignment 2	35.5	54.8	93.5
Assignment 3	58.1	75.8	82.3
Total (Assignment 1+2+3)	59.7	54.8	93.5
Percentile rank by SEWS (%)			
Ideation	51.9	13.5	7.7
Conventions	48.1	23.1	3.8
Self-regulation	55.8	11.5	86.5
Total	59.6	11.5	19.2
Percentile rank by WSES (%)			
Writing task	44.2	80.8	15.4
Writing skill	59.6	25.0	7.7
Total	61.5	50.0	7.7
Percentile rank by Motivated Strategies for Learning Questionnaire (%)			
Motivation:			
Intrinsic Goal Orientation	76.8	48.2	3.6
Extrinsic Goal Orientation	89.7	44.8	3.4
Task Value	86.2	65.5	37.9
Control of Learning Beliefs	89.7	89.7	20.7
Self-Efficacy for Learning & Performance	81.0	17.2	6.9
Learning strategies:			
Critical Thinking	98.3	17.2	27.6
Metacognitive Self-Regulation	83.9	71.4	3.6
Effort Regulation	69.0	55.2	24.1
Percentile rank by Achievement Goal Questionnaire (%)			
Mastery-approach goal	79.3	34.5	34.5
Performance-approach goal	89.7	6.9	56.9
Performance-avoidance goal	67.2	13.8	94.8
Percentile rank by self-reported GPA (%)	72.2	*Don't know*	72.2
Gender	Female	Female	Female
1st language	English	English	English
Peer assessment experience in the past (# of times)	No	Yes	Yes

Note. The "low", "medium", and "high" designation refers only to performance on assignment 2. There is little difference in total assignment performance between cases A and B.

Thus, I was unable to select, as originally intended, three cases that were equidistantly separated in a normative sense on the Assignment 2 score. Instead, I used other variables (both performance scores and self-reported characteristics) to ensure the selections substantially represented variation observed among the participants. Consequently, while the three cases are labelled as low, medium, and high in ability, there is no consistent pattern of difference between Case A and Case B in performance on the three assignments. As seen in Table 5.13, the scores of the three essay assignments were positively correlated. The table also illustrates that the second assignment score did not correlate significantly with most of the self-reported scores. Only two scores, the Self-regulation subscale ($r = .393$, $p < 0.05$) in the *SEWS* and the self-reported GPA ($r = .415$, $p < 0.05$), showed significant correlations. This is somewhat surprising considering that factors such as self-efficacy and motivation are often reported as contributing to students' academic performance (Pajares, 2003). The weak relationship between most self-reported scores and performance scores led to the result that the selected case with a relatively low Assignment 2 score had a higher percentile ranking in some self-reported scores than the middle and high ability students. Correlations among self-reports are presented in Appendix G.

Table 5.13 Pearson's Correlation between Assignment 2 Score and Self-Reported Scores (N ranges from 23 to 31)

		1	2	3	4
	Assignments				
1	Assignment 1	1			
2	Assignment 2	.570**	1		
3	Assignment 3	.544**	.641**	1	
4	Total (Assignment 1+2+3)	.822**	.876**	.853**	1
	SEWS				
5	Ideation	0.032	0.200	0.072	0.125
6	Conventions	0.106	-0.124	-0.066	-0.032
7	Self-regulation	0.364	.393*	0.291	.426*
8	Total	0.259	0.244	0.165	0.273
	WSES				
9	Writing task	-0.260	0.042	-0.106	-0.130
10	Writing skill	0.208	-0.107	-0.058	0.021
11	Total	-0.126	-0.009	-0.108	-0.096
	MSLQ: Motivation				
12	Intrinsic Goal Orientation	-0.073	-0.227	-0.018	-0.134
13	Extrinsic Goal Orientation	-0.008	-0.020	-0.074	-0.039
14	Task Value	.430*	0.195	.382*	.391*
15	Control of Learning Beliefs	-0.001	-0.114	0.148	0.005
16	Self-Efficacy for Learning & Performance	-0.004	0.013	0.076	0.032
	MSLQ: Learning strategies				
17	Critical Thinking	0.131	-0.278	-0.101	-0.106
18	Metacognitive Self-Regulation	-0.019	0.108	0.086	0.070
19	Effort Regulation	0.362	0.279	0.179	0.327
	AGQ				
20	Mastery-approach goal	0.149	0.171	.449*	0.296
21	Performance-approach goal	.388*	0.114	-0.034	0.188
22	Performance-avoidance goal	0.329	0.026	0.043	0.155
23	**Self-reported GPA**	0.026	.415*	0.168	0.246

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
Note. Numbers highlight yellow indicate the correlation between the Assignment 2 score and other self-reported scores.

Writers' benefits from the peer feedback experience vary due to the complexity of the peer feedback process. Several studies have attempted to explore the influence of writers' individual differences on what and how they learn from their peer feedback experience. The predictive capacity of many variables, such as grade on a similar essay

from a previous course (Huisman et al., 2017), thinking style (Lin et al., 2001), verbal and writing score from the SAT, score on an initial draft, and grade from a composition course in the previous semester (Patchan & Schunn, 2016), have been investigated. However, a systematic understanding of what student characteristics contribute to positive outcomes in the peer feedback process is still lacking. Therefore, plausible interpretations of prior performance scores and self-report scores collected in the present research were considered in the case study analysis.

5.4.3.2. Revision Analysis

The revision actions were analyzed based on the taxonomy developed by Faigley and Witte (1981). They identified two types of revision changes: Surface Changes and Meaning Changes. Each category consists of two subcategories: (a) Formal Changes and Meaning-Preserving Changes for Surface Changes, (b) Microstructure Changes and Macrostructure Changes for Meaning Changes. A description of each category is presented in Table 5.4.

Table 5.14 A Taxonomy of Revision Changes

Label	Definitions and examples
Surface Changes	Revisions that do not change any information/idea in the original writing
Formal Changes	Mechanical changes such as "spelling; tense, number, and modality; abbreviations; punctuation; and format" (p. 402)
Meaning-Preserving Changes	Paraphrasing or otherwise expressing the same information/idea without changing the meaning of the original writing
Meaning Changes	Alters the meaning of the information/idea
Microstructure Changes	Does not change the concepts in summary, even though items/units were revised "Barton Springs does not fit an outsider's image of Texas. It is an eighth-mile long unchlorinated pool in a natural limestone creekbed. → Barton Springs does not fit an outsider's image of Texas. It is an eighth-mile long, unchlorinated pool in a natural limestone creekbed, fed by 27 million gallons of 68-degree water from the Edward's Acqifer each day." (p. 405)
Macrostructure Changes	Changes the meaning of summary when items/units were revised "Draft 1 It's hard to think about places like Houston, San Antonio, or Dallas without thinking about endlessly sprouting suburbs, Taco Bells, expanding city limits, and mushrooming property values. Growth seems to be overtaking Texas at a breathtaking rate, often at the expense of the central city areas which helped to spawn that growth in the first place. The action often follows the growth outward-industry moves out to be close to the bedroom communities, restaurants and theaters follow on their heels, and before long there is nothing left in the inner city but vacancy signs." "Draft 2 For cities all over America it's a life or death situation, and for many what happens in the 80's will decide their fate. The picture for many is not promising, in the face of massive spending cuts to budgets for programs. Grants for urban renewal could slow to a trickle or stop. The city governments themselves may be unable to make up the difference and the proposed rebuilding they have planned may become an unfulfilled dream." (p. 404-405)

Note. Description was summarized from "Analyzing Revision," by Faigley and Witte, 1981, *College Composition and Communication*, 32, p. 402-405, and examples were adapted from the same article.

To quantify the changes from the first draft and the final version, the number of revisions indicated by the MS Word Compare Documents tool was reported. Five options (moves, comments, case changes, tables, and field) in the Comparison Settings were selected.

This chapter has described the research designs and methods used to address the research questions. The chapter that follows presents trends evident among all participants before focusing on the individual actions through the case analysis. The results are presented in the same order as the data analysis section (5.4): (1) comment

analysis, (2) analysis of the *Peer Feedback Experience Questionnaire*, and (3) case study.

Chapter 6.

Results

This research investigated writers' expressed needs for peer feedback and what types of feedback comments they found helpful. Writers' reactions to the feedback they received were investigated in detail, and in conjunction with writers' characteristics. The types of feedback comments constructed by reviewers were classified to examine the compatibility between writers' expectations and reviewers' practices. Students' attitudes toward the peer feedback experience were also assessed.

This chapter presents the results of the three main analyses mentioned in the previous chapter: comment analysis in section 6.1, quantitative description in section 6.2, and case studies in section 6.3. Comment analysis was used to examine writers' request comments, reviewers' feedback comments, and comments regarded as helpful by writers. I also described changes in the frequencies of different types of feedback across the three consecutive peer feedback activities. Following these analyses, I present and interpret descriptive statistics concerning responses to the *Peer Feedback Experience Questionnaire*, writer-reviewer interactions, and the use of the *Prior Question Tool*. Finally, in the case study section, I portray the detailed process of writers' revision actions and their relationship with coded data.

6.1. Comment Analysis

Several key findings emerged through this analysis. I analyzed the writers' and reviewers' comments based on their frequency. Also, I investigated the relationship between reviewers' feedback and helpful feedback nominated by the writers.

6.1.1. Frequency of Comment Categories

Using NVivo, all writers' request comments and reviewers' feedback comments were coded according to the final category definitions (see Figure 6.1) per unit, and the frequency with which each code occurred was counted. There was a total of 1526 identified units (1208 reviewers' feedback units plus 318 writers' request units). For the reviewers' comments, 1208 affective codes were assigned (one for each comment unit),

1250 cognitive codes were assigned, and 1258 focus codes were assigned. Detailed descriptions of the results for each role are presented in the following sections.

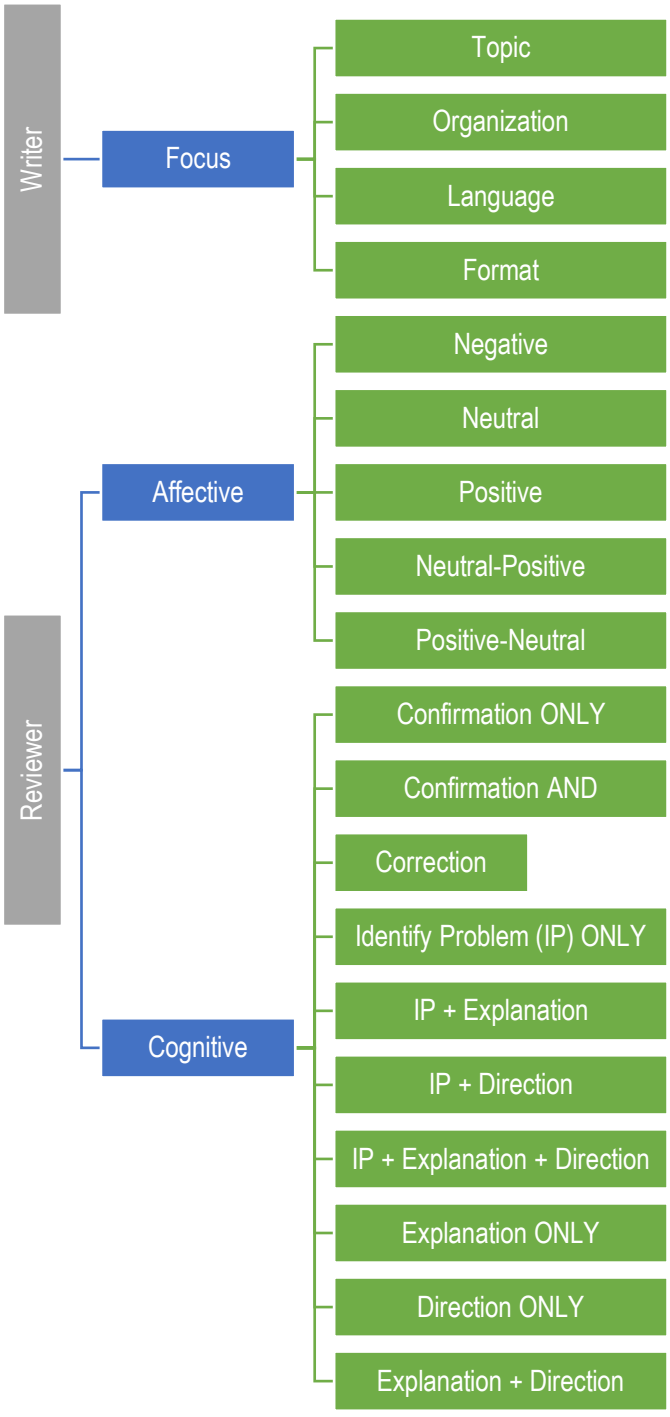


Figure 6.1 Overview of the Full Coding Scheme

6.1.1.1. Writers

The writers' request comments were analyzed to determine what types of feedback comments they viewed as helpful (RQ1). Table 6.1 illustrates the breakdown of the frequency of request units in each category. The categories were not mutually exclusive, meaning that some of the 318 request units were assigned (coded) to more than one category. There were 330 assignments of units to categories (codes) over three peer feedback assignments. A chi-square goodness of fit test was conducted on the Total column in Table 6.1 to test whether most units (> 50%) would be categorized as Topic in the population. The frequency of Topic units was found to significantly exceed the frequency of non-topic units, $X^2(1, N = 318) = 43.79$, $p < .001$, Cramer's $V = 0.37$. The effect size can be regarded as medium (Cohen, 1988) and was due to students requesting topic-related feedback more than all other types combined.

The bar chart (see Figure 6.2) shows that the number of requests by writers coded as Topic increased in every assignment (Assignment 1: 62, Assignment 2: 68, Assignment 3: 82). On the other hand, writers' requests coded under the Format code reduced in each assignment (Assignment 1: 16, Assignment 2: 8, Assignment 3: 3). There was little change over time in the number of requests regarding Organization and Language. In total, 37 request units did not indicate a focus and were not categorized (e.g., "Any other suggestions?" and "Please let me know if I missed anything.").

Table 6.1 Focus of Writer Request Comments (by Units)

	Assignment 1	Assignment 2	Assignment 3	Total
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
	n = 98	n= 104	*n* = 116	*N* = 318
Focus				
Topic	62 (63.3)	68 (65.4)	82 (75.6)	218 (68.6)
Organization	12 (12.2)	13 (12.5)	9 (7.8)	34 (10.7)
Language	5 (5.1)	7 (6.7)	9 (7.8)	21 (6.6)
Format	16 (16.3)	8 (7.7)	3 (2.6)	27 (8.5)
No focus	11 (11.2)	10 (9.6)	16 (13.8)	37 (11.6)
Total	106 (108.2)	106 (101.9)	125 (107.8)	337 (106.0)

Note. Sample size (N) is the number of text units that were analyzed. The categories were not mutually exclusive — some units were assigned to more than one category. Therefore, percentages sum to more than 100.

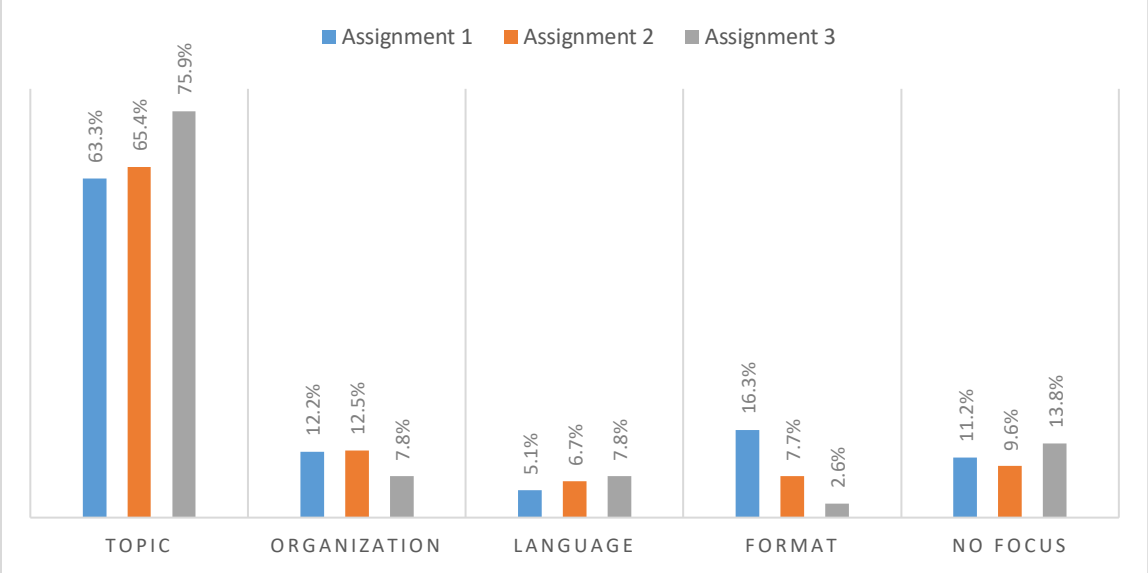


Figure 6.2 Focus of Writer Request Comments (by Units)

6.1.1.2. Reviewers

To address the second research question (What types of feedback comments do reviewers make, and how do they change as the peer feedback process iterates?), I applied the categories identified in Chapter 5. Table 6.2 presents the frequency of each type of comment. Note that subcategories of the Cognitive dimension were not mutually exclusive, and likewise for the subcategories of the Focus dimension. This means that, like the Focus category used for coding writers' comments, two or more different codes in the Cognitive and Focus dimensions were sometimes assigned to one feedback unit. Thus, the total percentage of coded feedback units for each of these dimensions may

exceed 100%. Also, for each of these dimensions some units could not be categorized because none of the feedback types for that dimension could be applied. For example, “This is a very structured and easy-to-follow paper. Well done with that regard!” (Cognitive: no cognitive; Focus: Organization) and “My main concern is that your paper is not actually done, but I’m sure you knew that.” (Cognitive: Identify Problem; Focus: no focus).

In the Affective dimension, over ¾ of the feedback comments were purely Neutral and most of the remainder were purely Positive. No Negative comments were identified. A chi-square goodness of fit test was conducted on the Total column in Table 6.2 to detect whether there were significantly more purely Neutral comments than comments that presented any positive tone (combined Positive, Positive-Neutral, and Neutral-Positive comments). The dominance of purely Neutral comments was statistically detected, $X^2(1, N = 1208) = 344.10$, $p < .001$, Cramer’s $V = 0.53$. The effect size can be regarded as large (Cohen, 1988) and was due to reviewers writing far more purely neutral comments than comments with any other affective tone. The first assignment had the greatest proportion of reviewer comments (30.2%) featuring a positive tone (Positive, Positive-Neutral, and Neutral-Positive), the proportion being lower in the second (17.7%) and third (23.6%) assignments.

In the Cognitive dimension, the use of Identify Problem and Direction were relatively common, often in combination with each other or with other cognitive categories. A chi-square goodness of fit test was conducted to test whether greater than half the units would feature Identify Problem in the population. The frequency of units featuring Identify Problem alone or in combination with other cognitive categories (707) was found to significantly exceed the frequency of units which did not feature Identify Problem, $X^2(1, N = 1208) = 35.13$, $p < .001$, Cramer’s $V = 0.17$. The effect size was small (Cohen, 1988) but nevertheless indicates significantly greater than half of reviewers’ comments featured problem identification. A chi-square goodness of fit test was conducted to test whether significantly greater than half the units featured Direction. The frequency of units featuring Direction alone or in combination with other cognitive categories (643) was found to significantly exceed the frequency of units which did not feature Direction, $X^2(1, N = 1208) = 5.04$, $p < .025$, Cramer’s $V = 0.06$. The effect size was small (Cohen, 1988) but nevertheless indicated that significantly more than half of reviewers’ comments featured Direction.

It should be noted that a high percentage of the corrective comments appeared in the second assignment (20.5%), and the percentage was quite low in the first (7.4%) and the third (9.8%) assignments compared with Explanation + Direction (see Figure 6.3). Confirmation comments, which indicate reviewers' agreement with the questions or concerns raised by the writers, were relatively rare. Note that constructing a Confirmation AND comment required the reviewer to carefully review and judge the issues raised by the writers and provide direction or explanations accordingly. In such cases the reviewers did not merely provide a simple response such as yes or no, but also spent time providing additional meaning. Feedback including explanations was also fairly rare. This result is consistent with the study by Lu and Law (2012).

In the Focus dimension, over half the comments were about the topic of the essay. A chi-square goodness of fit test found significantly greater than half the units focused on topic, $X^2(1, N = 1208) = 8.28$, $p = .004$, Cramer's $V = 0.08$. Approximately 30% of the comments were about language mechanics, followed by Organization (9.8%) and Format (8.1%). Interestingly, the number of Organization and Format comments continuously decreased from assignment 1 to assignment 3, but the number of the Language comments peaked markedly in assignment 2.

Table 6.2 Frequency and Types of Reviewers' Feedback Comments

	Assignment 1	Assignment 2	Assignment 3	Total
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
	n = 364	*n* = 493	*n* = 351	*N* = 1208
Affective				
Positive	61 (16.8)	66 (13.4)	46 (13.1)	173 (14.3)
Neutral	254 (69.8)	406 (82.4)	268 (76.4)	928 (76.8)
Negative	0 (0)	0 (0)	0 (0)	0 (0)
Positive-Neutral	43 (11.8)	21 (4.3)	32 (9.1)	96 (7.9)
Neutral-Positive	6 (1.6)	0 (0)	5 (1.4)	11 (0.9)
Total	364 (100)	493 (100)	351 (100)	1208 (100)
Cognitive				
Confirmation ONLY	10 (2.7)	10 (2.0)	6 (1.7)	26 (2.1)
Confirmation AND	15 (4.1)	14 (2.8)	10 (2.8)	39 (3.2)
Correction	27 (7.4)	101 (20.5)	35 (9.8)	163 (13.4)
Identify Problem (IP) ONLY	51 (14.0)	59 (12.0)	40 (11.2)	150 (12.4)
IP + Explanation	5 (1.4)	14 (2.8)	14 (3.9)	33 (2.7)
IP + Direction	125 (34.3)	134 (27.2)	141 (39.4)	400 (32.9)
IP + Explanation + Direction	34 (9.3)	54 (11.0)	36(10.1)	124 (10.2)
Explanation ONLY	13 (3.6)	8 (1.6)	2 (0.6)	23 (1.9)
Direction ONLY	34 (9.3)	27 (5.5)	23 (6.4)	84 (6.9)
Explanation + Direction ONLY	8 (2.2)	19 (3.9)	8 (2.2)	35 (2.9)
No cognitive	58 (15.9)	65 (13.2)	50 (14.0)	173 (14.3)
Total	380 (104.4)	505 (102.6)	365 (102.0)	1250 (103.0)
Focus				
Topic	197 (54.1)	225 (45.7)	232 (64.8)	654 (53.9)
Organization	51 (14.0)	40 (8.1)	28 (7.8)	119 (9.8)
Language	86 (23.6)	163 (33.1)	79 (22.1)	328 (27.0)
Format	48 (13.2)	30 (6.1)	20 (5.6)	98 (8.1)
No focus	11 (3.0)	36 (7.3)	12 (3.4)	59 (4.9)
Total	393 (108.0)	494 (100.4)	371 (103.6)	1258 (103.6)

Note. Sample size (*N*) is the number of text units that were analyzed. The categories of the Cognitive and Focus dimensions were not mutually exclusive — some units were assigned to more than one category. Therefore, percentages sum to more than 100.

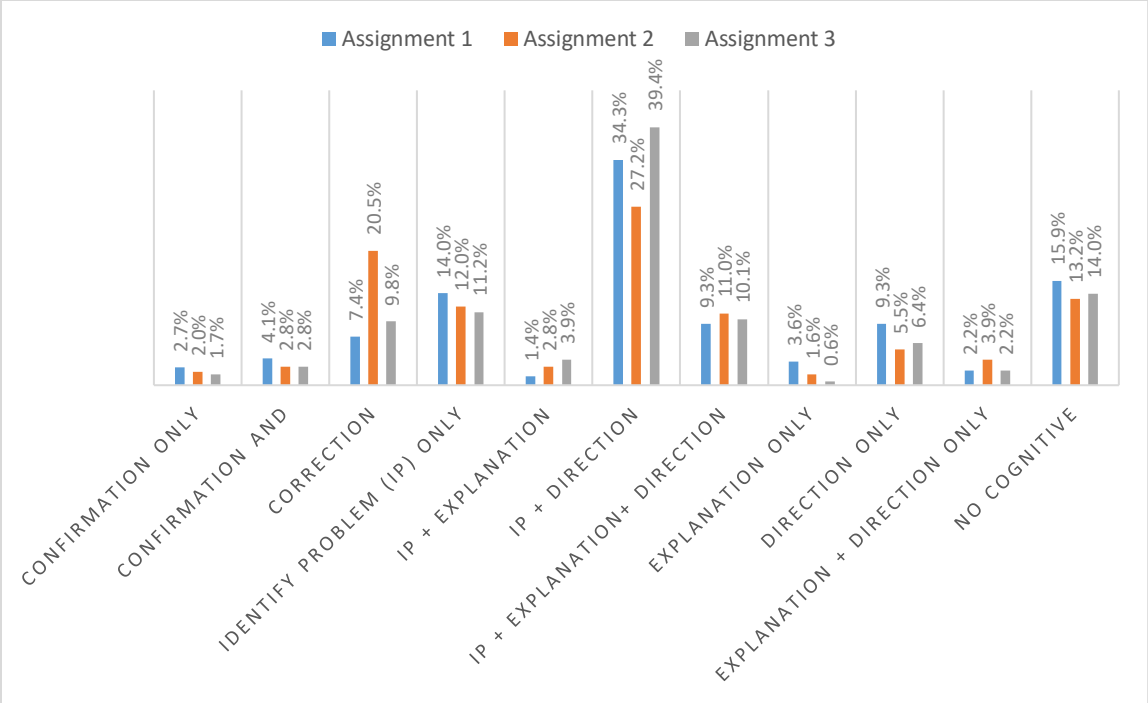


Figure 6.3 Percentage and Types of Reviewers' Cognitive Comments by Assignment

6.1.2. Helpful Feedback from the Writer's Perspective

The instructor had the students complete the *Helpful Feedback Survey* in class after the first and the second assignment. Of the 31 participants, 29 writers completed the survey in the first assignment, and 22 did so in the second assignment. The *Helpful Feedback Survey* was incorporated in the *HFSS Tool* and consisted of a question part and a survey part. The results of the question part of the survey are presented in Table 6.3.

Chi-square goodness of fit tests were conducted on the frequency of writers reporting comments as helpful or not helpful in assignments 1 and 2 (Table 6.3). Those who did not respond or reported "don't know" were excluded. For assignment 1, the frequency of helpful and not helpful responses differed significantly from a uniform distribution, $X^2(1, N = 21) = 10.71$, $p = .001$, Cramer's $V = 0.71$. The deviation from uniformity was large (Cohen, 1988) and was due to students more often reporting that the feedback they received was helpful. For assignment 2, there was no significant difference between the frequencies of helpful and not helpful responses, $X^2(1, N = 20) = 3.20$, $p = .074$, Cramer's $V = 0.40$. Given the large significant effect for assignment 1

together with the borderline significance and moderate effect size for the assignment 2 results, it is fair to say that, overall, students were more likely to report peer feedback as helpful than not helpful.

Table 6.3 Summary of Helpful Feedback Survey

	Assignment 1	Assignment 2
	Frequency (%)	Frequency (%)
Helpful	18 (62.1)	14 (63.6)
Not helpful	3 (10.3)	6 (27.3)
Don't know	8 (27.6)	2 (9.1)
Total	29 (100)	22 (100)

To understand what types of peer feedback writers perceived as helpful, the *Helpful Feedback Survey* was administered. Using this survey, writers nominated up to two "most helpful" feedback comments after the first and the second assignments. The nominated comments were coded with the same coding scheme I previously reported for reviewer comments (see Table 6.4).

Regarding affective tone, Neutral comments were most frequently nominated as helpful in both assignments. The dominance of purely Neutral comments shown in Table 6.4 was statistically detected, $X^2(1, N = 60) = 13.08$, $p < .001$, Cramer's $V = 0.47$. The effect size can be regarded as large (Cohen, 1988) and was due to writers nominating far more purely neutral comments than all comments with other affective tones combined.

In the Cognitive dimension, overall, Problem Identification + Direction feedback was the most preferred combination of feedback types (50.0%), followed by Problem Identification + Direction + Explanation feedback (18.3%), and Direction Only feedback (11.7%). Notably, no comments featuring Problem Identification + Explanation, Explanation Only, and Correction were nominated. The frequency of nominated feedback units featuring Identify Problem alone or in combination with other cognitive categories (45) was found to significantly exceed the frequency of feedback units which did not feature Identify Problem, $X^2(1, N = 60) = 15.00$, $p < .001$, Cramer's $V = 0.50$. The effect size was large (Cohen, 1988) and was due to significantly more than half of the nominated comments featuring problem identification. The frequency of nominated units

featuring Direction alone or in combination with other cognitive categories (51) was found to significantly exceed the frequency of units which did not feature Direction, X^2(1, N = 60) = 29.40, p < .001, Cramer's V = 0.70. The effect size was large (Cohen, 1988) and was due to significantly greater than half of the nominated comments featuring Direction. The number of nominated comments featuring Problem Identification + Direction + Explanation increased from Assignment 1 (15.2%) to Assignment 2 (22.2%), whereas the number of Direction Only comments decreased from 15.2% to 7.4%. Direction + Explanation feedback (11.1%) was only nominated in the second assignment.

With respect to the Focus dimension, the most nominated type of feedback was Topic (75.0%). Only a few Organization (15%), Format (8.3%), and Language (6.7%) comment units were nominated. A chi-square goodness of fit test found significantly greater than half the units focused on Topic, X^2(1, N = 60) = 15.00, p < .001, Cramer's V = 0.50. In the first assignment, Format was the second most frequently nominated category (15.2%); however, no comments of this type were nominated in the second assignment. Finally, the specific comments provided in the side-margin were nominated as helpful far more often (73.8%) than comments addressing the draft as a whole (see Table 6.5).

The results shown in Table 6.4 clearly demonstrate that, on the whole, writers valued reviewers' feedback about the topic of their essays that identified a problem and provided directions with a neutral affective tone. In addition, most writers appreciated the specific feedback provided in the side-margin rather than more generic overall feedback. Considering the findings of prior research, it is interesting that emotionally Positive feedback was not nominated as helpful as frequently as emotionally Neutral feedback. More noteworthy is that the writers perceived the feedback in which problems were pointed out by reviewers as more helpful than feedback responding to the questions brought up by the writers themselves.

To investigate the relationship between the types of feedback regarded as helpful by writers and the types provided by the reviewers, the frequency of the feedback comments nominated by the writers and each type of the feedback comments constructed by the reviewers were compared as paired columns in Table 6.6 and paired bars in Figure 6.2. The results indicated some similarities and differences between the

preferred and provided types of feedback. In terms of the Affective dimension, no obvious difference between the reviewers' feedback and the helpful feedback was observed. However, considerable divergence is evident in some of the Cognitive comment types. While the proportion of directive feedback about a problem nominated by writers was 50%, only 32.9% of this type of feedback was composed by the reviewers. Moreover, while no writers nominated the corrective feedback as being the most helpful, 13.4% of the feedback provided by reviewers was of this type. Problem Identification feedback by itself was rarely appreciated by the writers (6.7%), but 12.4% of the feedback was of this type. With respect to the Focus category, Topic feedback was highly supported by the writers (75.0%), whereas only 53.9% of the reviewers' coded feedback was of this type. The proportion of Language feedback composed by the reviewers was relatively high (27%), although this feedback was nominated by writers as most helpful a very small proportion of the time (6.7%).

Table 6.4 Frequency of Types of Feedback Comments Selected by Writers

	Assignment 1	Assignment 2	Total
	Frequency (%)	Frequency (%)	Frequency (%)
	n = 33	*n* = 27	*N* = 60
Affective			
Positive	3(9.1)	1 (3.7)	4 (6.7)
Neutral	24 (72.7)	21 (74.1)	44 (73.3)
Negative	0 (0)	0 (0)	0 (0)
Positive-Neutral	5 (15.2)	5 (18.5)	10 (16.7)
Neutral-Positive	1 (3.0)	1 (3.7)	2 (3.3)
Total	33 (100)	27 (100)	60 (100)
Cognitive			
Confirmation ONLY	3 (9.1)	0 (0)	3 (5.0)
Confirmation AND	2 (6.1)	0 (0)	2 (3.3)
Correction	0 (0)	0 (0)	0 (0)
Identify Problem (IP) ONLY	2 (6.1)	2 (7.4)	4 (6.7)
IP + Explanation	0 (0)	0 (0)	0 (0)
IP + Direction	16 (48.5)	14 (51.9)	30 (50.0)
IP + Explanation + Direction	5 (15.2)	6 (22.2)	11 (18.3)
Explanation ONLY	0 (0)	0 (0)	0 (0)
Direction ONLY	5 (15.2)	2 (7.4)	7 (11.7)
Explanation + Direction ONLY	0 (0)	3 (11.1)	3 (5.0)
Total	33 (100)	27 (100)	60 (100)
Focus			
Topic	23 (69.7)	22 (81.5)	45 (75.0)
Organization	4 (12.1)	5 (18.5)	9 (15.0)
Language	3 (9.1)	1 (3.7)	4 (6.7)
Format	5 (15.2)	0 (0)	5 (8.3)
No focus	0 (0)	1 (3.7)	1 (1.7)
Total	35 (106.1)	29 (107.4)	64 (106.7)

Note. Sample size (N) is the number of text units that were analyzed. The categories of the Focus dimension were not mutually exclusive. Therefore, percentages for that dimension sum to more than 100.

Table 6.5 Frequency of Feedback Comment Locations Selected by Writers

Prior Question Tool	Assignment 1	Assignment 2	Total
	Frequency (%)	Frequency (%)	Frequency (%)
Overall section	5 (15.6)	7 (24.1)	12 (19.7)
Specific section	23 (71.9)	22 (75.9)	45 (73.8)
Other	4 (12.5)	0 (0)	4 (6.6)
Total	32 (100)	29 (100)	61 (100)

Table 6.6 Comparison between Reviewers' Feedback and Helpful Feedback Selected by Writers

	Assignment 1		Assignment 2		Total	
	Helpful Feedback	Reviewer's Feedback	Helpful Feedback	Reviewer's Feedback	Helpful Feedback	Reviewer's Feedback
Affective						
Positive	9.1%	16.8%	3.7%	13.4%	6.7%	14.3%
Neutral	72.7%	69.8%	74.1%	82.4%	73.3%	76.8%
Negative	0%	0%	0%	0%	0%	0%
Positive-Neutral	15.2%	11.8%	18.5%	4.3%	16.7%	7.9%
Neutral-Positive	3.0%	1.6%	3.7%	0%	3.3%	0.9%
Cognitive						
Confirmation ONLY	9.1%	2.7%	0%	2.0%	5.0%	2.1%
Confirmation AND	6.1%	4.1%	0%	2.8%	3.3%	3.2%
Correction	0%	7.4%	0%	20.5%	0%	13.4%
Identify problem ONLY	6.1%	14.0%	7.4%	12.0%	6.7%	12.4%
+ Explanation	0%	1.4%	0%	2.8%	0%	2.7%
+ Direction	48.5%	34.3%	51.9%	27.2%	50.0%	32.9%
+ Explanation+ Direction	15.2%	9.3%	22.2%	11.0%	18.3%	10.2%
Explanation ONLY	0%	3.6%	0%	1.6%	0%	1.9%
Direction ONLY	15.2%	9.3%	7.4%	5.5%	11.7%	6.9%
Explanation + Direction ONLY	0%	2.2%	11.1%	3.9%	5.0%	2.9%
No cognitive		15.9%		13.2%		14.3%
Focus						
Topic	69.7%	54.1%	81.5%	45.7%	75.0%	53.9%
Organization	12.1%	14.0%	18.5%	8.1%	15.0%	9.8%
Language	9.1%	23.6%	3.7%	33.1%	6.7%	27.0%
Format	15.2%	13.2%	0.0%	6.1%	8.3%	8.1%
No focus	0%	3.0%	3.7%	7.3%	1.7%	4.9%

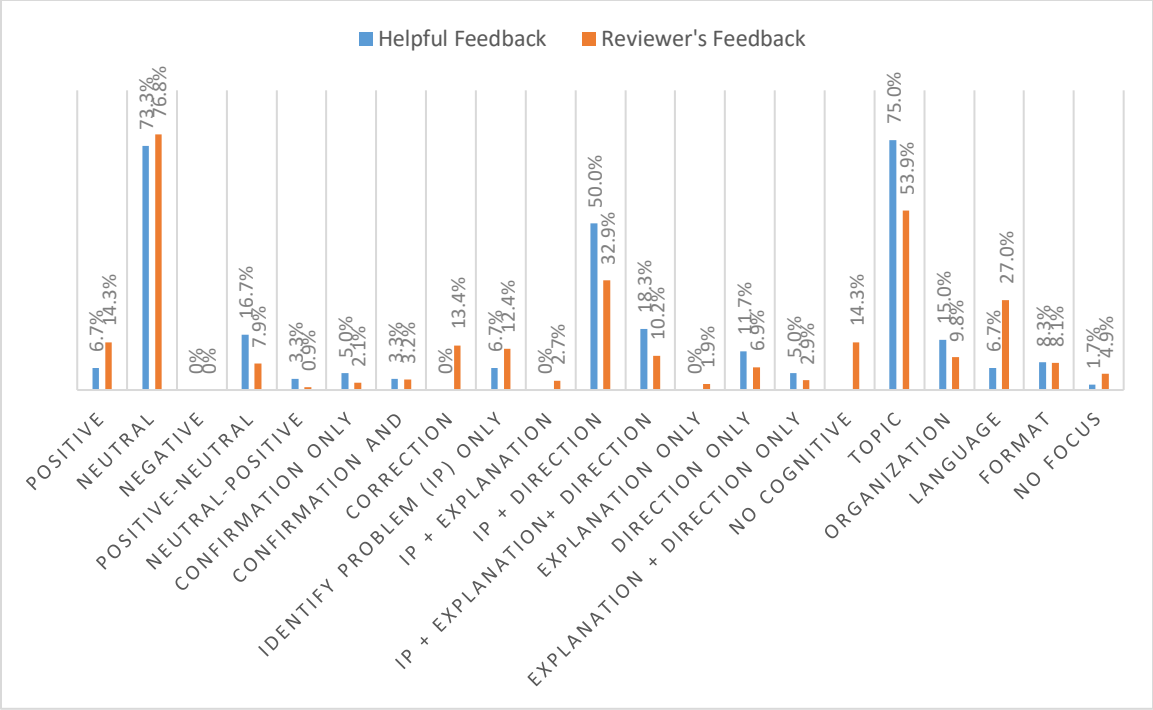


Figure 6.4 Comparison between Reviewers' Feedback and Helpful Feedback Nominated by Writers – Total

In this section, I examine the difference between the helpful feedback selected by the writers (preferred feedback) and the feedback constructed by the reviewers (provided feedback) and how that difference changed over time. If the reviewers checked the list of helpful feedback based on the *Helpful Feedback Survey* and assimilated it into their feedback construction, its influence would be reflected in their feedback construction for the next assignment. To put it another way, the reviewers' feedback construction in the second assignment would hopefully have been influenced by the helpful feedback list generated from the *Helpful Feedback Survey* based on the first assignment and, likewise, their feedback in the third assignment should have been influenced by the list based on the second assignment.

In terms of affective tone, Figure 6.5 indicates little or no apparent change over time between preferred feedback and provided feedback. Among the cognitive feedback categories (see Figure 6.6), there was no apparent mirroring of changes in preferred feedback by provided feedback, except for the Identify Problem + Direction feedback, which increased in both collections. A noticeable difference between preferred feedback and provided feedback was observed in the Correction feedback. No change was seen for Correction in preferred feedback, whereas the proportion in provided feedback

decreased. With respect to the Focus feedback (see Figure 6.7), changes in the constructed feedback seemed to mirror the changes in the helpful feedback in two categories, Topic and Language. The proportion of both constructed and helpful feedback relating to Topic increased over time, while Language decreased. Fluctuations in the other categories were minor and/or inconsistent.

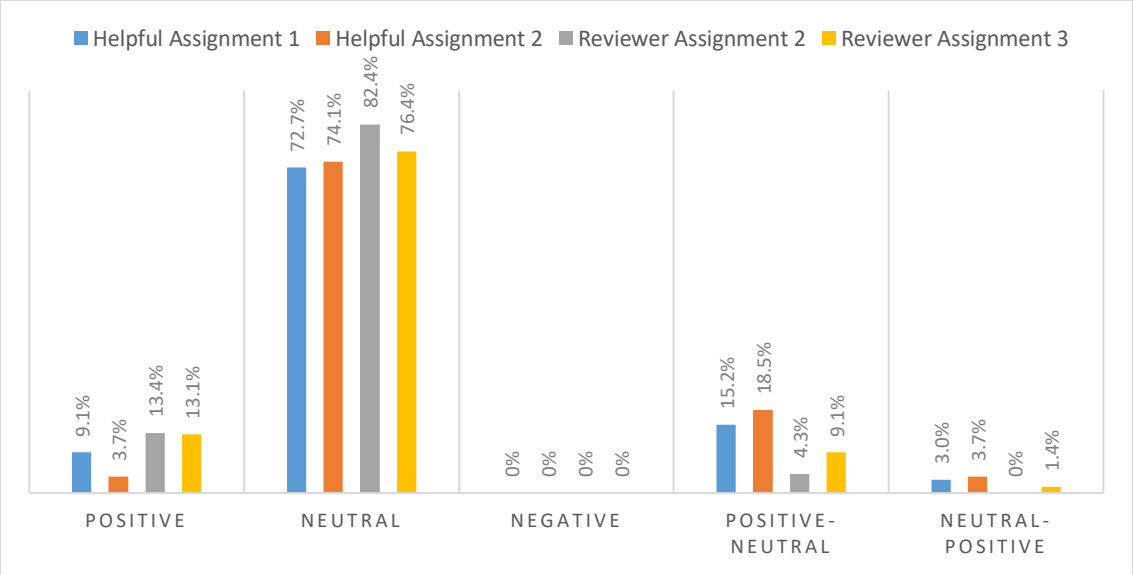


Figure 6.5 Comparison between Reviewers' Feedback and Helpful Feedback Nominated by Writers – Affective

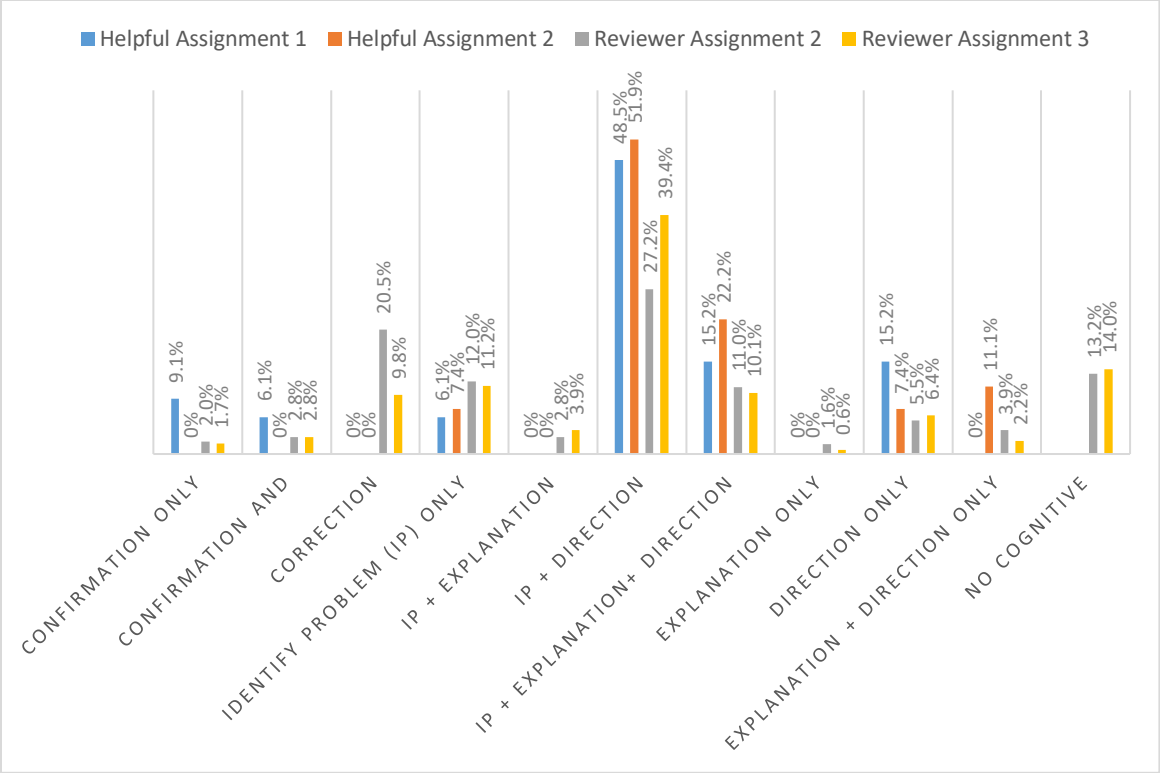


Figure 6.6 Comparison between Reviewers' Feedback and Helpful Feedback Nominated by Writers – Cognitive

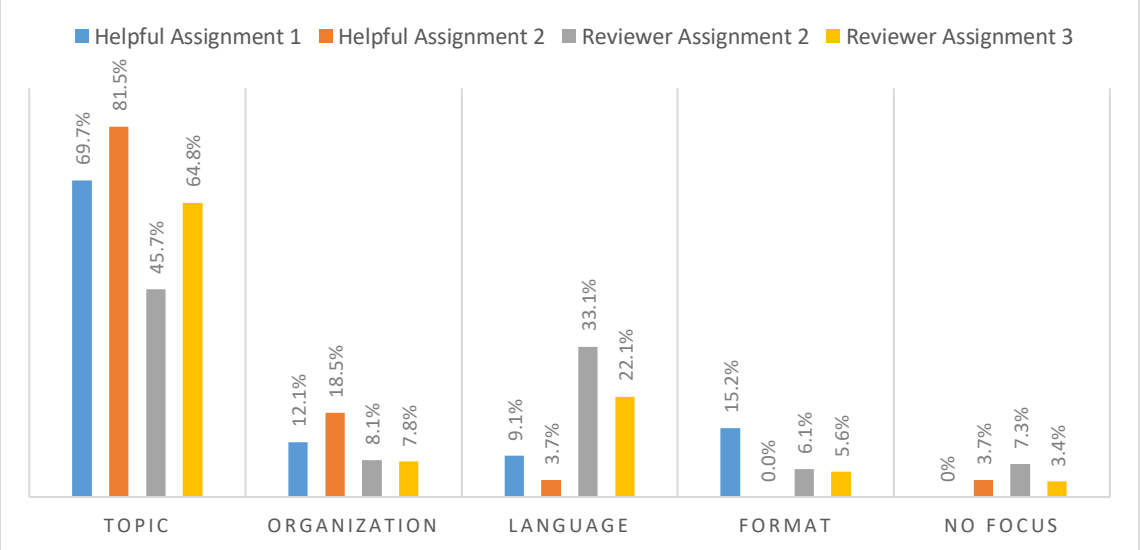


Figure 6.7 Comparison between Reviewers' Feedback and Helpful Feedback Nominated by Writers – Focus

6.1.3. Types of and Trends in Writer-Reviewer Interaction

The writer-reviewer interaction was examined to identify the types of and trends in reviewers' comment construction in the peer feedback process. Usually, a standard peer feedback process contains three steps: 1) writers write their first draft, 2) reviewers provide peer feedback, 3) writers revise the draft. In this process, communication is only one-way (from reviewers to writers). This research added another step: 1) writers write their first draft, 2) writers provide requests/concerns to reviewers, 3) reviewers provide peer feedback, 4) writers revise the draft. This allows students to engage in two-way communication (from writers to reviewers, and from reviewers to writers). Two analyses were conducted to understand if this additional step affected the reviewers' comment construction.

First, the relationship between the writers' comments and reviewers' responses from the writers' viewpoint was examined. This analysis examined whether writers received a response to their requests from reviewers. Table 6.7 summarizes the reviewers' responses to the writers' requests and whether feedback was constructed autonomously or driven by writers' requests. In all, 78% of the request comments from the writers received some sort of response from the reviewers across the three assignments. A chi-square goodness of fit test was used to determine if there were significantly more requests that received a response than those that received no response. (Of the three coding categories, "No need to get response" was excluded from the calculation.) The result indicated a significant difference, $X^2(1, N = 295) = 134.24$, $p < .001$, Cramer's $V = 0.65$. The effect size was large (Cohen, 1988), meaning requests were far more likely to receive a response than not receive a response. Interestingly, the proportion of writer questions that received a response decreased with each assignment (Assignment 1 = 91.8%, Assignment 2 = 80.8%, Assignment 3 = 62.9%). I should note that the writers included more non-answerable comments in the *Prior Question Tool* over every assignment (Assignment 1 = 4.1%, Assignment 2 = 7.7%, Assignment 3 = 9.5%).

Approximately 80% of feedback comments were autonomously constructed by the reviewers (independent comment) and approximately 20% of them were constructed to respond to the writers' questions or requests (reply comment). A chi-square test was conducted to determine if the number of autonomously constructed feedback comments

exceeded those that were replies. There was a significant difference, $X^2(1, N = 1208) = 382.78$, $p < .001$, Cramer's $V = 0.56$. Interestingly, the proportion of independent comments was slightly lower in the first assignment (72%) than the second and third assignments (81% in both).

Table 6.7 Frequency of Writer-Reviewer Interaction Type by Assignment

	Assignment 1	Assignment 2	Assignment 3	Total
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Writer	**98 (100)**	**104 (100)**	**116 (100)**	**318 (100)**
Got response	90 (91.8)	84 (80.8)	73 (62.9)	247 (77.7)
Did not get response	4 (4.1)	12 (11.5)	32 (27.6)	48 (15.1)
No need to get response	4 (4.1)	8 (7.7)	11 (9.5)	23 (7.2)
Reviewer	**364 (100)**	**493 (100)**	**351 (100)**	**1208 (100)**
Independent comment	261 (71.7)	399 (80.9)	284 (80.9)	944 (78.1)
Reply comment	103 (28.3)	94 (19.1)	67 (19.1)	264 (21.9)

6.1.4. Utilization of Prior Question Tool

The number of writers who used the *Prior Question Tool* is shown in Table 6.8. Approximately 70% of writers provided some requests and/or concerns in the first assignment (67.8%), 71% in the second assignment, and 68% in the third assignment. Surprisingly, less than half of writers did not fully utilize the tool. The average usage of the *Prior Question Tool* among reviewers was approximately 83%: 87% in Assignment 1; 77% in Assignment 2; 84% in Assignment 3 (see Table 6.9). Some reviewers directly changed the text of the writer's paper or used a comment box in the web-based LMS instead of using the tool. The number of reviewers who fully utilized the tool decreased from 65% in Assignment 1, to 58.1% in Assignment 2, but increased to 64.5% in Assignment 3. The number of reviewers who did not submit feedback comments was below 20%, but this was mostly due to their assigned writers missing the assignment or delaying their submission.

The data indicated that reviewers fully utilized the *Prior Question Tool* more than writers. There are a few possible explanations for this result. One of the possibilities is that reviewers were graded by their reviewing actions. Although the awarded points were few (2 points), this could act as a sufficient incentive for most reviewers. Moreover, the

non-anonymous setting of peer feedback in the current study could pressure reviewers to provide feedback to writers whom they knew they would meet in class. Another possibility is that the level of students' belief in the benefits of providing feedback request comments and peer feedback comments may differ between writers and reviewers. It is possible to infer that the concept of feedback provision by peers and its usefulness were accepted by students as a result of previous experience and the training session. On the other hand, the concept and advantage of writers providing feedback requests may not have been fully understood by writers, since this is a fairly unfamiliar activity and no detailed introduction was given during the peer feedback process.

Table 6.8 Frequency of Prior Question Tool Usage – Writers

	Assignment 1	Assignment 2	Assignment 3	Total
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Used "Overall" & "Specific" section	13 (41.9)	12 (38.7)	13 (41.9)	38 (40.9)
Used "Overall" section only	6 (19.4)	7 (22.6)	8 (25.8)	21 (22.6)
Used "Specific" section only	2 (6.5)	3 (9.7)	0	5 (5.4)
Did not provide request	10 (32.3)	9 (29.0)	9 (29.0)	28 (30.1)
No submission as a writer	0	0	1 (3.2)	1 (1.1)
Total	31 (100)	31 (100)	31 (100)	93 (100)

Table 6.9 Frequency of Prior Question Tool Usage – Reviewers

	Assignment 1	Assignment 2	Assignment 3	Total
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Used "Overall" & "Specific" section	20 (64.5)	18 (58.1)	20 (64.5)	58 (62.4)
Used "Overall" section only	2 (6.5)	1 (3.2)	3 (9.7)	6 (6.5)
Used "Specific" section only	5 (16.1)	5 (16.1)	3 (9.7)	13 (14.0)
Provided feedback but did not use template	3 (9.7)	1 (3.2)	0	4 (4.3)
No submission as a reviewer	1 (3.2)	6 (19.4)	5 (16.1)	12 (12.9)
Total	31 (100)	31 (100)	31 (100)	93 (100)

6.2. Student Perceptions of the Peer Feedback Experience

Students completed the *Peer Feedback Experience Questionnaire* that asked about the peer feedback process, and I conducted a descriptive quantitative analysis of the responses. The response scale ranged from 1 (strongly disagree) to 5 (strongly agree). The analysis captured students' perceptions of their peer feedback experience and the accompanying intervention process. The items were divided into categories that represented:

1. General attitude toward peer feedback (Table 6.10)
2. Attitudes toward the online implementation, tools, and received feedback (Table 6.11)
3. Other items (Table 6.12)

The items evaluating attitudes toward the peer feedback experience (Table 6.10, Table 6.11, and Table 6.12) all had a positive polarity, and therefore a mean calculated over each category could be meaningfully averaged without reverse scoring.

Table 6.10 General Attitude Toward the Peer Feedback Experience

Item #	Question	Mean	SD
General	Cronbach's Alpha = 0.834	**4.13**	**1.02**
1	The peer feedback is helpful to my learning.	4.27	0.92
2	The peer feedback makes me understand more about teacher's requirement.	4.35	0.89
3	The peer feedback activities can improve my skills in written communication.	4.08	1.09
4	The peer feedback activities help me understand what other classmates think.	4.46	0.71
5	The peer feedback activities motivate me to learn.	4.08	1.09
6	The peer feedback activities increase the interaction between my teacher and me.	3.92	1.26
7	The peer feedback helps me develop a sense of participation.	4.19	0.94
8	The peer feedback activities increase the interaction between my classmates and me.	4.08	1.09
11	I think the peer feedback is fair to assess students' performance.	3.77	1.21

Table 6.11 Attitudes Toward the Online Implementation, Tools, and Received Feedback

Item #	Question	Mean	SD
Online Implementation	Cronbach's Alpha = 0.801	**4.10**	**0.94**
16	Online peer review process can be timesaving.	3.92	1.06
17	Online peer review process can increase the positive interaction among classmates.	4.15	0.88
18	Online peer review process can be economical.	4.00	0.98
19	Online peer review system is a satisfactory system for uploading assignment.	3.96	1.11
20	Online peer review system is a satisfactory system for downloading assignment.	4.08	0.93
21	Online peer review system is a satisfactory system for giving feedback.	4.27	0.87
22	Online peer review system is a satisfactory system for receiving feedback.	4.35	0.75
Tools	Cronbach's Alpha = 0.795	**3.61**	**1.25**
23	The Assignment Paper Template helped to receive helpful feedback.	3.77	1.24
24	The Assignment Paper Template helped to provide helpful feedback.	3.62	1.33
26	The Helpful Feedback Comment List can be timesaving.	3.50	1.17
29	The Helpful Feedback Comment List is helpful to create feedback.	3.54	1.27
Received Feedback	Cronbach's Alpha = 0.828	**3.99**	**0.98**
27	The amount of the feedback I received from the peer reviewers is sufficient.	3.65	1.13
28	I understand easily the feedback I received from the peer reviewers.	4.35	0.63
34	Generally, the feedback that I received is fair.	4.04	0.96
37	I can learn from receiving feedback.	4.24	0.83
39	Generally, the feedback that I received is specific.	3.56	1.26
42	Generally, the feedback that I received is helpful.	4.12	1.05

Table 6.12 Other Attitudes Toward the Peer Feedback Experience

Item #	Question	Mean	SD
		3.26	**1.08**
9	I think students should not be responsible for giving feedback.	1.96	1.15
10	The teacher should develop criteria of the peer feedback activities for students.	4.31	0.97
12	Students should participate in the development of criteria for the peer feedback activities.	3.48	1.08
13	The peer feedback is time-consuming.	3.00	1.26
14	My feedback giving to classmates are affected by the feedback given to me.	3.15	1.59
15	If I receive feedback less helpful than I expected, then I will not try to provide helpful feedback to classmates.	1.85	1.08
25	I prefer to give feedback on specific paragraphs or sentences using the Tracking tool on MS-Word rather than giving summarized feedback at the end of the essay.	4.04	1.15
30	I received more helpful feedback in Assignment 2 than Assignment 1.	3.88	1.18
31	I received more helpful feedback in Assignment 3 than the Assignment 2.	3.65	1.23
32	Peers may not have adequate knowledge to provide feedback.	3.85	1.12
33	Peer feedback was often ambiguous or not relevant for further modification.	3.08	1.23
35	I can give understandable feedback.	4.19	0.69
36	Giving each other feedback is instructive.	4.08	1.08
38	For me, receiving feedback from peers is threatening.	1.40	0.50
40	I can learn from giving feedback.	4.28	0.84
41	Feedback should be given only by a teacher.	2.00	1.19

We will closely examine each category. The frequency and percentage of each answer's distribution are seen in Table 6.13, Table 6.14, Table 6.15, Table 6.16, and Table 6.17.

6.2.1. General

Overall, students regarded the peer feedback process quite positively. Over 70% of students felt that the peer feedback process was helpful for learning (Q1), understanding more about the assignment requirements (Q2), improving written communication skills (Q3), understanding what their classmates think (Q4), enhancing their motivation (Q5), increasing interaction with their instructor (Q6) increasing interaction with their classmates (Q8), and developing a sense of participation (Q7). Moreover, 73% agreed that the peer feedback process was a fair approach for assessing student performance (Q11).

Table 6.13 Perception of Peer Feedback Experience – General

Scale	1	2	3	4	5	Total
Q1: The peer feedback is helpful to my learning.						
Frequency	1		2	11	12	26
Percentage	3.8	0	7.7	42.3	46.2	100
Q2: The peer feedback makes me understand more about teacher's requirement.						
Frequency	0	2	1	9	14	26
Percentage	0	7.7	3.8	34.6	53.8	100
Q3: The peer feedback activities can improve my skills in written communication.						
Frequency	0	4	2	8	12	26
Percentage	0	15.4	7.7	30.8	46.2	100
Q4: The peer feedback activities help me understand what other classmates think.						
Frequency	0	0	3	8	15	26
Percentage	0	0.0	11.5	30.8	57.7	100
Q5: The peer feedback activities motivate me to learn.						
Frequency	1	2	2	10	11	26
Percentage	3.8	7.7	7.7	38.5	42.3	100
Q6: The peer feedback activities increase the interaction between my teacher and me.						
Frequency	0	7	0	7	12	26
Percentage	0	26.9	0	26.9	46.2	100
Q7: The peer feedback helps me develop a sense of participation.						
Frequency	0	2	3	9	12	26
Percentage	0	7.7	11.5	34.6	46.2	100
Q8: The peer feedback activities increase the interaction between my classmates and me.						
Frequency	1	1	5	7	12	26
Percentage	3.8	3.8	19.2	26.9	46.2	100
Q10: The teacher should develop criteria of the peer feedback activities for students.						
Frequency	0	2	3	6	15	26
Percentage	0.0	7.7	11.5	23.1	57.7	100
Q11: I think the peer feedback is fair to assess students' performance.						
Frequency	1	5	1	11	8	26
Percentage	3.8	19.2	3.8	42.3	30.8	100

Note. 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

6.2.2. Online Implementation

More than 80% of participating students strongly agreed or agreed that the online peer feedback process helped enhance positive interaction with their classmates (Q17) and was economical (Q18). Also, a majority were satisfied with the online system used in the current study, which includes uploading documents (Q19), downloading documents (Q20), giving feedback (Q21), and receiving feedback (Q22). Approximately

70% of students who responded to the questionnaire believed that the online process helped them save time (Q16).

Table 6.14 Perception of Peer Feedback Experience – Online Implementation

Scale	1	2	3	4	5	Total
Q16: Online peer review process can be timesaving.						
Frequency	0	4	3	10	9	26
Percentage	0	15.4	11.5	38.5	34.6	100
Q17: Online peer review process can increase the positive interaction among classmates.						
Frequency	0	2	2	12	10	26
Percentage	0	7.7	7.7	46.2	38.5	100
Q18: Online peer review process can be economical.						
Frequency	1	1	3	13	8	26
Percentage	3.8	3.8	11.5	50.0	30.8	100
Q19: Online peer review system is a satisfactory system for uploading assignment.						
Frequency	1	3	1	12	9	26
Percentage	3.8	11.5	3.8	46.2	34.6	100
Q20: Online peer review system is a satisfactory system for downloading assignment.						
Frequency	0	3	1	13	9	26
Percentage	0.0	11.5	3.8	50.0	34.6	100
Q21: Online peer review system is a satisfactory system for giving feedback.						
Frequency	0	2	1	11	12	26
Percentage	0.0	7.7	3.8	42.3	46.2	100
Q22: Online peer review system is a satisfactory system for receiving feedback.						
Frequency	0	1	1	12	12	26
Percentage	0.0	3.8	3.8	46.2	46.2	100

Note. 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

6.2.3. Tools

Students' attitudes toward the intervention tools were more often positive than negative; however, the means were lower than in other categories. In terms of the *Prior Question Tool*, a little over 70% of students felt that it was useful for receiving helpful feedback (Q23), but only 65% reported the template (the *Prior Question Tool*) was useful for constructing helpful feedback (Q24). Regarding the helpful feedback list, nearly 60% responded that it helped in constructing feedback (Q29) and saving time (Q26). Approximately 20% to 25% felt those tools were not helpful.

Table 6.15 Perception of Peer Feedback Experience – Tools

Scale	1	2	3	4	5	Total
Q23: The Assignment Paper Template helped to receive helpful feedback.						
Frequency	2	3	2	11	8	26
Percentage	7.7	11.5	7.7	42.3	30.8	100
Q24: The Assignment Paper Template helped to provide helpful feedback.						
Frequency	2	5	2	9	8	26
Percentage	7.7	19.2	7.7	34.6	30.8	100
Q26: The Helpful Feedback Comment List can be timesaving.						
Frequency	2	3	6	10	5	26
Percentage	7.7	11.5	23.1	38.5	19.2	100
Q29: The Helpful Feedback Comment List is helpful to create feedback.						
Frequency	3	2	5	10	6	26
Percentage	11.5	7.7	19.2	38.5	23.1	100

Note. 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

6.2.4. Received Feedback

Students also held positive perceptions of the feedback they received. Over 70% indicated that they, as writers, received sufficient feedback (Q27). Most of them strongly agreed or agreed that the feedback which they received was understandable (Q28), fair (Q34), specific (Q39), and helpful (Q42). Moreover, 84% of students answered that they learned from the received feedback (Q37).

Table 6.16 Perception of Peer Feedback Experience – Received Feedback

Scale	1	2	3	4	5	Total
Q27: The amount of the feedback I received from the peer reviewers is sufficient.						
Frequency	1	5	1	14	5	26
Percentage	3.8	19.2	3.8	53.8	19.2	100
Q28: I understand easily the feedback I received from the peer reviewers.						
Frequency	0	0	2	13	11	26
Percentage	0	0	7.7	50.0	42.3	100
Q34: Generally, the feedback that I received is fair.						
Frequency	1	1	2	14	8	26
Percentage	3.8	3.8	7.7	53.8	30.8	100
Q37: I can learn from receiving feedback.						
Frequency	0	1	3	10	11	25
Percentage	0	4.0	12.0	40.0	44.0	100
Q39: Generally, the feedback that I received is specific.						
Frequency	2	5	0	13	5	25
Percentage	8.0	20.0	0.0	52.0	20.0	100
Q42: Generally, the feedback that I received is helpful.						
Frequency	1	2	0	12	10	25
Percentage	4.0	8.0	0	48.0	40.0	100

Note. 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

6.2.5. Other

Sixteen questions about students' peer feedback experience were asked in this category. Some items in this category assess more complex beliefs about peer feedback, thus careful interpretation was required. The mean (*M* = 1.96, *SD* = 1.15) of Q9 ("I think students should not be responsible for giving feedback.") was relatively low. This implies that most students accepted their peers could potentially offer useful feedback. This was, however, tempered by a pragmatic understanding reflected in their response to Q32 ("Peers may not have adequate knowledge to provide feedback."), which had a relatively high mean (*M* = 3.85, *SD* = 1.12). The mean (*M* = 1.40, *SD* = 0.50) of Q38 ("For me, receiving feedback from peers is threatening.") was very low. In fact, the detailed distribution showed *Strongly disagree* = 60.0%, *Disagree* = 40.0%. This implies that all students who completed the questionnaire felt fairly comfortable receiving peer feedback, even though the procedure was not anonymous.

Q13 ("The peer feedback is time-consuming.") had *M* = 3.0, *SD* = 1.26 with the following distribution: *Strongly disagree* = 7.7%, *Disagree* = 42.3%, *Don't know* = 3.8%,

Agree = 34.6%, *Strongly agree* = 11.5%. This implies a split in students' beliefs about the time efficiency of the process. Q33 ("Peer feedback was often ambiguous or not relevant for further modification.") also split the respondents with *M* = 3.08, *SD* = 1.23, and a distribution in which *Strongly disagree* = 11.5%, *Disagree* = 26.9%, *Don't know* = 11.5%, *Agree* = 42.3%, *Strongly agree* = 7.7%. Half of the respondents perceived the peer feedback as often useless. There was a relatively low mean score (*M* = 2.00, *SD* = 1.19) for Q41 ("Feedback should be given only by a teacher."), and the distribution was *Strongly disagree* = 44.0%, *Disagree* = 32.0%, *Don't know* = 8.0%, *Agree* = 12.0%, *Strongly agree* = 4.0%. Very few students prefer feedback solely from a teacher, suggesting that, despite its imperfections, most saw peer feedback as offering value.

The data indicate a majority of students believed that their peers should be responsible for giving feedback (Q9), could give understandable feedback (Q35), could learn through the process of constructing feedback (Q40), and that the process of feedback construction helped knowledge building (Q36). Approximately half, however, expressed that their feedback construction would be affected by the quality of the feedback they received, and a similar number of students answered that it would not (Q14). Interestingly, many students reported they would give less helpful feedback if the feedback they received was not helpful (Q15). A majority of students had doubts about their peers' ability to construct feedback (Q32), and half felt the received feedback was often not clear or applicable for revisions (Q33). Despite these reservations, 76% thought that feedback did not have to be given only by instructors (Q41).

A relatively high proportion of students reported that they received more helpful feedback in the second assignment than the first one (Q30), and the trend continued when moving from the second assignment to the third (Q31). In terms of the peer feedback format, approximately 65% preferred providing feedback on specific texts or areas rather than overall feedback (Q25). Regarding the development of assessment criteria, a majority preferred to have instructors do it rather than students (Q10), but just over half wanted students to be involved in the development of peer feedback activities (Q12). Lastly, approximately half thought that the peer feedback process requires significant time and effort (Q13).

Table 6.17 Perception of Peer Feedback Experience – Other

Scale	1	2	3	4	5	Total
Q9: I think students should not be responsible for giving feedback.						
Frequency	11	10	1	3	1	26
Percentage	42.3	38.5	3.8	11.5	3.8	100
Q10: The teacher should develop criteria of the peer feedback activities for students.						
Frequency	0	2	3	6	15	26
Percentage	0.0	7.7	11.5	23.1	57.7	100
Q12: Students should participate in the development of criteria for the peer feedback activities.						
Frequency	1	4	6	10	4	25
Percentage	4.0	16.0	24.0	40.0	16.0	100
Q13: The peer feedback is time-consuming.						
Frequency	2	11	1	9	3	26
Percentage	7.7	42.3	3.8	34.6	11.5	100
Q14: My feedback giving to classmates are affected by the feedback given to me.						
Frequency	6	5	1	7	7	26
Percentage	23.1	19.2	3.8	26.9	26.9	100
Q15: If I receive feedback less helpful than I expected, then I will not try to provide helpful feedback to classmates.						
Frequency	12	10	1	2	1	26
Percentage	46.2	38.5	3.8	7.7	3.8	100
Q25: I prefer to give feedback on specific paragraphs or sentences using the Tracking tool on MS-Word rather than giving summarized feedback at the end of the essay.						
Frequency	1	1	7	4	13	26
Percentage	3.8	3.8	26.9	15.4	50.0	100
Q30: I received more helpful feedback in Assignment 2 than Assignment 1.						
Frequency	0	6	1	9	10	26
Percentage	0	23.1	3.8	34.6	38.5	100
Q31: I received more helpful feedback in Assignment 3 than the Assignment 2.						
Frequency	1	5	4	8	8	26
Percentage	3.8	19.2	15.4	30.8	30.8	100
Q32: Peers may not have adequate knowledge to provide feedback.						
Frequency	1	4	0	14	7	26
Percentage	3.8	15.4	0	53.8	26.9	100
Q33: Peer feedback was often ambiguous or not relevant for further modification.						
Frequency	3	7	3	11	2	26
Percentage	11.5	26.9	11.5	42.3	7.7	100
Q35: I can give understandable feedback.						
Frequency	0	0	4	13	9	26
Percentage	0	0	15.4	50.0	34.6	100

Scale	1	2	3	4	5	Total
Q36: Giving each other feedback is instructive.						
Frequency	1	2	1	11	10	25
Percentage	4.0	8.0	4.0	44.0	40.0	100
Q38: For me, receiving feedback from peers is threatening.						
Frequency	15	10	0	0	0	25
Percentage	60.0	40.0	0	0.0	0.0	100
Q40: I can learn from giving feedback.						
Frequency	0	1	3	9	12	25
Percentage	0	4.0	12.0	36.0	48.0	100
Q41: Feedback should be given only by a teacher.						
Frequency	11	8	2	3	1	25
Percentage	44.0	32.0	8.0	12.0	4.0	100

Note. 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

6.3. Case Studies

Three selected students' work on the second assignment was carefully analyzed in order to illustrate in a detailed way how students of diverse abilities engaged with their peer reviewers and revised their essays. For each case study, I present background information gathered from the questionnaires and the course instructor. As part of constructing each case, I compiled a detailed student profile and determined the number of changes made from the first draft to the final version.

Each comment unit provided in a draft was numbered starting from the first unit in the draft. In the quotations below, the unit number is indicated in parentheses.

6.3.1. Case 1: Writer A – Relatively Low Assignment Performance

As described in Chapter 4, in completing each analytical writing assignment, students were instructed to select three teaching approaches depicted in the videos provided by the instructor. The instructor referred to the selected teaching approaches as focus points for the assignment. Drawing from the theories and concepts studied in the course, each student was expected to provide description and analysis of their selected focus points and propose at least one alternative to one of the three teaching approaches (focus points). In her first draft, writer A used three teaching videos. Focus points 1 and 2 were two teaching approaches (verification and feedback) depicted in a math problem video. Focus point 3 was a teaching approach (self-explanation) depicted

in a science experiment video. Instead of framing her proposal as an alternative to one of the focus points, as the instructor likely intended, she instead proposed a teacher-centred approach as an alternative to the teaching depicted in a video from an English class. She used three sources from the assigned reading materials to write the essay.

As seen in Table 6.18, writer A did not show a pattern of consistently poor performance in the writing assignments. As scored by the course instructor, her performance in the first and third assignments was above the class median. The *Writing Self-Efficacy Questionnaire* showed that she had a moderate level of confidence in her writing compared to her classmates. She was highly motivated and reported using a variety of learning strategies quite well. The MSLQ indicated a high extrinsic goal orientation, and the AGQ indicated that she tends to compare her performance to that of her classmates. Moreover, her self-reported GPA ranked above the class median. Lastly, she did not have previous peer assessment experience.

The data from the *Peer Feedback Experience Questionnaire* (see Table 6.27, Table 6.28, and Table 6.29) indicated that writer A had a positive attitude toward the peer feedback process (M = 4.1) and the online format (M = 4.0). She saw the intervention tools (M = 3.3) and the received feedback (M = 3.7) as somewhat helpful. In terms of the quality of received feedback comments, she said she could not tell if they were ambiguous or not relevant. However, she agreed or strongly agreed with the positive statements of the items in the Received Feedback subcategory and strongly disagreed with the negative statements.

Writer A's peer review partner, reviewer A, would be considered a low performing student. All his assignment performance percentile ranks were below 15%. His self-reported GPA was also low relative to other classmates. His motivation level was fairly high, except on Task Value. He reported that his usage of learning strategies was high, but not as high as that of writer A. His AGQ scores showed that he ranked relatively high on Performance-avoidance, which means that he was concerned, possibly even anxious, about appearing to others as less competent. He had experienced peer assessment once before.

Table 6.18 Student Profile – Writer A and Reviewer A

	Writer A			Reviewer B		
	Percentile rank	Ranking	Raw score	Percentile rank	Ranking	Raw score
	%	(range)		%	(range)	
Assignment score						
Assignment 1	66.1	20.5 (1-31)	11.5	11.3	3.5	6.5
Assignment 2	35.5	11 (1-30.5)	14	3.2	1	8.25
Assignment 3	58.1	18 (1-30)	22.75	12.9	4	16.75
Total (Assignment 1+2+3)	59.7	18.5 (1-31)	48.25	3.2	1	31.5
SEWS						
Ideation	51.9	13.5 (1-26)	410	-	-	-
Conventions	48.1	12.5 (1-24)	460	-	-	-
self-regulation	55.8	14.5 (1-26)	450	-	-	-
Total	59.6	15.5 (1-26)	1320	-	-	-
WSES						
Writing task	44.2	11.5 (1-26)	1410	-	-	-
Writing skill	59.6	15.5 (1-26)	760	-	-	-
Total	61.5	16 (1-26)	2170	-	-	-
Motivated Strategies for Learning Questionnaire						
Motivation:						
Intrinsic Goal Orientation	76.8	21.5 (1-27.5)	24	98.2	27.5	26
Extrinsic Goal Orientation	89.7	26 (1-29)	25	70.7	20.5	23
Task Value	86.2	25 (1-25)	42	48.3	14	39
Control of Learning Beliefs	89.7	26 (1-29)	27	89.7	26	27
Self-Efficacy for Learning & Performance	81.0	23.5 (1-29)	50	100	29	54
Learning strategies:						
Critical Thinking	98.3	28.5 (1-28.5)	31	86.2	25	29
Metacognitive Self-Regulation	83.9	23.5 (1-28)	67	71.4	20	65
Effort Regulation	69.0	20 (2-28)	24	69	20	24
Achievement Goal Questionnaire						
Mastery-approach goal	79.3	23 (1-23)	15	48.3	14	14
Performance-approach goal	89.7	26 (1-26)	15	89.7	26	15
Performance-avoidance goal	67.2	19.5 (1.5-27.5)	13	94.8	27.5	15
Self-reported GPA	72.2	19.5 (2.5-26.5)	3.25 - 3.49	8.6	2.5	2.0 - 2.24
Gender	Female			Male		
1st language	English			English		
Peer assessment experience in the past (# of times)	No			Yes (1 time)		

6.3.1.1. Revision Behavior

The Compare Document tool showed that writer A made 95 changes from her first draft to her final version. The detailed revision actions are presented in Appendix H. Seven request units were identified from the writer's comments, and thirteen feedback units from the reviewers' comments. The distribution of each type of comment is presented in Table 6.19. Seven problematic areas were identified by reviewer A. Most of the cognitive feedback comments writer A received included direction (9), and nearly half of the feedback in the focus dimension was about language issues (5).

Table 6.19 Types of Request and Feedback Comment – Writer A and Reviewer A

Dimension	Writer A	Reviewer A	Use of feedback			
Category	# of comments	# of comments	Adopted	Not adopted	Undetermined	Other
Affective						
Positive	-	0				
Neutral	-	10				
Negative	-	0				
Positive- Neutral	-	2				
Neutral- Positive	-	0				
Total		*12*				
Cognitive						
Confirmation ONLY	-	1	1	0	0	0
Confirmation AND	-	2	0	0	2	0
Correction	-	1	1	0	0	0
Identify problem ONLY	-	1	1	0	0	0
+ Explanation	-	0	0	0	0	0
+ Direction	-	5	2	0	3	0
+ Explanation + Direction	-	1	0	0	1	0
Explanation ONLY	-	0	0	0	0	0
Direction ONLY	-	1	0	0	1	0
Explanation + Direction ONLY	-	2	0	0	2	0
Total		*14*	*5*	*0*	*9*	*0*
%			*35.7*	*0*	*64.3*	-
Focus						
Topic	4	2	0	0	2	0
Organization	0	0	0	0	0	0
Language	0	5	2	0	3	0
Format	1	2	2	0	0	0
No focus	2	4	1	0	2	1
Total	*7*	*13*	*5*	*0*	*7*	*1*
%			*41.7*	*0*	*58.3*	-

Note. The Other category accounts for feedback which the reviewer did not expect the writer to directly (e.g., "Good connection to theory!").

As shown in Table 6.20, writer A made not only minor changes but also several major changes between her draft and final versions. She made drastic changes particularly in the first and the third focus point sections, as well as in the proposal section. Some revision examples are given below. Codes assigned to the unit are indicated in angle brackets.

Table 6.20 Summary of Revision Change Level – Writer A and Reviewer A

Surface Changes	Frequency	%
Formal Changes	5	20
Meaning-Preserving Changes	7	28
Meaning Changes		
Microstructure Changes	5	20
Macrostructure Changes	8	32
Total	25	100

Example 1.1

Writer A made a Macrostructure Change in the analysis section of the first focus point in which she changed the theory she used to analyze the teaching approach.

Writer A's request comment (Unit #4):

I didn't talk about biases. Do you think it is important to include? I am at 1540 words so I had to make some cuts.

<Topic>

Writer A's 1st draft:

Analysis: According to Ellis, S., et al., (2014), data verification is one of the three functions of the learning procedure systematic reflection. This process […]

Reviewer A's feedback comment (Unit #3) – Not adopted:

[The instructor] will be very strict on word count this time around so I can understand where you are coming from I would suggest including a little bit about it.

<Neutral; Confirmation And; Explanation + Direction; Topic>

Writer A's final version (Macrostructure Change):

Analysis: According to Muis and Duffy (2013), epistemic growth occurs when the teacher models critical thinking of content, evaluation of multiple approaches to solving a problem and forming connections to prior knowledge. Based on this criteria, […]

Writer A shared two concerns with the reviewer A, one about word count and the other about missing content. Reviewer A confirmed that she needs to include the missing concept and suggested adding minimal coverage of it to avoid exceeding the word count. The reviewer also gave an explanation. In the final version, however, writer A changed the theory she used to analyze the chosen video. This entire analysis section, therefore, was completely re-written.

Example 1.2

One Microstructure Change was made in the proposal section, in which writer A was unsure whether she could use a video which she did not introduce in the focus points. She left a request comment to reviewer A.

> Writer A's request comment (Unit #6):
>
> I used a completely different video than what I used for my other 3 parts. Do you think that is bad?
>
> <Other>
>
> Writer A's 1st draft:
>
> 4) Proposal to enhance student learning
>
> What is the scenario? At the given moment of the video that I have chose to focus on, the teacher has asked a student to read both of the paragraphs on the power point slide. While doing so aloud, all the students have their own copy in front of them so that they can follow along.
>
> Reviewer A's feedback comment (Unit #9) - Undetermined:
>
> You can use different videos as [the instructor] mentioned, but double check with [the instructor] as I am not too sure about this one because this is your proposal section of the essay and it should relate to the video you used for your description and analysis.
>
> <Neutral; Confirmation And; Explanation + Direction; Other>

Reviewer A confirmed that writer A can use a different video for the proposal and provided a suggestion to ask the instructor. He also explained what he thinks about the choice the writer is facing.

Writer A's final version – Part A (Meaning-Preserving Change):

> Description: During the lesson, the teacher asks a student to read both of the paragraphs on the power point slide aloud. While he does so, his classmates have their own copy in front of them to follow.

In her final version, writer A ended up using the video which she introduced in the proposal section in the first draft. To do so, she gave up the third focus point in the first draft to replace the video description and analysis used in the proposal section. In the final version, she created a new section titled "*3) Teacher Directed Method of Instruction"* and moved some contents from the "*4) Proposal to enhance student learning"* section in the first draft to section 3. Part A in Example 1.2 was one of the contents moved from section 4 to section 3.

Writer A's final version – Part B (Microstructure Change):

> Proposal to Improve the Effectiveness of Point 3
>
> What it is: To enhance student learning in this given scenario, I recommend the teacher seeks out to develop a constructivist pedagogical approach.

As seen in the changes writer A made in Part B, she also modified the title of the proposal section in the final version from "*4) Proposal to enhance student learning"* to "*Proposal to Improve the Effectiveness of Point 3*." While sentence structures and content organization were modified, most of ideas and contents were kept from the first draft.

Example 1.3

This example shows writer A's revision actions related to the feedback comment which she nominated as helpful. She expressed on the *Helpful Feedback Survey* that the feedback she received from reviewer A was not helpful. She noted that most of the feedback comments were about language-related errors. Nonetheless, she nominated one feedback comment as helpful, which was a response to her request comment.

Writer A's request comment (Unit #5):

> I'm not sure if this is overall a good (the best possible) analysis? Or if I should just scratch it and write something else.

<Topic>

Writer A's 1st draft:

Analysis: According to Dunlosky et al., (2013), self-explanation is a teachers'/learners' practice that involves having students explain of their processing during learning for example through taking notes. The theory behind why this technique […]

Reviewer A's feedback comment nominated as a helpful comment by Writer A (Unit #6) – Not adopted:

Your sentence structure could be better I see a lot of small words in your paragraphs that don't necessarily need to be there. For example you can say that self explanation is a teachers'/learners' practice that involves having students explain their processing during learning through taking notes.

<Neutral; IP + Explanation + Direction; Language>

[Bold used to indicate helpful feedback comments which the writer nominated.]

Writer A was concerned about the content of her analysis section in the third focus point "*3) Using self explanation to improve comprehension"*. Reviewer A explained that she needs to fix the sentence structure but did not confirm that she should delete the section.

Writer A's final version (Macrostructure Change):

Analysis: According to Muis and Duffy (2013), a traditional learning environment (also known as a teacher centered approach) occurs when the teachers' method of instruction involves mostly lecturing and transmitting knowledge. In addition, research supports that this type of pedagogical […]

In the final version, writer A deleted the entire section to address the issue which was described in Example 1.2. As a matter of fact, her revision did not reflect reviewer A's feedback, even though writer A nominated this as the most helpful feedback, rather than other feedback which she actually made changes in response to. This may have affected how she perceived the helpfulness of reviewer A's feedback. Perhaps she felt that none of the feedback she received was helpful, and on top of that, she could not use the feedback she thought helpful for her revision.

As shown in Table 6.19, approximately 35% of the cognitive feedback given to writer A was adopted. However, for over 60% of the revision actions I was unable to determine whether the changes were made based on the reviewer's feedback, because the writer drastically changed the areas that the reviewer commented on. For instance, as seen in Example 1.2, this revision action *could* be taken to be based on the reviewer's feedback, but it could equally well be based on other factors. For example, writer A may have asked the instructor to put to rest her concerns, or perhaps she had already decided to use one of the theories from the focus points even before she received the peer feedback.

The trend of the focus feedback was similar to that of the cognitive feedback. Less than 40% of the focus feedback (which includes some language-related and format-related feedback) was adopted, but it was difficult to determine the source of most of the revision actions with confidence. One of the focus feedback comments was excluded from the adoption analysis ("I will leave a comment on your proposal below." <Neutral; Other>) since it was more of a notation.

6.3.2. Case 2: Writer B – Middling Assignment Performance

Writer B used three teaching videos to complete the second assignment. Focus point 1 was a teaching approach (imagery technique) shown in a video about sound. Focus point 2 was a teaching approach (hypercorrection) shown in a video about solving a math problem. Focus point 3 was a teaching approach (summarization) shown in a video about the butterfly life cycle. Unlike writer A, writer B presented a proposal that was an alternate teaching approach (self-explanation) to one of the focus points she had selected. Her essay cited two articles assigned as readings for the course.

As seen in Table 6.21, the second assignment score of writer B was in the middle percentile rage (Percentile rank = 54.8%). However, it should be noted that her score in the first assignment was below the 25th percentile rank and her score in the third assignment was over the 75th percentile. Her writing self-efficacy was low in general, except in the writing task subscale in the WSES. Her self-efficacy for successful learning and task performance, and her belief about her critical thinking ability were low, but the other MSLQ scores ranged from middle to high. Her AGQ and MSLQ scores indicate that she is more intrinsically motivated and focuses more on mastery of learning goals

than others, a motivational stance that is usually regarded as more beneficial than extrinsic motives and avoidance or performance goals. She had twice before taken a course which incorporated peer assessment.

As Table 6.27, Table 6.28, and Table 6.29 indicate, writer B had high regard for the online peer feedback process (*M* = 4.7) and the feedback she received (*M* = 4.4). Her attitudes toward the peer feedback process in general (*M* = 3.8) and the intervention tools (*M* = 3.5) were relatively high. She indicated strong agreement on all positive statements and strong disagreement on the negative statement in the Received Feedback subcategory. This indicates that she regarded the received feedback very positively.

Reviewer B might be considered to have lower ability to demonstrate knowledge of educational psychology in writing assignments because the percentile rank of her total assignment scores was low (Percentile rank = 36.26%). It was low in the first and second assignment and near the median in the third assignment. Nevertheless, she had high self-efficacy about her writing ability. The data from the MSLQ showed a high score on the Intrinsic Goal Orientation and the Task Value subscales (which means she valued the learning process and the activities assigned throughout the course). Consistent with that MSLQ result, her AGQ scores showed that she is most motivated toward mastery goals (i.e., learning for its own sake). Her reported GPA was in the middle range. She indicated that she had experienced peer assessment four times.

Table 6.21 Student Profile – Writer B and Reviewer B

	Writer B			Reviewer B		
	Percentile rank	Ranking	Raw score	Percentile rank	Ranking	Raw score
	%	(range)		%	(range)	
Assignment score						
Assignment 1	21	6.5 (1-31)	7.25	30.65	9.5	8.25
Assignment 2	54.8	17 (1-30.5)	16	20.97	6.5	13.25
Assignment 3	75.8	23.5 (1-30)	23.75	54.84	17	22.5
Total (Assignment 1+2+3)	54.8	17 (1-31)	47	36.26	10	44
SEWS						
Ideation	13.46	3.5 (1-26)	330	82.69	21.5	440
Conventions	23.08	6 (1-24)	380	76.92	20	490
self-regulation	11.54	3 (1-26)	270	92.31	24	570
Total	11.54	3 (1-26)	980	96.15	25	1500
WSES						
Writing task	80.77	21 (1-26)	1550	80.77	21	1550
Writing skill	25	6.5 (1-26)	600	92.31	24	790
Total	50	13 (1-26)	2150	84.62	22	23400
Motivated Strategies for Learning Questionnaire						
Motivation:						
Intrinsic Goal Orientation	48.2	13.5 (1-27.5)	21	89.3	25	25
Extrinsic Goal Orientation	44.8	13 (1-29)	19	20.7	6	17
Task Value	65.5	19 (1-25)	41	86.2	25	42
Control of Learning Beliefs	89.7	26 (1-29)	27	41.4	12	23
Self-Efficacy for Learning & Performance	17.2	5 (1-29)	41	25.9	7.5	43
Learning strategies:						
Critical Thinking	17.2	5 (1-28.5)	20	10.3	3	19
Metacognitive Self-Regulation	71.4	20 (1-28)	65	58.9	16.5	63
Effort Regulation	55.2	16 (2-28)	23	15.5	4.5	19
Achievement Goal Questionnaire						
Mastery-approach goal	34.5	10 (1-23)	13	79.3	23	15
Performance-approach goal	6.9	2 (1-26)	6	72.4	21	13
Performance-avoidance goal	13.8	4 (1.5-27.5)	6	51.7	15	12
Self-reported GPA (%)	Don't know	-	-	40.7	11	2.5-2.99
Gender	Female			Female		
1st language	English			English		
Peer assessment experience in the past (# of times)	Yes (2 times)			Yes (4 times)		

6.3.2.1. Revision Behavior

The Compare Document tool showed that writer B made a total of 80 changes between her draft and final submission. The number of the request units she provided was seven, and the feedback units from reviewer B was twenty-four. Appendix I shows the revision actions in detail. Table 6.22 indicates the distribution of each type of comment. Over half of the cognitive feedback, she received was problem-identification (13). Like writer A, writer B received mostly directive feedback (9). Over half of the feedback writer B received in the focus dimension was about the topic of the paper (15), and the remainder of the feedback was about language (9).

Table 6.23 shows that seven formal changes, five meaning-preserving changes, two microstructure changes, and twelve macrostructure changes were identified in my analysis. Most of the macrostructure changes were made because (as with the case of writer A) writer B drastically changed the first and the third focus points in her essay. She changed the teaching approach targeted in the selected video, the theory targeted in the first focus point, and the choice of video and theory in the third focus point.

Table 6.22 Types of Request and Feedback Comment – Writer B and Reviewer B

Dimension	Writer B	Reviewer B	Use of feedback			
Category	# of comments	# of comments	Adopted	Not adopted	Undetermined	Other
Affective						
Positive	-	5				
Neutral	-	17				
Negative	-	0				
Positive- Neutral	-	2				
Neutral- Positive	-	0				
Total		*24*				
Cognitive						
Confirmation ONLY	-	0	0	0	0	0
Confirmation AND	-	3	1	0	2	0
Correction	-	1	0	0	1	0
Identify Problem ONLY	-	6	4	0	2	0
+ Explanation	-	0	0	0	0	0
+ Direction	-	5	2	0	3	0
+ Explanation + Direction	-	2	0	0	2	0
Explanation ONLY	-	2	0	0	2	0
Direction ONLY	-	1	1	0	0	0
Explanation + Direction ONLY	-	1	1	0	0	0
Total		*21*	*9*	*0*	*11*	*0*
%			*45*	*0*	*55*	-
Focus						
Topic	3	15	3	0	6	6
Organization	0	0	0	0	0	0
Language	1	9	4	0	5	0
Format	0	0	0	0	0	0
No focus	0	0	0	0	0	0
Total	*4*	*24*	*7*	*0*	*11*	*6*
%			*38.9*	*0*	*61.1*	-

Note. The Other category accounts for feedback which the reviewer did not expect the writer to directly (e.g., "Good connection to theory!").

Table 6.23 Summary of Revision Change Level – Writer B and Reviewer B

Surface Changes	Frequency	%
Formal Changes	7	26.9
Meaning-Preserving Changes	5	19.2
Meaning Changes		
Microstructure Changes	2	7.7
Macrostructure Changes	12	46.2
Total	26	100

Example 2.1

Writer B shared her concern about her choice of theory in the first focus point section.

> Writer B's request comment (Unit #6):
>
> Do not know if this is the correct theory associated with the imagery technique.
>
> Writer B's 1st draft:
>
> The teacher is using an imagery technique during this focus of the instruction. The imagery technique is when individuals imagine the text that they are reading or listening to. The effect of the imagery technique is that it "can enhance one's mental organization or integration of information in the text, and idiosyncratic images of particular referents in the text could enhance learning as well (cf. distinctive processing; Hunt, 2006).
>
> Reviewer B's feedback comment (Unit #9) - Undetermined:
>
> Looks like the right theory to me, if you are unsure you could read through "6.1 General description of imagery use and why it should work" section of the article
>
> <Neutral; Confirmation And; Direction; Topic>

The reviewer confirmed that writer B's choice of the theory was correct. In addition to that, the reviewer refers to the section from the relevant article they covered in the course and made a suggestion to read it to double check.

> Writer B's final version (Macrostructure Change):

> The teacher is using cued recall in the focus of this lesson. Cued recall "generally [involves] the presentation of a fact to prompt recall of the entity for which the fact is true (Bjork, Dunlosky, and Kornell, 2013)." Cued recall is […]

Contrary to the reviewer's suggestion, writer B chose to use a different theory in her final submission. A similar pattern was observed in the third focus point section (see Example 2.2).

Example 2.2

> Writer B's request comment (Unit #7):
>
> Unsure if this is the theory behind summarization…
>
> Writer B's 1st draft:
>
> In this video, the teacher is using the summarization technique while learning the life cycle of a butterfly. Bretzing and Kulhavy's (1979) theory behind summarization is that "it can boost learning and retention because it involves attending to and extracting the higher-level meaning and gist of the material."
>
> Reviewer B's feedback comment (Unit #19) - Undetermined:
>
> I think that is the right theory, you found it under the "general description of summarization and why it should work" section like [the instructor] said right?
>
> <Neutral; Confirmation And; Explanation; Topic>
>
> Writer B's final version (Macrostructure Change):
>
> [The whole third focus point section was deleted. A new description and analysis were constructed.]

Again, writer B was uncertain if she chose the appropriate theory to support her analysis. She received confirmation that she was right with explanation from the reviewer. While the request comments and the feedback comments were provided for this section, these interactions between the writer and the reviewer did not evidently influence the writer's revision behavior.

With regard to other sections in which writer B did not make drastic revisions, she made minor changes based on the reviewer's feedback.

Example 2.3

Writer B's request comment (Unit #4):

Does this make sense or should I reword it?

Writer B's 1st draft:

The teacher draws a simple picture of the outer ear, ear canal, and inner drum on the board, but erases the drawing afterwards. The focus will be during the part where she is talking about the procedure of the experiment she wants the students to conduct.

Reviewer B's feedback comment (Unit #2) - Adopted:

I think that because the focus is on the procedure of the experiment, you don't need to mention the picture of the outer ear/ear canal/inner drum?

<*Neutral; Confirmation And; Explanation; Topic*>

Writer B's final version (Microstructure Change):

In this lesson, the students are conducting an experiment to figure out how sounds are heard.

Reviewer B's feedback comment (Unit #3) - Adopted:

When you say "the focus will be", do you mean that is the focus of the lesson or the focus of your analysis? its a little unclear

<Neutral; Identify Problem Only; Language>

Writer B's final version (Formal Change):

The focus of the lesson is when she is asking the class what an experiment consists of.

The reviewer responded to writer B's request comment and provided two specific comments. In the final version, writer B changed neither the video, teaching approach, nor supporting theory from the first draft of this section. As a result of not needing to make drastic changes to it, writer B revised the section based on the reviewer's feedback, which focused on only minor issues.

Writer B indicated in the *Helpful Feedback Survey* that the feedback she received was helpful. Two of reviewer B's feedback comments (Unit #10 in Example 2.4 and Unit #20 in Example 2.5) were selected as helpful feedback by writer B.

Example 2.4

Writer B's request comment:

[The request comment was not provided.]

Writer B's 1st draft:

When the teacher realized that she did not have the picture of the outer ear on the board, she asked the students to imagine the drawing. By doing this, she is encouraging the students to create the picture in their minds, which can help the students develop and remember the parts of the outer ear.

Reviewer B's feedback comment nominated as a helpful comment by Writer B (Unit #10) - Undetermined:

Okay, I see now how the image of the drawing is relevant, Good Connection to theory! Maybe try to tie it into the focus of your description, which seemed to be the procedure

<*Positive-Neutral; Identify Problem And; Explanation +Direction; Topic*>

[Bold used to indicate helpful feedback comments which the writer nominated.]

Writer B's final version (Macrostructure Change):

[The whole first focus point section was reconstructed and made a new description and analysis.]

Example 2.5

Writer B's request comment:

[The request comment was not provided.]

Writer B's 1st draft:

By organizing the four stages on the paper plate, it can help the students identify the main ideas and enhance summarization strategies.

Reviewer B's feedback comment nominated as a helpful comment by Writer B (Unit #20) - Undetermined:

Good connection!

I think this quote might be helpful to strengthen this argument; summarization should also boost organizational processing, given that extracting the gist of a text requires learners to connect disparate pieces of the text, as opposed to simply evaluating its individual components - found towards the end of summarization section (3.1)

<*Positive-Neutral; Identify Problem And; Direction; Topic*>

[Bold used to indicate helpful feedback comments which the writer nominated.]

Writer B's final version (Macrostructure Change):

[The whole third focus point section was deleted. A new description and analysis were constructed.]

In contrast to writer A, writer B selected the feedback comments which were constructed on the reviewer's own initiative rather than the response feedback. Both feedback comments were about the topic and included direction. Interestingly, writer B's revision actions based on the selected feedback comments were not clearly identifiable, since writer B reconstructed the sections for which the reviewer suggested to use different video scenes and theories. However, the nomination of these comments as helpful could be interpreted as meaning they were adopted in her revision. Also, it could be said that the feedback in Example 2.5 assisted the writer's decision making about choosing a new video and theory with confidence.

Turning now to writer B's adoption of the peer feedback (see Table 6.22), she adopted 45% of the cognitive feedback. However, over half of the writer's revision actions could not be clearly attributed to a source. As with the previous case (writer A), writer B drastically changed the first and third focus sections (see Examples 2.1, 2.2, 2.4, and 2.5). Again, as in the previous case, it is difficult to conclude whether the revisions were made based on the reviewer's feedback or other factors. Moreover, six feedback comments were not intended to prompt revisions (e.g., Unit #1: "You've made some great connections in your paper!" <Positive; Topic>, Unit #23: "Good connection to theory!" <Positive; Topic>). These feedback comments were not included the revision

adoption count. In terms of the focus feedback comments, only approximately 30% were adopted, while it was unclear whether the remainder were.

6.3.3. Case 3: Writer C – High Assignment Performance

Writer C used only one video (animal adaptation) to complete the assignment. It was a lengthy video showing a single lesson which featured a variety of teaching approaches. The three focus points she selected were self-explanation, peculiarities of human memory, and hypercorrection effect. She proposed adopting metacognition to improve the lesson. Her essay cited three articles assigned as reading materials.

As can be seen in Table 6.24, writer C performed well in all three assignments and her cumulative GPA was well above average. However, her self-reported writing self-efficacy was low except on the self-regulation subscale of the SEWS. Also, according to the MSLQ and AGQ, her self-reported motivations were marked by high levels of performance avoidance, which suggests performance anxiety and a fear of failure. The learning strategy subscales of the MSLQ also indicated low levels of self-reported critical thinking, metacognitive self-regulation, and effort regulation. She had one previous experience with peer assessment.

The questionnaire results in Table 6.27, Table 6.28, and Table 6.29 indicate that writer C had a positive attitude toward the online peer feedback process (M = 4.0). Her perceptions about the peer feedback process in general (M = 3.6) and the received feedback (M = 3.6) were relatively positive. However, she had a negative perception about the intervention tools (M = 2.0). While the mean of the Received Feedback subcategory was not as high as the Online Implementation subcategory, the data in the Received Feedback subcategory indicates that she agreed with all positive statements about the received feedback and strongly disagreed with the negative statements.

Reviewer C received middle to high scores in the three assignments. However, she ranked below the middle of her class on cumulative GPA. Unlike writer C, compared to her classmates, reviewer C's writing self-efficacy ranged from middle to high, except on the writing task subscale in the WSES, which was quite low. Her learning motivation was relatively low, except she had moderate intrinsic motivation. She reported an average level of critical thinking, but low levels of metacognitive self-regulation and effort

regulation. Reviewer C ranks at the middle of the class in performance avoidance goals, suggesting less performance anxiety than writer C. Reviewer C experienced peer assessment twice previously.

Table 6.24 Student Profile – Writer C and Reviewer C

	Writer C			Reviewer C		
	Percentile rank	Ranking	Raw score	Percentile rank	Ranking	Raw score
	%	(range)		%	(range)	
Assignment score						
Assignment 1	96.8	30 (1-31)	14	90.3	28	13.75
Assignment 2	93.5	29 (1-30.5)	19.3	74.2	23	17.75
Assignment 3	82.3	25.5 (1-30)	24.3	64.5	20	23
Total (Assignment 1+2+3)	93.5	29 (1-31)	57.5	80.6	25	54.5
SEWS						
Ideation	7.7	2 (1-26)	290	92.3	24	450
Conventions	3.8	1 (1-24)	260	69.2	18	485
self-regulation	86.5	22.5 (1-26)	540	71.2	18.5	470
Total	19.2	5 (1-26)	1090	73.1	19	1405
WSES						
Writing task	15.4	4 (1-26)	1120	11.5	3	1100
Writing skill	7.7	2 (1-26)	430	67.3	17.5	770
Total	7.7	2 (1-26)	1550	30.8	8	1870
Motivated Strategies for Learning Questionnaire						
Motivation:						
Intrinsic Goal Orientation	3.6	1 (1-27.5)	15	62.5	17.5	22
Extrinsic Goal Orientation	3.4	1 (1-29)	14	6.9	2	15
Task Value	37.9	11 (1-25)	38	25.9	7.5	36
Control of Learning Beliefs	20.7	6 (1-29)	21	10.3	3	20
Self-Efficacy for Learning & Performance	6.9	2 (1-29)	35	13.8	4	37
Learning strategies:						
Critical Thinking	27.6	8 (1-28.5)	21	56.9	16.5	25
Metacognitive Self-Regulation	3.6	1 (1-28)	47	7.1	2	50
Effort Regulation	24.1	7 (2-28)	20	24.1	7	20
Achievement Goal Questionnaire						
Mastery-approach goal	34.5	10 (1-23)	13	10.3	3	11
Performance-approach goal	56.9	16.5 (1-26)	12	20.7	6	9
Performance-avoidance goal	94.8	27.5 (1.5-27.5)	15	51.7	15	12
Self-reported GPA (%)	72.2	19.5 (2.5-26.5)	3.25-3.49	40.7	11	2.5-2.99
Gender	Female			Female		
1st language	English			English		
Peer assessment experience in the past (# of times)	Yes (1 time)			Yes (2 times)		

6.3.3.1. Revision Behavior

The number of changes visible with the Compare Document tool was 81. The detailed revision actions can be seen in Appendix J. Six units from the writer's comments and fifteen units from the reviewer's comments were identified. Table 6.25 indicates that all of writer C's request were about the topic (content and/or subject) of her paper, while the writers in the two previous cases also included concerns about the format or language. Like the other two cases, writer C received primarily directive (6) and topic-related feedback (9). Unlike the other participants, she did not receive as much feedback identifying problems (5). Table 6.26 presents the types of revisions writer C made. Although microstructure and macrostructure changes were identified in many areas in the papers of the previous two cases and each change covered an extensive area, writer C made somewhat fewer changes of this type, and each change tended to involve fewer words.

Table 6.25 Types of Request and Feedback Comment – Writer C and Reviewer C

Dimension	Writer C	Reviewer C	Use of feedback			
Category	# of comments	# of comments	Adopted	Not adopted	Undetermined	Other
Affective						
Positive	-	3				
Neutral	-	11				
Negative	-	0				
Positive- Neutral	-	1				
Neutral- Positive	-	0				
Total		*15*				
Cognitive						
Confirmation ONLY	-	1	1	0	0	0
Confirmation AND	-	1	1	0	0	0
Correction	-	1	1	0	0	0
Identify Problem ONLY	-	1	1	0	0	0
+ Explanation	-	0	0	0	0	0
+ Direction	-	1	1	0	0	0
+ Explanation + Direction	-	3	2	1	0	0
Explanation ONLY	-	2	1	1	0	0
Direction ONLY	-	2	1	0	0	1
Explanation + Direction ONLY	-	0	0	0	0	0
Total		*12*	*8*	*2*	*0*	*1*
%			*81.8*	*18.2*	*0*	*-*
Focus						
Topic	6	9	5	1	0	3
Organization	0	1	1	0	0	0
Language	0	3	2	1	0	0
Format	0	0	0	0	0	0
No focus	0	2	0	0	0	2
Total	*6*	*15*	*8*	*2*	*0*	*5*
%			*80*	*20*	*0*	*-*

Note. The Other category accounts for feedback which the reviewer did not expect the writer to directly (e.g., "Good connection to theory!").

Table 6.26 Summary of Revision Change Level – Writer C and Reviewer C

Surface Changes	Frequency	%
Formal Changes	5	20
Meaning-Preserving Changes	9	36
Meaning Changes		
Microstructure Changes	5	20
Macrostructure Changes	6	24
Total	25	100

Example 3.1

[No request comment was provided by writer C]

[No feedback comment was provided by reviewer C]

Writer C's 1st draft:

> The teacher summarizes what he says by stating the skinny objects were not as easy to pick up as the larger objects. The teacher asks other students to share their experiences they felt during the activity. Another student explains a very similar experience with the crumpled paper being easier to grab using the oven mittens.

Writer C's Final version (Macrostructure Change):

> The teacher asked a couple other students to share their experiences from the activity. Next, she started a long question based discussion to get the students connecting the activity to real life examples and thinking about different shapes and sizes of beaks and their corresponding food types.

Unlike the writers discussed in the previous two cases, writer C did not make major changes. In part this is due to the fact she used the same videos and theories from the first draft to the final version, and only added an additional scene in the first focus point.

One major macrostructure change was identified in the section below.

Example 3.2

Writer C's request comment (Unit #3):

> Is systematic reflection the theory? Or am I able to just argue one of three of its components which is self-explanation? I got the impression from [the instructor's] email that is was self-explanation in the Dunlosky article that was not a theory but a technique...

Writer C's 1st draft:

> The teacher was promoting self-explanation in order to strengthen the student's understandings of how their actions resulted in certain outcomes. Self-explanation, part of systematic reflection, is when students actively analyze their behaviours in order to understand reasons for their success or failure (Ellis, Carette, Anseel & Lievens, 2014). The teacher made her students aware, prior to the activity, that they should be considering what it was like to be a bird and have a beak.

Writer C used one of the components of systematic reflection for the theoretical analysis. However, she expressed in her request comment that she was unsure if she could treat self-explanation as a theory.

Reviewer C's feedback comment (Unit #7) - Adopted:

> I used systematic reflection in my paper too but I was also confused with [the instructor's] email regarding that article… I think it would be safest to focus more on systematic reflection as a whole to fulfill the theory criteria but then go into detail about how self-explanation is a function of systematic reflection and how it was used in this video.

<Neutral; Direction; Topic>

The reviewer responded to writer C's concerns and shared that she was also uncertain whether systematic reflection is considered a theory or a technique. Thus, she suggested a possible solution.

Writer C's final version (Macrostructure Change):

> The teacher was promoting systematic reflection. Systematic reflection is a learning procedure in which students analyze their behaviour and connect it to their performance outcomes (Ellis, Carette, Anseel & Lievens, 2014). Systematic reflection contains three functions […]. Self-explanation, when students actively analyze their behaviours in order to understand reasons for their success or failure (Ellis et al., 2014), was demonstrated when the teacher made her students aware, prior to the activity, that they should consider what it was like to be a bird and have a beak.

In the final version, it seemed that writer C understood systematic reflection to be a theory. Then, in accordance with the reviewer's feedback, writer C revised the section by treating self-explanation as a part of systemic reflection.

In terms of the helpfulness of the received feedback, writer C selected one feedback comment as helpful.

Example 3.3

[No request comment was provided by writer C]

Writer C's 1st draft:

Analysis: The discussion brought about an opportunity for students to […]. Butterfield and Metcalfe (2001) label this the hypercorrection effect, where students who make errors with a high level of confidence actually enhance their learning opportunity (cited in Bjork, Dunlosky & Kornell, 2013). In the scenario above, the teacher called upon one particular student who believed his answer was going to be absolutely correct. When the bird he said was not at all what the teacher was thinking about or describing, a […]. The teacher provided many clues and hints as to what type of bird she was thinking about. The student was able to listen to his […].

In the end of the above scenario, there was a loud response from the class that […]

While the majority of the class did not make blatant guessing errors, the environment provided students with examples of incorrect answers that they could then learn from. […]

The student that provided a blatantly incorrect answer was most vulnerable to a learning opportunity. The environment the teacher created allowed for students to learn from other's mistakes, some characteristics of the hummingbird.

Reviewer C's feedback comment, nominated as a helpful comment by Writer C (Unit #12) - Adopted:

I think the analysis about the theory starts to get a little off track towards the end when the environmental and teacher's cues come in. The hypercorrection effect makes the student who was corrected of his high-confidence error more likely to remember the correction. So I think you can add something about how that specific student who made the initial error will encode the correction more deeply than other students (because of the effect) and take out the parts about the teacher giving clues.

<Neutral; Identify Problem AND; Explanation+Direction; Topic>

[Bold used to indicate helpful feedback comments which the writer nominated.]

The reviewer commented on the whole analysis section. She provided a plausible definition of the hypercorrection effect to alert the writer regarding her possible misunderstanding of the theory. The reviewer also suggested deleting one section because it was not accurate.

Writer C's final version (Microstructure Change; Formal Change; Macrostructure Change):

> Analysis: The discussion brought about an opportunity for students to […]. Butterfield and Metcalfe (2001) label this the hypercorrection effect, where students who make errors with a high level of confidence actually enhance their learning opportunity (cited in Bjork, Dunlosky & Kornell, 2013). In the scenario above, the teacher called upon one particular student who believed his answer was going to be absolutely correct. When the bird he said was not at all what the teacher was thinking about or describing, a […].
>
> [Deleted]
>
> At the end of the above scenario, there was a loud response from the class that […]
>
> [Deleted]
>
> The student that provided a blatantly incorrect answer was most susceptible to a learning opportunity and learned that the hummingbird was connected to the characteristics the teacher described.

In the final version, writer C deleted the problematic section and revised other areas to appropriately address the theory.

With regard to writer C's use of the received feedback in her revision (see Table 6.25), unlike writer A and writer B, 80% of the cognitive feedback comments were adopted. There were no undetermined revision actions. Only two feedback comments were not adopted. These were Unit #9: "One thing to consider is using the words "to which" 1 or 2 less times, especially since they appeared 3 times in a row." <Neutral; Identify Problem AND; Explanation + Direction; Language>, and Unit #11: "Hmm, this one is debatable whether it's a theory or not. I don't really think it is. From my understanding, this analysis is about making students cognitively engage in the material

they're learning by connecting it with knowledge they already have. This can be turned into a theory about elaboration." <Neutral; Explanation; Topic>.

The Focus feedback followed a similar pattern to the cognitive feedback. Only one Topic and one Language feedback comment were not adopted. There were five feedback comments that did not call for revisions. Three examples from these are:

- Unit #1: "I'm slightly relieved to know that I wasn't the only one who found it hard to identify theories for this assignment. It definitely was way more confusing than last time." <Neutral; Other>
- Unit #15: "This is a great proposal." <Positive; Other>
- Unit #2: "There's a little bit of uncertainty regarding the theory in your second observation which I addressed in comments below. If you want you can consult [the instructor] on what theories are acceptable to use before handing in your final copy." <Neutral; Direction; Topic>)

6.3.4. Peer Feedback Experience among Case Study Participants

In the responses of the three writers to the *Peer Feedback Experience Questionnaire*, only a few items (18, 24, 29, 14, 32) showed variation of at least three levels. The items are shaded in grey in Table 6.28 and 6.29. In terms of the General category (see Table 6.27), all case study participants perceived the peer feedback experience positively. They thought peer feedback was helpful for their learning, their understanding of assignment requirements and other classmates' thoughts, their improvement of their written communication skills, and increasing their interaction with their teacher. They somewhat agreed with or were neutral on the idea that the peer feedback activities motivated them to learn. There was a similar lukewarm response to the idea that peer feedback is a fair way to assess students.

Table 6.27 Perception of Peer Feedback Experience – Writers in Case studies

Item #	Question	Writer A	Writer B	Writer C
General				
1	The peer feedback is helpful to my learning.	4	5	4
2	The peer feedback makes me understand more about teacher's requirement.	4	5	4
3	The peer feedback activities can improve my skills in written communication.	4	4	4
4	The peer feedback activities help me understand what other classmates think.	4	5	5
5	The peer feedback activities motivate me to learn.	4	3	4
6	The peer feedback activities increase the interaction between my teacher and me.	5	5	4
7	The peer feedback helps me develop a sense of participation.	5	4	4
8	The peer feedback activities increase the interaction between my classmates and me.	5	5	4
11	I think the peer feedback is fair to assess students' performance.	4	3	4
Mean		4.2	3.9	3.7

Note. 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

For the items in the Online Implementation category (see Table 6.28), the case study participants were satisfied with the way that peer feedback was implemented technically, except that writer C felt it was time-consuming and inefficient. Regarding the intervention tools (see Table 6.28), the case study participants perceived the *Prior Question Tool* was valuable for them as writers to receive helpful feedback. However, writer A and writer C did not think that the tool was useful for them as reviewers to generate helpful feedback. The Helpful Feedback Comment List apparently helped writer A to generate helpful feedback, but the other two participants believed the opposite. Writer C did not consider the list to be time saving, while the other two were neutral.

The results of the Received Feedback category in Table 6.28 indicated that the case study participants were satisfied with feedback from peers. They either strongly agreed or agreed that peer feedback was fair, specific, helpful, easy to understand, and helpful for their learning. They also thought that they received a sufficient amount of feedback from peers.

Table 6.28 Attitudes Toward the Online Implementation, Tools, and Received Feedback – Writers in Case studies

Item #	Question	Writer A	Writer B	Writer C
Online Implementation				
16	Online peer review process can be timesaving.	4	4	2
17	Online peer review process can increase the positive interaction among classmates.	4	4	5
18	Online peer review process can be economical.	4	5	1
19	Online peer review system is a satisfactory system for uploading assignment.	4	5	5
20	Online peer review system is a satisfactory system for downloading assignment.	4	5	5
21	Online peer review system is a satisfactory system for giving feedback.	4	5	5
22	Online peer review system is a satisfactory system for receiving feedback.	4	5	5
Mean		4.0	4.7	4.0
Tools				
23	The Assignment Paper Template helped to receive helpful feedback.	4	5	4
24	The Assignment Paper Template helped to provide helpful feedback.	2	5	2
26	The Helpful Feedback Comment List can be timesaving.	3	3	1
29	The Helpful Feedback Comment List is helpful to create feedback.	4	1	1
Mean		3.3	3.5	2.0
Received Feedback				
27	The amount of the feedback I received from the peer reviewers is sufficient.	4	5	4
28	I understand easily the feedback I received from the peer reviewers.	4	5	4
34	Generally, the feedback that I received is fair.	4	5	4
37	I can learn from receiving feedback.	5	5	4
39	Generally, the feedback that I received is specific.	4	5	4
42	Generally, the feedback that I received is helpful.	4	5	4
Mean		4.2	5.0	4.0

N*ot.*: 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

In the Other category (see Table 6.29), the responses showed some variation. Writer B responded that the peer feedback which she received in Assignment 2 was more helpful than that in Assignment 1, but peer feedback from Assignment 3 was less helpful than from Assignment 2. Writer A strongly agreed that peer feedback in Assignment 3 was more helpful than Assignment 2 and peer feedback in Assignment 2

was more helpful than Assignment 1. On the other hand, writer C was uncertain about the helpfulness of peer feedback in each assignment.

While writer B thought that peers had adequate knowledge to function as reviewers, writers A and C thought they might not. However, writer B strongly disagreed that peer feedback was an instructive approach, whereas the other two thought it was. Writer B reported that her production of feedback was affected by peer feedback which she received, but she also said that she would try to provide helpful feedback even though she received less helpful peer feedback. Writer C reported that her production of feedback would not be affected by the quality of received feedback and she would make an effort to provide helpful feedback even if she received less helpful peer feedback. Writer A did not think the production of her feedback will be affected by the quality of received feedback, but she was not sure if she still could try to provide helpful feedback after she received less helpful peer feedback. All three case study participants thought that peer feedback was usually unambiguous and relevant to the revision process.

Table 6.29 Other Attitudes Toward the Peer Feedback Experience – Writers in Case studies

Item #	Question	Writer A	Writer B	Writer C
Other				
9	I think students should not be responsible for giving feedback.	1	1	1
10	The teacher should develop criteria of the peer feedback activities for students.	5	5	4
12	Students should participate in the development of criteria for the peer feedback activities.	5	3	4
13	The peer feedback is time-consuming.	2	2	2
14	My feedback giving to classmates are affected by the feedback given to me.	2	5	1
15	If I receive feedback less helpful than I expected, then I will not try to provide helpful feedback to classmates.	3	1	1
25	I prefer to give feedback on specific paragraphs or sentences using the Tracking tool on MS-Word rather than giving summarized feedback at the end of the essay.	5	5	4
30	I received more helpful feedback in Assignment 2 than Assignment 1.	5	5	3
31	I received more helpful feedback in Assignment 3 than Assignment 2.	5	2	3
32	Peers may not have adequate knowledge to provide feedback.	5	2	5
33	Peer feedback was often ambiguous or not relevant for further modification.	3	1	2
35	I can give understandable feedback.	4	5	5
36	Giving each other feedback is instructive.	5	1	4
38	For me, receiving feedback from peers is threatening.	1	1	1
40	I can learn from giving feedback.	5	5	4
41	Feedback should be given only by a teacher.	3	1	1

Note. 1=*Strongly disagree*; 2=*Disagree*; 3=*Don't know*; 4=*Agree*; 5=*Strongly agree*

In summary, the data from the questionnaire indicated that three case study participants had similar perceptions about peer feedback experience. They positively perceived peer feedback experience in general. In terms of the received peer feedback, they reported positive perceptions. However, Writer B thought peers may not have adequate knowledge to provide feedback. Also, only Writer B did not think that the peer feedback activity was instructive. Only a few differences were observed as a reviewer. The intervention tools were not helpful for Writer C. For Writer A, the *Helpful Feedback Comment List* was helpful but the *Prior Question Tool* was not. In contrast, for Writer B, the *Prior Question Tool* was helpful but the comment list was not.

6.3.5. General Observations about the Case Study

The case study analysis revealed some salient similarities and differences in the peer feedback experience and revision actions among three writers in the case study. Regarding the similarities, all three participants primarily received feedback that was directive and addressed topic-related issues. During the revision process, each of the three cases ranged fully over the coded types of changes (formal, meaning-preserving, microstructure, and macrostructure changed). The case study participants all expressed satisfaction with the peer feedback experience and feedback they received from peers.

Regarding the differences, writers A and B received considerably more feedback concerned with problem identification than writer C. Moreover, writers A and B made a fairly a large proportion of macrostructure changes (writer A: 32%, writer B: 46.2%) relative to writer C (24%). Writer C made a larger proportion of meaning-preserving changes (36%) than the other two.

These results reflected their revision strategies. Writers A and B made a major revision between the first draft and the final version. Writer A changed a learning theory from the first draft to the final version to analyze the teaching approach in the videos in the first and second focus points. She deleted the whole section (including the description and analysis section) of the third focus point, since she had used a video different from that which she used in the proposal section. The result was a drastic change in the essay. Writer B made most changes to the first focus point section because for the final version she chose a different teaching approach and learning theory. She also deleted the whole section for the third focus point and composed completely new contents, since she introduced a different video, teaching approach, and learning theory. In contrast, in her final version, writer C retained the same video, teaching approaches, and learning theories as in her first draft. Therefore, for writers A and B, it was very difficult to determine the extent to which they had adopted the peer feedback they received. However, my revision coding process found that writers A and B adopted much less peer feedback (38.5% and 38.5% respectively) than writer C (81%). Finally, writer A nominated feedback as helpful which answered their own request. On the other hand, writers B and C nominated feedback which did not originate with their prior requests.

Chapter 7.

Discussions

The aim of this research was to investigate what student writers in an educational psychology course expected from peer reviewers, what those peer reviewers actually provided, how this feedback was used, and how the peer feedback experience might be enhanced. This investigation was conducted in the context of research-informed interventions designed specifically to enhance peer feedback. I addressed four main research questions. The first question concerned what constitutes helpful peer feedback from the writer's perspective. Inductive analysis identified the types of feedback requested by writers, and their concerns about their work, as well as the types of peer feedback identified by the writers as helpful. Changes in the requested types of feedback over time were also analyzed. Writers' revision behaviour in response to peer feedback was also investigated using a case study approach.

The second research question concerned peer review comments. The types and frequency of feedback comments constructed by peer reviewers were examined through comment analysis. The same method was used to investigate changes in feedback types constructed by peers over multiple writing assignments. The third research question concerned students' attitudes toward the peer feedback experience with the intervention tools used in the study. The fourth question explored students' interaction with the *Prior Question Tool* and their application of information from that tool. This chapter provides interpretations and explanations of the results and draws implications for designing peer feedback activities. The limitations of the current study will also be discussed.

7.1. Writers' Concerns about their Writing and their Preferences for Helpful Feedback

To address the first research question, I worked through the following sub-questions.

- What types of feedback do writers request from peer reviewers?

- What changes take place over time in the types of request comments?
- How do writers engage with the peer feedback process?
- What types of peer feedback comments influence writers' revision actions?
- What types of feedback do writers select as most useful?
- Do writers find feedback comments more useful when they identify problems, give directions or provide explanations?

The inductive comment analysis revealed that most writers were concerned about the substantive topic of the assignment including the content and subject knowledge expressed in their writing such as its accuracy, completeness, and specificity. Writers also asked reviewers to check the organization, language use, and format of their papers. These results indicated that writers were aware of what aspects of their work would be assessed for grading and took these assessment criteria as their primary emphasis during their draft writing process. The largest proportion of the writers' concerns focused on the topic of the assignment, such as the content of the paper and their expressed knowledge of the subject, while concerns regarding organization, language, and format were far less frequent. Concerns about organization were slightly more frequent than those regarding language and format. In the current study, it appears that writers sought feedback about topic and organization issues, which are "higher order concerns," such as the structure of ideas and themes (Keh, 1990) rather than the language and the format issues which are "lower order concerns" such as writing mechanics (e.g., grammar and word choice) (Keh, 1990). One explanation of this would be that the writers can now access online services such as Grammarly that assist with writing mechanics. The fact that Grammarly is now widely used by undergraduate students may have diminished writers' interest in feedback about grammar and writing mechanics.

The writers' feedback needs shifted over iterations of the essay assignment in the course. The frequency with which writers expressed needs for content-related and subject-related feedback (topic-related feedback) increased with every assignment. Their requests for format-related and presentation-related feedback decreased considerably, while their requests for organization-related and language-related feedback showed little change. This result is consistent with the findings of Ene and Upton (2014) and Van den Bos & Tan (2019) who stated that lower-order concerns are

more straightforward to address than higher-order concerns, since writers need superior writing skill and knowledge to manage higher-order concerns. Of course, it matters that the writing assignments central to this study provided consistent instructions and evaluation criteria.

A similar trend was identified in the *Helpful Feedback Survey*. In the survey, writers identified helpful feedback they received. The number of topic feedback and organization feedback comments identified by writers as helpful increased from the first assignment to the second assignment, while the number of language and format feedback comments identified as helpful decreased. These results suggest that the writers seek feedback about higher order concerns from the peer reviewers and appreciate such feedback as well, rather than the feedback about lower order concerns as they practiced the peer feedback process. Another explanation for the decline in requests for format feedback is that writers became more confident about their understanding of the prescribed paper format in the second and third assignments after learning about it in the first assignment.

The results from the survey also indicated that writers preferred neutral feedback over other affective feedback types in every assignment. The writers did not place much value on positive affective feedback in the current study. This result broadly reflects Ferris's (1997) and Hattie and Timperley's (2007) claim about no influence of positive affective comments on writers. A possible explanation is that positive feedback was seldom accompanied by directive feedback and other types of cognitive feedback. This research says little about writers' attitudes toward feedback with negative affect since no negative comments were identified in the current study.

In the cognitive feedback dimension, I found corrective feedback was never nominated as helpful by writers in the survey. As I mentioned earlier, this may be due to the popularization of automated grammatical support services. Writers considered directive feedback, which often appeared in combination with other cognitive feedback, as most helpful. Interestingly, directive feedback with explanation, which was rarely constructed by reviewers, was deemed helpful less often than merely directive feedback. This result reflects Lu and Law's (2012) finding that reviewers seldom constructed explanatory feedback as mentioned in Chapter 3. It is possible that writers preferred directive feedback without explanation because it is simpler and less cognitively

demanding to address. Moreover, explanatory feedback generated by peer reviewers may not be as clear as that made by experts (Nelson & Schunn, 2009). Low-quality explanations may also make writers struggle to fully understand the received feedback (Lu & Law, 2012). Writers may dismiss explanatory feedback due to reviewers' inability to provide clear explanations (Nelson & Schunn, 2009). Another explanation for why explanatory feedback was not nominated could be that the survey question limited the number of feedback comments writers could nominate. Writers were not allowed to nominate more than two of the most helpful comments. They may have nominated explanatory feedback if they were allowed to nominate more than two feedback comments. In fact, writer B in the case study received five explanatory comments. She adopted one of the explanatory comments in her revision and nominated it as the most helpful feedback comment (Unit #10). Writer C received five explanatory comments, adopted three comments (Unit # 6, 8, and 12), and nominated one explanatory comment (Unit #12). Although some of those explanatory comments were very short and simple, some were specific and detailed.

The survey results showed writers most appreciated topic-related peer feedback which was neutral and directive. The results also revealed that specific feedback provided on the side margin was nominated as helpful considerably more often than overall feedback, and the number of such comments increased from the first to the second assignment. As described in Chapter 4, the overall section in the *Prior Question Tool* was geared toward global concerns, whereas the specific section was designed to accommodate local issues. One interpretation is that the writers may be overwhelmed or incapable of acting on global feedback because it is less directive or less specific in what action it recommends (Nelson & Schunn, 2009).

That having been said, feedback that was neutral, directive, topic-related, and local was not necessarily adopted as a basis for revisions. For instance, in the third case study, the writer did not adopt two items of feedback which were (a) neutral and only provided explanation about the topic-related feedback which the reviewer constructed, and (b) neutral and pointed out a language issue with explanation and direction to improve the writer's work. These feedback comments each contain at least one of the feedback types which were considered helpful by other writers. We may hypothesize that feedback should include all highly appreciated feedback types; however, this inference is uncertain due to the small sample size of the current study. Among 51

feedback comments in the three cases, only two instances of non-adopted feedback were identified. More extensive research is thus needed to analyze feedback adoption.

The case studies also revealed that the comments made by reviewers in response to the writers' requests or concerns were often not judged helpful by writers. Instead, the writers in case studies 2 and 3 selected as helpful the feedback constructed on an unprompted basis (see Example 2.4, 2.5, and 3.3). This finding was contrary to expectations, as other scholars have suggested that feedback should be based on writers' requests precisely because it would be regarded as more effective and helpful (Gibbs & Simpson, 2004; Nicol, 2009). Moreover, it has been claimed such feedback would be regarded by writers as more personalized and as a result would invite writers' attention and application (Gielen, Peeters, et al., 2010; Gielen, Tops, et al., 2010).

As discussed in Chapter 3, some peer feedback research has demonstrated improvement in the quality of feedback through a prior question intervention (e.g., Gielen & De Wever, 2015; Gielen, Tops, et al., 2010), but other research found no benefit (e.g., Voet et al., 2018). As Voet et al. explained, beneficial effects of peer feedback may be diminished if writers consider peers less credible as reviewers. In such cases, writers do not feel obligated to use peer feedback or trust it. In the *Peer Feedback Experience Questionnaire* in the current study, the majority of students agreed that their peers may not have sufficient knowledge to provide feedback, and half of them perceived peer feedback as lacking clarity and applicability. Yet, the majority of students reported that their peers were able to take responsibility as feedback providers and their feedback could usefully augment that provided by a teacher. The writer in the third case study adopted most of the feedback she received and reported that she had confidence in the reviewer's ability to construct adequate feedback. Writers' inability to identify what kind of help they need may have limited the utility of the requests they made to reviewers (Agricola, Prins, & Sluijsmans, 2020; Bloxham & Campbell, 2010). This inability may cause them to make ambiguous requests or avoid making requests. These considerations demonstrate that students' attitudes to peer feedback and its influence on their revision behavior is complex. Thus, further research needs to be conducted for more comprehensive understanding.

The results of the case studies also suggest that the level of revisions undertaken by writers may affect the quality of the final version as well as the relevance

and usefulness of peer feedback. The writers in case studies 1 and 2, who were considered to have lower and middle assignment performance respectively made drastic changes between the first draft and the final version. They deleted several sections present in the first draft and rewrote new ones from scratch in the final version. Thus, they made a large volume of macrostructure changes. In contrast, the writer in case study 3, who received high grades on the assignments, maintained the contents of her first draft, even though she shared her doubts about her choice of theories on the *Prior Question Tool*. She made more meaning-preserving changes than macrostructure changes. In addition, the high-ability writer made fewer revisions than the lower ability writers.

This result can be explained by the level of students' writing ability (Hayes, 2000; Patchan & Schunn, 2016). As mentioned in Chapter 2, some theorists claim the more revisions writers make, the more cognitive effort they need to expend (e.g., Beach, 1976; Hayes et al., 1987), which leads to the idea that the greater extent of revisions could be an indicator of higher writing ability. The results of the current study, however, seem to favour Dieterich's (1976) and Bridwell's (1980) claims, which take an opposing view. Dieterich (1976) pointed out that a good writer may not need to engage in heavy revision of the initial draft if its quality is already good enough. It is natural, therefore, to infer that the quality of the final version may be somewhat affected by the quality of the first draft presented for peer review. In the case analysis, the student with the highest final score on her essay did not revise the first draft as much as the two writers with relatively lower ability.

The lower ability writer and the middle ability writer in the current study deleted a large volume of written work from the first draft to add new information, ideas, and arguments. This result reflects Patchan and Schunn's (2016) finding that lower ability writers tended to use peer feedback provided by lower ability students, as mentioned in Chapter 3. Moreover, lower ability writers choose to rewrite or delete, since these actions are a less complicated strategy than revising (Hayes et al., 1987). Hayes et al. (1987) cautioned that deleting a large volume of written work may diminish the quality of the finished product. One reason for the detrimental effect of deletion may be that new information added in the final version would not have the benefit of being reviewed by peers.

7.2. Feedback Constructed by Peer Reviewers

The second research question in the current study aimed to identify what types of feedback reviewers constructed. It further inquired how the proportions of these types of feedback changed through the iterations of the peer feedback process.

The analyses of the reviewers' comments revealed that, overall, the peer reviewers constructed more neutral, problem-identifying, directive, and topic-related feedback than other types. No feedback with negative affective tone was identified in the present study. This finding can be interpreted as the result of the non-anonymous peer feedback design implemented in the current study. Anonymity means that peer reviewers are less concerned about offending the writer and leads to more critical feedback (Panadero & Alqassab, 2019). In a non-anonymous setting, it is reasonable to suppose that reviewers avoid providing overly critical feedback. Cheng, Hou, and Wu (2014) reported that peer reviewers expressed negative emotions when they provided feedback which could potentially distress writers, who were their friends, in a non-anonymous setting. Moreover, it seems possible that the finding in the current study is related to the training sessions. During training, students learned about various helpful and unhelpful feedback comment types. Respectful feedback was recommended as more helpful.

In-depth analysis of the cognitive feedback dimension indicated that most comments identified problems and most provided direction. In third place, corrective feedback was far less common. The result concerning direction is contrary to most previous research (e.g., Cho & MacArthur, 2011; Prins et al., 2006) which has found a lower frequency for directive feedback relative to other feedback types. Van den Bos and Tan (2019) explained that lack of direction in peer feedback is due to the reviewers' inability to construct directive feedback in general. There are two possible explanations for the contrasting findings in the present study. First, like Min's (2005) study, the training session provided in the present study may have influenced the reviewers' recognition or consciousness of the importance of directive feedback. Second, it can be assumed that the *Prior Question Tool* affected the reviewers' feedback construction, as Gielen and De Wever (2015) also found. As with all the results reported here, caution must be applied, as they are based on analysis of peer feedback in a single class setting. Further research should be undertaken to investigate the impact of the tool in other contexts.

Regarding the subcategories in the focus feedback dimension, most feedback pertained to topic. Language was in second place, followed by organization and format. The emphasis given to language by reviewers does not align with writers' stated needs. This contradiction may be explained by peer reviewers' tendency to notice lower-order concerns (Keh, 1990) and generate feedback regarding lower-order concerns which are less cognitively demanding, as discussed in Chapter 3. Since the construction of higher-order feedback requires greater cognitive skill (Van den Bos & Tan, 2019), adequate training and guidance are recommended to enhance reviewers' ability to construct this type of feedback (Min, 2005; Van den Bos & Tan, 2019). It also must be noted that peer reviewers often construct feedback about lower-order concerns, even when they are instructed, trained, or reminded through intervention tools that they do not need to do so (Patchan et al., 2009, 2013).

In the data from the *Prior Question Tool*, there were many more topic-related than organization-related requests from writers. It appears both writers and reviewers may not prioritize writing organization as much as topic-related matters. Two reasons could be considered for the lower priority they assume for organization. First, the instructor provided the specific structure of the essay assignments (see Figure 4.1 in Chapter 4). This helped students not to pay too much attention to organization, since they did not have to organize the essay structure from scratch. Second, it is reasonable to infer that reviewers' feedback rarely addressed organization because writers rarely expressed a need for organization-related help.

With respect to the changes in the types of reviewers' feedback over time, none of the subcategories in the affective dimension showed a continuous increase or decrease. Within the cognitive dimension, only problem identification feedback with explanation increased in frequency with every assignment, though it accounted for just a few percent of the whole. Feedback providing confirmation, problem identification feedback, and confirmation with explanation decreased over time. Within the focus dimension, topic-related feedback drastically increased from the first assignment to the third assignment and remained at the higher level in the second assignment. The organization and the format feedback decreased with every assignment. These findings can be explained in two ways. First, the reviewers' focus shifted in response to changes in writers' expressed needs. Second, the writers were able to spot organization-related and format-related errors in the initial draft, and then move on to other issues.

In addition, a couple of unanticipated findings were observed. First, the quantity of directive feedback considerably decreased in the second assignment. Second, the corrective feedback increased substantially in the second assignment. It is difficult to explain these results, but it is possible that reviewers lacked recognition of the writers' needs expressed via the *Helpful Feedback List*. The purpose of the list, which was shared with the students after the first and the second assignment, was to help the reviewers understand what feedback writers regarded as helpful, and to promote the construction of such feedback by reviewers. However, when they used the list for the first time, reviewers may not have known how to utilize it during their feedback construction process or to recognize and understand what types of feedback were considered helpful. One reason may be that the nominated examples of helpful feedback were listed in random order rather than in order of preference. Also, the design of the list could be improved to make it more informative; for instance, by organizing the nominated examples by feedback type (e.g., Directive, Explanation, Topic-related, Format).

Regarding the association between the frequency of comments constructed by the reviewers in each subcategory (provided feedback) and the comments nominated as helpful by the writers (preferred feedback), overall, similar patterns were observed in most of the affective subcategories, but some salient gaps were found in the cognitive and focus dimensions. In the cognitive dimension, larger gaps were found in the identify problem with direction, the identify problem only, and the correction feedback subcategories. In the focus dimension, gaps appeared for topic and language feedback.

The identify problem with direction and the topic feedback subcategories were more frequently demanded by writers and the proportion of these comments increased from the first to second assignment. On the other hand, the proportion of these in provided feedback was considerably lower than with preferred feedback, and that proportion decreased from the first to the second assignment. These gaps can be explained in part by insufficient peer feedback training and experience. Sluijsmans et al. (2002) gave reviewers extensive training and found those who received the training constructed a higher quality of feedback than reviewers who had not received training. However, since the reviewers in the training group failed to meet all criteria for constructive feedback, Sluijsmans et al. suggested that reviewers require a longer training period to raise their feedback skills to an expert level. After an in-depth case

study of undergraduate students in the U.K., McConlogue (2015) similarly concluded that peer reviewers need a significant amount of time and practice to raise their judgement and subject domain skills to a level allowing them to perform as reliable reviewers.

Even though there was little or no demand from writers for identify problem only, correction, and language feedback, the reviewers constructed a considerable amount of these types of feedback. Notably, the proportion of correction and language feedback increased from the first to the second assignment. As suggested by Nelson and Schunn (2009) and Lu and Law (2012), writers do not appreciate the provision of feedback that merely identifies a problem. It has to be made understandable to writers. My findings about writers' disinterest in corrective feedback are consistent with Truscott (1996) who claimed corrective feedback is ineffective. It is reasonable to infer that corrective feedback tends not only to be ineffective but also unwelcome.

More deserves to be said here about explanatory feedback. The demand for explanatory feedback by writers was fairly low. This may have led to the low frequency of feedback that included explanatory comments (including explanatory comments packaged with directive feedback). My results are consistent with the study by Lu and Law (2012), which reported relatively infrequent production of explanatory feedback by peer reviewers. Moreover, as mentioned in the previous section, novice reviewers, in particular, may not have the skill to explain their ideas clearly (Nelson & Schunn, 2009). Thus, they may hesitate or avoid generating this type of feedback. It seems likely that some reviewers need more training and practice to be able to participate effectively (McConlogue, 2015; Sluijsmans et al., 2002).

Turning now to feedback about language, as mentioned earlier in this section, a reason why reviewers constructed a considerable amount of this type of feedback (27%) is that they are inclined to address lower order issues (Keh, 1990), which are much easier to identify than higher order issues. ESL reviewers have a pronounced tendency to follow this pattern (Van Steendam et al., 2010). Only eight students (27.6%) of reviewers in the current study reported that their first language was not English. Therefore, it is inferred that not only English as additional language but also English as first language reviewers generated this type of feedback in the current study.

Finally, the number of writers who indicated the feedback they received was helpful remained about the same from the first *Helpful Feedback Survey* to the second survey. In apparent contradiction, the number of writers who expressed that the received feedback was *not* helpful increased from the first survey to the second survey, even though it was expected to decrease. Further complicating this picture is that over 70% of students reported in the *Peer Feedback Experience Questionnaire* that they received more helpful feedback in the second assignment than in the first assignment. In the first assignment, the number of writers who were unable to determine the helpfulness of the feedback was quite high, whereas only two writers were unable to make that determination it in the second assignment. This may mean that those who were not sure about the helpfulness of the feedback in the first assignment concluded that the feedback was not helpful in the second assignment. Another possible explanation for this is that approximately 54% of students admitted that feedback they generate is affected by the feedback they received, even though approximately 84% of students reported that they would do their best to provide helpful feedback no matter what quality of feedback they received. The 54% may have made fewer efforts to provide helpful feedback in the second assignment than the third assignment, since they were disappointed with the quality of feedback they received.

The increased belief that the feedback was unhelpful may be related to the unexpected pattern of cognitive and the focus feedback in the second assignment, whereby the directive feedback decreased, and the corrective and language-related feedback increased—both shifts being in opposition to writers' expressed needs. This gap between the writers' needs and the feedback provided may have resulted in an increase in the dissatisfaction expressed in the second survey.

7.3. Student Perceptions of the Peer Feedback Experience

Overall, most students had positive perceptions of the peer feedback process in all four subcategories (General, Online Implementation, Tool, and Received Feedback). They indicated an especially high level of satisfaction with the online peer feedback process. Moreover, the results in the Received Feedback subcategory indicated that they had a positive peer feedback experience as writers. This could suggest that the intervention tools may have positively affected the writers' attitudes, since overall results in the Tool subcategory also showed students felt positively about it. However, this

inference may be limited, since the proportion of students' agreement in the Tool subcategory was lower than in other categories. Students' attitudes toward the *Helpful Feedback List* were quite low. Furthermore, it is important to note that only 58% of students felt that the *Helpful Feedback List* helped them to save time, despite the fact that it was intended to support reviewers in constructing useful feedback and reducing their time on task. As I mentioned previously in this chapter, there may have been insufficient training in how to use the list. Further work needs to be done to improve its usability for reviewers.

Even though students perceived the peer feedback experience positively in the current study, some negative attitudes were identified. Half of the students reported that feedback they received was ambiguous or irrelevant to revising a draft (Q33). This somewhat differs from the result of the *Helpful Feedback Survey*, on which over 60% of students indicated that feedback which they received was helpful. This discrepancy may be an indication of inconsistent quality in peer feedback. Although two tools were implemented to improve the benefits of peer feedback for writers, it seems that the tools were not sufficient to eliminate dissatisfaction. The results also indicated that approximately 80% of students doubted their peers' ability as reviewers (Q32). This could be an indication of ingrained doubt about peers' ability to provide useful feedback. Moreover, this ingrained doubt could explain why over 50% students reported that the quality of feedback they received affects their own feedback construction (Q14). However, we should not ignore that over 80% of students reported that they would still try to provide helpful feedback even though the quality of feedback which they received was poor (Q15).

Students' attitudes toward the time efficiency of the peer feedback process were split—half had a positive attitude and half had a negative attitude (Q13). This finding was somewhat unexpected, since one of the purposes of the *Helpful Feedback List* was to ease the reviewers' task in constructing useful feedback. As Duijnhouwer et al. (2012) noted, time-consuming tasks may affect students' motivation. When they must handle multiple tasks for the courses in which they are enrolled, they may feel that providing feedback for their peers imposes an unnecessary burden. To untangle some issues which impede students from active participation in the peer feedback process, further research should be undertaken to investigate the relationship between students' motivation and their participation in the peer feedback process.

7.4. Prior Question Tool

Results relevant to the fourth research question are discussed in this section. With regard to the writer-reviewer interaction, even though the statistical analysis revealed that the writers most likely received a response to their requests from the reviewer, 15.2% of writers' comments did not receive a response. One unanticipated finding was the decrease in response feedback that was requested by writers using the *Prior Question Tool* over the three assignments. One possible explanation is that the number of reviewers who participated in the peer feedback process decreased in the second (25 out of 31 reviewers) and the third (26 out of 31 reviewers) assignments. When the writers' assigned reviewers did not submit the peer feedback, the interaction type was coded as 'did not get response' in the current study. An additional explanation might be some students' inability to identify global issues (Hayes et al., 1987). In the case studies, reviewers were less likely to reply to writers' request comments in the overall section of the template, which primarily targeted global issues, than they were to reply to requests in the specific comment section.

In terms of the reviewers' interaction type, the reviewers produced more unprompted comments rather than comments which responded to the writers' requests. Interestingly, the proportion of reviewer comments that were replies declined from the first assignment to the second assignment and stayed the same from the second to the third assignment. Since knowing writers' needs or concerns should in principle lead peer reviewers to construct more helpful feedback (Gielen et al., 2010; Voet et al., 2018), the proportion of the reply feedback comments was expected to increase, especially when the writers' request/question comments increased.

This unexpected finding could be due to a decrease in the number of participating reviewers over time, as mentioned earlier. It also could be that reviewers did not read the writers' requests due to lack of time or motivation. Through an anecdotal conversation with the instructor, the researcher learned that students sometimes felt overwhelmed by the number of assignments across all the courses they were enrolled in. The timing of the second assignment for this course overlapped with midterm exams and assignment due dates for other courses. Furthermore, the timing of the third assignment due date also overlapped with the end of term assignment due dates for other courses. The reviewers were awarded just two points for participation in the peer

review process, and this reward may not have been sufficient to incentivize the reviewers. According to Duijnhouwer et al. (2012), students do not use intervention tools if the tools were previously used and are time consuming, unsuitable to students' writing practice, or treated them as primitive learners. Thus, alternative instructional designs may be needed to incentivize reviewers over a progression of peer feedback opportunities. For instance, to motivate peer reviewers, instructors could evaluate the feedback they construct (Choi, 2014). However, this extrinsic motivation strategy places an additional burden on instructors, and an intrinsic motivation strategy such as incorporating more dialogue between the writer and reviewer to deepen interpersonal engagement may ultimately be more effective and practical.

I turn now to the utilization of the *Prior Question Tool*. Approximately 60% of the reviewers fully used the tool, while approximately 40% of the writers fully used it. In the previous Chapter, I mentioned two possible explanations for this outcome: the motivational gap, and the gap between the writers' and the reviewers' perceptions of the benefit of providing feedback requests as a writer and constructing feedback as a reviewer. In terms of the first gap, reviewers may have been motivated by the availability of a completion mark, which writers were not given for completing the *Prior Question Tool*. In addition, because the reviewers' identity was known by their writer, reviewers would have tried to avoid the reputational cost of non-participation. It should be noted that reviewers' participation decreased over time, even though this meant foregoing the participation credit.

In terms of the second gap, writers may have taken a while to understand the concept of the new tool and become familiar with it. To reduce the second gap, one possible strategy is to spend more time enhancing writers' abilities to provide effective requests/questions (Agricola et al., 2020; Bloxham & Campbell, 2010). Writers often struggle to construct effective request comments, since their understanding of the expected written work (Bloxham & Campbell, 2010) and their abilities to choose effective strategies (Agricola et al., 2020) are limited. Thus, an opportunity for writers to practice writing request comments and discuss them in class should be provided (Agricola et al., 2020).

7.5. Design Implications

The results of the current study indicate that, to a certain degree, the reviewers constructed feedback that was aligned with the writers' needs using a feedback process that featured two intervention tools—the *Prior Question Tool*, and the *Helpful Feedback Survey and Sharing (HFSS) Tool*. Therefore, incorporating these intervention tools in courses which require writing tasks should be considered. To incorporate the intervention tools in a course design and maximize their effectiveness, a few suggestions are offered here.

First, menus or headings could be added to the *Prior Question Tool* that provide (a) standardized feedback types with a description for each type, and (b) evaluation criteria for the writing assignment. The current study found reviewers generally constructed the most helpful feedback types as indicated by writers (Neutral, Direction, Topic). However, in-depth analysis identified other feedback types regarded as helpful by writers that were often not constructed in response to writers' requests. Emphasizing and informing reviewers about these other types through the use of menus could increase the efficacy of the tool. Providing the assignment evaluation criteria in the menus would also help writers and reviewers generate more relevant requests and comments. Even though the criteria were provided in a written format and explained by the instructor in class, a constant reminder would help students to pay more attention to them.

Second, a better organized and more user-friendly *Helpful Feedback List* should be designed. To guide reviewers in recognizing helpful feedback, additional features could be added, such as detailed instructions and explanations about the usefulness of the list, as well as the ability for users to sort the list according to types of feedback. Peer-to-peer or group discussions analyzing the *Helpful Feedback List* could also be adopted to raise students' awareness of its value (Nicol & Macfarlane-Dick, 2006).

Third, certain components should be retained in the training session, as it appears that training helped reviewers construct more directive feedback. However, in-depth analysis revealed reviewers may need further training to meet writers' expectations (e.g., more focus on higher order feedback including organizational structure and explanatory feedback). On top of that, repeated, cumulative training may

be necessary, since acquiring advanced reviewing and feedback construction skills takes time (Gielen & De Wever, 2015; McConlogue, 2015; Sluijsmans et al., 2002).

Finally, opportunities should be provided for dialogue between each writer and reviewer to discuss the writer's concerns as well as the meaning of the received feedback. The dialogue not only improves writers' self-regulated learning and self-efficacy but helps reviewers to create more constructive feedback (Zheng, Cui, Li, & Huang, 2018). Nicol and Macfarlane-Dick (2006) asserted that dialogue between writers and reviewers is a key component for promoting effective peer feedback. While peer feedback already incorporates a dialogical component (Carless, 2015; Filius, de Kleijn, Uijl, Prins, Van Rijen, & Grobbee, 2018), Er, Dimitriadis and Gašević (2020) emphasized the importance of a more extended dialogical process. In their theoretical framework of dialogic peer feedback, writers and reviewers engage in a three-phase dialogue. In the first phase, a dialogue is held to plan and coordinate the peer feedback process. In the second phase, a dialogue is engaged to find what type of feedback is needed. In the third phase, writers and reviewers discuss the meaning of the received feedback. Mapping the current study onto the three-phase model of Er et al. (2020), the detailed peer feedback process instruction and training was the first phase and the *Prior Question Tool*, which gives writers opportunities to convey what type of feedback they need, was the second phase. Because the available class time was limited, the *Prior Question Tool* was perhaps a more feasible way to implement the goals of the second phase. What was missing in the current study was the third phase. Among these three phases, the third one seems the most likely to increase the effectiveness of the *Prior Question Tool* and may be the most deserving of implementation and evaluation in future research.

It is important to reduce writers' misunderstanding of the feedback they received from peer reviewers, since the level of a writer's understanding of the feedback is significantly related to their use of it (Nelson & Schunn, 2009). Situating the dialogue after the written feedback process helps writers frame appropriate questions, since they can get more concrete ideas about the strengths and weaknesses of their work (Bloxham & Campbell, 2010). The effectiveness of the dialogue between writers and reviewers will be enhanced when it is held through spoken communication (Agricola et al., 2020; Jonsson, 2013; McConlogue, 2015). Agricola et al. (2020) found that writers' attitude toward the peer review process was more positive when they received spoken

rather than written feedback. In real-time, spoken dialogue, writers and reviewers have opportunity for more immediate questions and answers to ensure writers' understanding and interpretation of the feedback.

7.6. Limitations and Future Research

Several limitations of the current study need to be addressed. First, as mentioned in an earlier section, for many feedback comments it was not possible to determine with confidence whether or not they were adopted by writers. In the first and second case studies, writers made drastic changes to their work between the first draft and the final version, which included macrostructure changes and rewriting. It was therefore very difficult to determine if the changes were made based on the reviewers' feedback or other factors, even though the reviewers provided topic-related feedback with directions relevant to the revised sections.

One of the factors shaping these writers' revisions besides peer feedback could be feedback or advice from the instructor. The writers had a chance to receive consultation from the instructor before, after, or during the in-class lecture time. They might have revised their first draft based on the instructor's guidance. It is also possible that revisions were made based on the writers' own judgement even before they received feedback (Van der Pol et al., 2008). As described in Chapter 3, learners generate internal feedback (Butler & Winne, 1995), and to some extent they are capable of setting their own standards for an assignment and, through self-explanation, improving a written product to meet that standard (Nicol & Macfarlane-Dick, 2006).

To assess more accurately the effect of specific feedback on revision behavior, researchers should develop other measurement strategies (Fitzgerald, 1987). The current study employed the "coding system" (p. 485) strategy. According to Fitzgerald, one of the weak points of this strategy is that it cannot accurately track the writer's revision process. "Process-tracking" (p. 486) such as conducting a think-aloud study, interviewing, filling in a self-assessment sheet, and recording self-assessment (Fitzgerald, 1987) are other strategies that could be adopted in future research to address the problem of indeterminacy.

Second, the current study analyzed helpful feedback from the writers' viewpoint. However, feedback identified as helpful by writers does not necessarily equate with feedback that is effective in improving writers' performance (Patchan et al., 2009). Further studies should be conducted that explore the relationship between the feedback identified as helpful in the current study and writers' performance.

Third, the writers were selected for the case studies based on their scores in the second assignment and other selection criteria developed to ensure sufficient data to develop a case. The number of writers who met the defined criteria turned out to be very small. Therefore, the selected writers may not appropriately represent the targeted ability levels. Since learning ability is associated with diverse factors such as motivation and performance, future research which focuses on other ability factors is therefore suggested.

Fourth, to leverage the potential of the *Helpful Feedback List,* which was incorporated in the *HFSS Tool*, all three analytical writing assignments intentionally adopted the same or similar topic, task, and format in the current study. Thus, the reviewers could use or refer to the feedback comments in the list for the next assignment. This tool may not be usable when instructors give multiple writing assignments which are significantly different from each other.

Fifth, the current study made extensive use of descriptive statistics due to the small sample size. Although descriptive statistics may be helpful for fostering naturalistic generalization (Stake, 1995), they do not address sampling error and are therefore not statistically reliable. Inferential research with larger samples is needed to confirm any descriptive statistics presented in this thesis. The inferential analyses, the chi-square tests, are also subject to limitations. The multiple inferential tests used in the analysis increased the probability of type I error. The interactions between students in their roles as writers and reviewers and the contribution of multiple comment units by each student also contradicted the chi-square assumption of independence of the individual comment units that were analyzed.

Sixth, the purpose of the current study was to understand the writer's experience and actions in the peer feedback process; therefore, the reviewer's experience and actions were not emphasized. However, we must not forget that reviewer factors such as

writing ability, academic goals and motivations, and personality, have an impact on the writer's experience of peer feedback. Reviewers' individual differences are known to be a major influence on writers' use of feedback (Winstone et al., 2017). Research has reported that reviewers' ability affected the types of feedback comments constructed (e.g., Cho & Cho, 2011; Hamer et al., 2015; Patchan & Schunn, 2015). Moreover, strategies for matching writers and reviewers based on their ability (e.g., matching the same ability or different ability of writers and reviewers) have been debated (e.g., Huisman, Admiraal, et al., 2018; Huisman et al., 2017; Patchan & Schunn, 2016; Patchan et al., 2013). In the current study, writers and reviewers were randomly matched by the peer feedback tool in the LMS. Thus, a study which provides a more holistic focus on interactions among writers and reviewers could complete the picture of the peer feedback process outlined in this thesis.

7.7. Summary

In the current study, data were collected in a course on instructional psychology. Three analytical essay assignments were developed with the aim of enhancing and assessing students' understanding of the concepts presented in the course. The peer feedback approach was used since the effectiveness of peer feedback on student learning has been shown in previous studies. In this context, I investigated what sorts of feedback writers wanted from peer reviewers and how writers might obtain greater benefit from the peer feedback process.

Two intervention tools were utilized: the *Prior Question Tool* and the *HFSS Tool*. Each was designed to strengthen the benefits of peer feedback for writers and help instructors and instructional designers understand helpful peer feedback from the writer's perspective. Four research questions were addressed:

> Q1: What types of feedback comments were seen as helpful by writers, and what types did they use?
>
> Q2: What types of feedback comments do reviewers make, and how do they change as the peer feedback process iterates?
>
> Q3: What were students' attitudes toward the peer feedback experience with interventional strategies?

Q4: How closely did students adhere to the instructions they were given for the peer feedback process?

With respect to the first research question, overall, writers sought peer feedback related to the assessment criteria set up by the instructor, which included topic (contents of an essay and accuracy of the writer's subject knowledge), organization (structure of the analytical paper), language (writing mechanics and word choices), and format (writing and citation format). Most often, writers asked peer reviewers to provide feedback about the topic of the essay. The results of this study revealed that writers selected problem-identifying, directive, and topic-related feedback as helpful. No corrective comments or explanatory comments which did not include problem identification or direction were nominated as most helpful feedback by writers. Also, language-related and format-related feedback comments were rarely nominated. However, the case study analysis indicated that writers did not always adopt feedback that contained the types of feedback they considered helpful.

The case study analysis illustrated the complexity of writers' revision actions. While various factors affect writers' revision actions, this study focused mainly on the content of the peer feedback and the writers' individual differences. These factors evidently affected the revision actions undertaken by writers. High ability writers may not need to make significant revisions no matter what sorts of feedback they received, since their drafts may already be high in quality. However, students whose drafts are poor in quality need to make more revisions. In such cases, feedback may be disregarded when the writers decide to rewrite extensive areas of their papers.

In answer to the second research question, reviewers constructed more problem identifying, directive, and topic-related feedback than other feedback types. One can speculate that this alignment was due to the intervention tools. One explanation is that reviewers showed a strong tendency to respond to writers' requests and that their attitudes toward the tools were generally positive.

There was little sign of significant shifts in types of reviewer feedback over time. A continuous increase or decrease in every assignment was not observed in affective feedback, focus feedback (except format), and cognitive feedback (except comments that include confirmation and explanation).

With regard to the third research question, this study found that students' attitudes towards the peer feedback experience were generally positive. However, students' attitudes toward the tools (the *Prior Question Tool* and *HFSS Tool*) were not as positive as expected. Moreover, some negative attitudes were identified. Half of the students perceived that the peer feedback process was time-consuming, and feedback constructed by peers was unclear and useless. A substantial number of students doubted their peers' ability to provide effective feedback. Also, nearly half of students reported that the amount of effort they put forth to construct feedback and the quality of the constructed feedback were affected by the quality of the feedback they had received.

Regarding the fourth research question, the writers did not utilize the *Prior Question Tool* as fully as the reviewers. This may be due to the lack of a completion mark for writers utilizing the tool or lower sense of social responsibility associated with the writer role. It may also be due to insufficient ability of writers to articulate their needs. Greater utilization rates by writers might be obtained by providing more comprehensive and more convincing explanation of the benefits of the tool.

When writers provided their requests and concerns in advance, they usually received a response from reviewers. However, reviewers' responses to requests decreased over time. This may be due to the lower number of reviewers who participated in the reviewing activity in the second and third assignment, or reviewers participating but disregarding writers' request comments.

This research found that many writers formed positive attitudes toward the *Prior Question Tool* and the *Helpful Feedback Survey and Sharing Tool*. However, the attitudes were not consistent across all students and assignments. Some design modifications, therefore, are necessary to ensure a sound peer feedback process with the tools. I have identified various limitations of this research and made suggestions for future research. To pursue improvement of the peer feedback experience for writers, further studies adopting different quantitative and qualitative designs are needed.

References

Ackerman, J. M. (1993). The Promise of Writing to Learn. *Written Communication*, *10*(3).

Agricola, B. T., Prins, F. J., & Sluijsmans, D. M. A. (2020). Impact of feedback request forms and verbal feedback on higher education students' feedback perception, self-efficacy, and motivation. *Assessment in Education: Principles, Policy & Practice*, *27*(1), 6–25. https://doi.org/10.1080/0969594X.2019.1688764

Althauser, R., & Darnall, K. (2001). Enhancing Critical Reading and Writing through Peer Reviews: An Exploration of Assisted Performance. *Teaching Sociology*, *29*(1), 23. https://doi.org/10.2307/1318780

Ames, C. (1992). Classrooms: Goals, Structures, and Student Motivation. *Journal of Educational Psychology*, *84*(3), 261–271.

Applebee, A. N. (1984). Writing and reasoning. *Review of Educational Research*, *54*(4), 577–596.

Arnold, K. M., Umanath, S., Thio, K., Reilly, W. B., McDaniel, M. A., & Marsh, E. J. (2017). Understanding the cognitive processes involved in writing to learn. *Journal of Experimental Psychology: Applied*, *23*(2), 115–127. https://doi.org/10.1037/xap0000119

Baadte, C., & Schnotz, W. (2014). Feedback Effects on Performance, Motivation and Mood: Are They Moderated by the Learner's Self-Concept? *Scandinavian Journal of Educational Research*, *58*(5), 570–591. https://doi.org/10.1080/00313831.2013.781059

Ballantyne, R., Hughes, K., & Mylonas, A. (2002). Developing Procedures for Implementing Peer Assessment in Large Classes Using an Action Research Process. *Assessment & Evaluation in Higher Education*, *27*(5), 427–441. https://doi.org/10.1080/0260293022000009302

Bangert-Drowns, R. L., Hurley, M. M., & Wilkinson, B. (2004). The Effects of School-Based Writing-to-Learn Interventions on Academic Achievement: A Meta-Analysis. *Review of Educational Research*, *74*(1), 29–58. https://doi.org/10.3102/00346543074001029

Bangert-Drowns, R. L., Kulik, C.-L. C., Kulik, J. A., & Morgan, M. (1991). The Instructional Effect of Feedback in Test-Like Events. *Review of Educational Research*, *61*(2), 213–238.

Baranik, L. E., Stanley, L. J., Bynum, B. H., & Lance, C. E. (2010). Examining the Construct Validity of Mastery-Avoidance Achievement Goals: A Meta-Analysis. *Human Performance*, *23*(3), 265–282. https://doi.org/10.1080/08959285.2010.488463

Bazerman, C., Little, J., Bethel, L., Chavkin, T., Fouquette, D., & Garufis, J. (2005). *Reference guide to writing across the curriculum*. Parlor Press and WAC Clearinghouse.

Beach, R. (1976). Self-Evaluation Strategies of Extensive Revisers and Nonrevisers. *College Composition and Communication*, *27*(2), 160. https://doi.org/10.2307/356982

Beason, L. (1993). Feedback and Revision in Writing across the Curriculum Classes. *Research in the Teaching of English*, 395–422.

Biber, D., Nekrasova, T., & Horn, B. (2011). *The effectiveness of feedback for L1-English and L2-writing development: A meta-analysis* (No. 1; ETS Research Report Series).

Biggs, J., & Tang, C. (2011). *Teaching for Quality Learning at University*.

Bisra, K., Liu, Q., Nesbit, J. C., Salimi, F., & Winne, P. H. (2018). Inducing Self-Explanation: A Meta-Analysis. *Educational Psychology Review*, *30*(3), 703–725. https://doi.org/10.1007/s10648-018-9434-x

Bitchener, J. (2008). Evidence in support of written corrective feedback. *Journal of Second Language Writing*, *17*(2), 102–118. https://doi.org/10.1016/j.jslw.2007.11.004

Bitchener, J., Young, S., & Cameron, D. (2005a). The effect of different types of corrective feedback on ESL student writing. *Journal of Second Language Writing*, *14*(3), 191–205. https://doi.org/10.1016/j.jslw.2005.08.001

Bitchener, J., Young, S., & Cameron, D. (2005b). The effect of different types of corrective feedback on ESL student writing. *Journal of Second Language Writing*, *14*(3), 191–205. https://doi.org/10.1016/j.jslw.2005.08.001

Black, P., & Wiliam, D. (1998). Assessment and Classroom Learning. *Assessment in Education: Principles, Policy & Practice*, *5*(1), 7–74. https://doi.org/10.1080/0969595980050102

Bloxham, S., & Campbell, L. (2010). Generating dialogue in assessment feedback: Exploring the use of interactive cover sheets. *Assessment & Evaluation in Higher Education*, *35*(3), 11.

Boud, D., & Molloy, E. (2013a). Decision-making for feedback. In D. Boud & E. Molloy, *Feedback in higher and professional education understanding it and doing it well* (p. 17). Routledge.

Boud, D., & Molloy, E. (2013b). What is the problem with feedback? In D. Boud & E. Molloy, *Feedback in Higher and Professional Education: Understanding It and Doing It Well* (pp. 1–10). Routledge.

Bounds, R., Bush, C., Aghera, A., Rodriguez, N., Stansfield, R. B., Santen, S. A., & The MERC at CORD Feedback Study Group. (2013). Emergency Medicine Residents' Self-assessments Play a Critical Role When Receiving Feedback. *Academic Emergency Medicine*, *20*(10), 1055–1061. https://doi.org/10.1111/acem.12231

Bouzidi, L., & Jaillet, A. (2009). Can online peer assessment be trusted? *Journal of Educational Technology & Society*, *12*(4), 257–268.

Bridwell, L. S. (1980). Revising Strategies in Twelfth Grade Students' Transactional Writing. *Research in the Teaching of English*, *14*(3), 27.

Broadhead, G. J. (1999). Addressing Multiple Goals for Engineering Writing: The Role of Course-Specific Websites. *Language and Learning Across the Disciplines*, *3*(2), 19–43. https://doi.org/10.37514/LLD-J.1999.3.2.03

Bruning, R., Dempsey, M., Kauffman, D. F., McKim, C., & Zumbrunn, S. (2013). Examining dimensions of self-efficacy for writing. *Journal of Educational Psychology*, *105*(1), 25–38. https://doi.org/10.1037/a0029692

Butler, D. L., & Winne, P. H. (1995). Feedback and Self-Regulated Learning: A Theoretical Synthesis. *Review of Educational Research*, *65*(3), 245–281. https://doi.org/10.3102/00346543065003245

Cao, Z., Yu, S., & Huang, J. (2019). A qualitative inquiry into undergraduates' learning from giving and receiving peer feedback in L2 writing: Insights from a case study. *Studies in Educational Evaluation*, *63*, 102–112. https://doi.org/10.1016/j.stueduc.2019.08.001

Carless, D. (2015). Promoting student engagement with feedback. In *Excellence in University Assessment: Learning from Award-Winning Practice*. Routledge. Retrieved from https://ebookcentral-proquest-com.proxy.lib.sfu.ca

Carter, M., Ferzli, M., & Wiebe, E. N. (2007). Writing to Learn by Learning to Write in the Disciplines. *Journal of Business and Technical Communication*, *21*(3), 278–302. https://doi.org/10.1177/1050651907300466

Cartney, P. (2010). Exploring the use of peer assessment as a vehicle for closing the gap between feedback given and feedback used. *Assessment & Evaluation in Higher Education*, *35*(5), 551–564. https://doi.org/10.1080/02602931003632381

Centra, J. A., & Potter, D. A. (1980). School and Teacher Effects: An Interrelational Model. *Review of Educational Research*, *50*(2), 273–291.

Chen, Y., & Tsai, C. (2009). An educational research course facilitated by online peer assessment. *Innovations in Education and Teaching International*, *46*(1), 105–117. https://doi.org/10.1080/14703290802646297

Cheng, K.-H., & Hou, H.-T. (2015). Exploring students' behavioural patterns during online peer assessment from the affective, cognitive, and metacognitive perspectives: A progressive sequential analysis. *Technology, Pedagogy and Education*, *24*(2), 171–188. https://doi.org/10.1080/1475939X.2013.822416

Cheng, K.-H., Hou, H.-T., & Wu, S.-Y. (2014). Exploring students' emotional responses and participation in an online peer assessment activity: A case study. *Interactive Learning Environments*, *22*(3), 271–287. https://doi.org/10.1080/10494820.2011.649766

Cheng, K.-H., Liang, J.-C., & Tsai, C.-C. (2015). Examining the role of feedback messages in undergraduate students' writing performance during an online peer assessment activity. *The Internet and Higher Education*, *25*, 78–84. https://doi.org/10.1016/j.iheduc.2015.02.001

Cheng, W., & Warren, M. (1997). Having second thoughts: Student perceptions before and after a peer assessment exercise. *Studies in Higher Education*, *22*(2), 233–239. https://doi.org/10.1080/03075079712331381064

Chenoweth, N. A., & Hayes, J. R. (2001). Fluency in writing Generating text in L1 and L2. *Written Communication*, *18*(1), 80–98.

Chi, M. T. H. (2021). The Self-Explanation Principle in Multimedia Learning. In R. E. Mayer & L. Fiorella (Eds.), *The Cambridge Handbook of Multimedia Learning* (3rd ed., pp. 381–393). Cambridge University Press. https://doi.org/10.1017/9781108894333.040

Chi, M. T. HM. T., De Leeuw, N., Chiu, M. H., & LaVancher, C. (1994). Eliciting Self-Explanations Improves Understanding. *Cognitive Science*, *18*(3), 439–477.

Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 3–7.

Cho, K., & MacArthur, C. (2010). Student revision with peer and expert reviewing. *Learning and Instruction*, *20*(4), 328–338. https://doi.org/10.1016/j.learninstruc.2009.08.006

Cho, K., & MacArthur, C. (2011). Learning by reviewing. *Journal of Educational Psychology*, *103*(1), 73–84. https://doi.org/10.1037/a0021950

Cho, K., & Schunn, C. D. (2007). Scaffolded writing and rewriting in the discipline: A web-based reciprocal peer review system. *Computers & Education*, *48*(3), 409–426. https://doi.org/10.1016/j.compedu.2005.02.004

Cho, K., Schunn, C. D., & Charney, D. (2006). Commenting on Writing: Typology and Perceived Helpfulness of Comments from Novice Peer Reviewers and Subject Matter Experts. *Written Communication*, *23*(3), 260–294. https://doi.org/10.1177/0741088306289261

Cho, Y. H., & Cho, K. (2011). Peer reviewers learn from giving comments. *Instructional Science*, *39*(5), 629–643. https://doi.org/10.1007/s11251-010-9146-1

Choy, L. T. (2014). The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches. *IOSR Journal of Humanities and Social Science*, *19*(4), 99–104. https://doi.org/10.9790/0837-194399104

Chyung, S. Y. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-Based Survey Design: The Use of a Midpoint on the Likert Scale. *Performance Improvement*, *56*(10), 15–23. https://doi.org/10.1002/pfi.21727

Ciani, K. D., & Sheldon, K. M. (2010). Evaluating the mastery-avoidance goal construct: A study of elite college baseball players. *Psychology of Sport and Exercise*, 6.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences / Jacob Cohen.* (2nd ed.). L. Erlbaum Associates.

Credé, M., & Phillips, L. A. (2011). A meta-analytic review of the Motivated Strategies for Learning Questionnaire. *Learning and Individual Differences*, *21*(4), 337–346. https://doi.org/10.1016/j.lindif.2011.03.002

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches / John W. Creswell.* (3rd ed.). SAGE Publications.

Crisp, B. R. (2007). Is it worth the effort? How feedback influences students' subsequent submission of assessable work. *Assessment & Evaluation in Higher Education*, *32*(5), 571–581. https://doi.org/10.1080/02602930601116912

Cristobal, E., Flavián, C., & Guinalíu, M. (2007). Perceived e-service quality (PeSQ): Measurement validation and effects on consumer satisfaction and web site loyalty. *Managing Service Quality: An International Journal*, *17*(3), 317–340.

Davies, P. (2000). Computerized Peer Assessment. *Innovations in Education and Training International*, *37*(4), 346–355. https://doi.org/10.1080/135580000750052955

Davies, P. (2004). Don't write, just mark: The validity of assessing student ability via their computerized peer-marking of an essay rather than their creation of an essay. *Research in Learning Technology*, *12*(3). https://doi.org/10.3402/rlt.v12i3.11258

Davies, P. (2006). Peer assessment: Judging the quality of students' work by comments rather than marks. *Innovations in Education and Teaching International*, *43*(1), 69–82. https://doi.org/10.1080/14703290500467566

De Wever, B., Schellens, T., Valcke, M., & Van Keer, H. (2006). Content analysis schemes to analyze transcripts of online asynchronous discussion groups: A review. *Computers & Education*, *46*(1), 6–28. https://doi.org/10.1016/j.compedu.2005.04.005

Defnition and Terminology Committee of the Association, for Educational Communications and Technology, & for Educational Communications and Technology. (2007). Chapter 1 Definition. In A. Januszewski & M. Molenda (Eds.), *Educational Technology: A Definition with Commentary* (2nd ed). Taylor and Francis.

Dieterich, D. (1976). Response to Richard Beach, "Self-Evaluation Strategies of Extensive Revisers and Nonrevisers." *College Composition and Communication*, *27*(3), 301. https://doi.org/10.2307/357062

Dochy, F., Segers, M., & Sluijsmans, D. (1999). The use of self-, peer and co-assessment in higher education: A review. *Studies in Higher Education*, *24*(3), 331–350. https://doi.org/10.1080/03075079912331379935

Duijnhouwer, H., Prins, F. J., & Stokking, K. M. (2012). Feedback providing improvement strategies and reflection on feedback use: Effects on students' writing motivation, process, and performance. *Learning and Instruction*, *22*(3), 171–184. https://doi.org/10.1016/j.learninstruc.2011.10.003

Dunn, D. S., Saville, B. K., Baker, S. C., & Marek, P. (2013). Evidence-based teaching: Tools and techniques that promote learning in the psychology classroom. *Australian Journal of Psychology*, *65*(1), 5–13. https://doi.org/10.1111/ajpy.12004

Durst, R. K., & Newell, G. E. (1989). The Uses of Function: James Britton's Category System and Research on Writing. *Review of Educational Research*, *59*(4), 375–394. https://doi.org/10.3102/00346543059004375

Elliot, A. J., & McGregor, H. A. (2001). A 2 X 2 achievement goal framework. *Journal of Personality and Social Psychology*, *80*(3), 501–519. https://doi.org/10.1037/0022-3514.80.3.501

Elliot, A. J., & Murayama, K. (2008). On the measurement of achievement goals: Critique, illustration, and application. *Journal of Educational Psychology*, *100*(3), 613–628. https://doi.org/10.1037/0022-0663.100.3.613

Ellman, N. (1975). Peer Evaluation and Peer Grading. *The English Journal*, *64*(3), 79. https://doi.org/10.2307/815059

Emig, J. (1977). Writing as a mode of Learning. *College Composition and Communication*, *28*, 8.

Ene, E., & Upton, T. A. (2014). Learner uptake of teacher electronic feedback in ESL composition. *System*, *46*, 80–95. https://doi.org/10.1016/j.system.2014.07.011

Er, E., Dimitriadis, Y., & Gašević, D. (2020). A collaborative learning approach to dialogic peer feedback: A theoretical framework. *Assessment & Evaluation in Higher Education*, 1–15. https://doi.org/10.1080/02602938.2020.1786497

Evans, C. (2013). Making Sense of Assessment Feedback in Higher Education. *Review of Educational Research*, *83*(1), 70–120. https://doi.org/10.3102/0034654312474350

Faigley, L., & Witte, S. (1981). Analyzing Revision. *College Composition and Communication*, *32*(4), 400. https://doi.org/10.2307/356602

Falchikov, N. (2004). Involving students in assessment. *Psychology Learning & Teaching*, *3*(2), 102–108.

Falchikov, N. (2005). *Improving Assessment Through Student Involvement: Practical Solutions for Aiding Learning in Higher and Further Education*. 305.

Falchikov, N., & Goldfinch, J. (2000). Student Peer Assessment in Higher Education: A Meta-Analysis Comparing Peer and Teacher Marks. *Review of Educational Research*, *70*(3), 287. https://doi.org/10.2307/1170785

Ferris, D. R. (1997). The Influence of Teacher Commentary on Student Revision. *TESOL Quarterly*, *31*(2), 315. https://doi.org/10.2307/3588049

Ferris, D. R. (2004). The "Grammar Correction" Debate in L2 Writing: Where are we, and where do we go from here? (and what do we do in the meantime …?). *Journal of Second Language Writing*, *13*(1), 49–62. https://doi.org/10.1016/j.jslw.2004.04.005

Filius, R. M., de Kleijn, R. A. M., Uijl, S. G., Prins, F. J., Van Rijen, H. V. M., & Grobbee, D. E. (2018). Strengthening dialogic peer feedback aiming for deep learning in SPOCs. *Computers & Education*, *125*, 86–100. https://doi.org/10.1016/j.compedu.2018.06.004

Fiorella, L., & Mayer, R. E. (2021). The Generative Activity Principle in Multimedia Learning. In R. E. Mayer & L. Fiorella (Eds.), *The Cambridge Handbook of Multimedia Learning* (3rd ed., pp. 339–350). Cambridge University Press. https://doi.org/10.1017/9781108894333.036

Fitzgerald, J. (1987). Research on Revision in Writing. *Review of Educational Research*, *57*(4), 26.

Flower, L. S., & Hayes, J. R. (1977). Problem-Solving Strategies and the Writing Process. *College English*, *39*(4), 449. https://doi.org/10.2307/375768

Fram, S. M. (2013). *The Constant Comparative Analysis Method Outside of Grounded Theory*. 26.

Fraser, B. J., Walberg, H. J., Welch, W. W., & Hattie, J. A. (1987). Identifying the Salient Facets of a Model of Student Learning: A Synthesis of Meta Analyses. *International Journal of Educational Research*, *11*(2), p.187-210.

Fry, S. W., & Villagomez, A. (2012). Writing to Learn: Benefits and Limitations. *College Teaching*, *60*(4), 170–175. https://doi.org/10.1080/87567555.2012.697081

Garland, R. (1991). The mid-point on a rating scale: Is it desirable? *Marketing Bulletin*, *2*(1), 66–70.

Georgountzou, A., & Calfoglou, C. (2019). *Peer feedback processes in Distance Education: The giver-receiver experience*. 29.

Gibbs, G., & Simpson, C. (2002). Does your assessment support your students' learning. *Journal of Teaching and Learning in Higher Education*, *1*(1), 1–30.

Gibbs, G., & Simpson, C. (2004). Conditions Under Which Assessment Supports Students' Learning. *Learning and Teaching in Higher Education*, *1*, 29.

Gielen, M., & De Wever, B. (2015). Scripting the role of assessor and assessee in peer assessment in a wiki environment: Impact on peer feedback quality and product improvement. *Computers & Education*, *88*, 370–386. https://doi.org/10.1016/j.compedu.2015.07.012

Gielen, S., Dochy, F., & Onghena, P. (2011). An inventory of peer assessment diversity. *Assessment & Evaluation in Higher Education*, *36*(2), 137–155. https://doi.org/10.1080/02602930903221444

Gielen, S., Peeters, E., Dochy, F., Onghena, P., & Struyven, K. (2010). Improving the effectiveness of peer feedback for learning. *Learning and Instruction*, *20*(4), 304–315. https://doi.org/10.1016/j.learninstruc.2009.08.007

Gielen, S., Tops, L., Dochy, F., Onghena, P., & Smeets, S. (2010). A comparative study of peer and teacher feedback and of various peer feedback forms in a secondary school writing curriculum. *British Educational Research Journal*, *36*(1), 143–162. https://doi.org/10.1080/01411920902894070

Glaser, B. G., & Strauss, A. L. (1999). The Constant Comparative Method of Qualitative Analysis. In *Discovery of Grounded Theory* (p. 16). Routledge. https://doi-org.proxy.lib.sfu.ca/10.4324/9780203793206

Goetz, J. P., & LeCompte, M. D. (1981). Ethnographic Research and the Problem of Data Reduction. *Anthropology & Education Quarterly*, *12*(1), 51–70. https://doi.org/10.1525/aeq.1981.12.1.05x1283i

Graham, S., & Hebert, M. (2011). Writing to Read: A Meta-Analysis of the Impact of Writing and Writing Instruction on Reading. *Harvard Educational Review*, *81*(4), 710–744. https://doi.org/10.17763/haer.81.4.t2k0m13756113566

Graham, S., & Perin, D. (2007). *Writing Next: Effective Strategies to Improve Writing of Adolescents in Middle and High Schools*. Alliance of Excellent Education.

Graham, S., & R. Harris, K. (2000). The Role of Self-Regulation and Transcription Skills in Writing and Writing Development. *Educational Psychologist*, *35*(1), 3–12. https://doi.org/10.1207/S15326985EP3501_2

Hamer, J., Purchase, H., Luxton-Reilly, A., & Denny, P. (2015). A comparison of peer and tutor feedback. *Assessment & Evaluation in Higher Education*, *40*(1), 151–164. https://doi.org/10.1080/02602938.2014.893418

Hamilton, L., & Corbett-Whittier, C. (2020). Defining Case Study in Education Research. In pages 1-2, *Using Case Study in Education Research* (pp. 3–21). SAGE Publications Ltd. https://doi.org/10.4135/9781473913851

Handley, K., Price, M., & Millar, J. (2011a). Beyond 'doing time': Investigating the concept of student engagement with feedback. *Oxford Review of Education*, *37*(4), 543–560. https://doi.org/10.1080/03054985.2011.604951

Handley, K., Price, M., & Millar, J. (2011b). Beyond 'doing time': Investigating the concept of student engagement with feedback. *Oxford Review of Education*, *37*(4), 543–560. https://doi.org/10.1080/03054985.2011.604951

Hanlon, N., Murray, D., & Niculae, E. (2020). *Student Peer Feedback and Assessment in Higher Education*. 9.

Hanrahan, S. J., & Isaacs, G. (2001). Assessing Self- and Peer-assessment: The students' views. *Higher Education Research & Development*, *20*(1), 53–70. https://doi.org/10.1080/07294360123776

Harris, L. R., Brown, G. T. L., & Harnett, J. A. (2014). Understanding classroom feedback practices: A study of New Zealand student experiences, perceptions, and emotional responses. *Educational Assessment, Evaluation and Accountability*, *26*(2), 107–133. https://doi.org/10.1007/s11092-013-9187-5

Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Haughney, K., Wakeman, S., & Hart, L. (2020). Quality of Feedback in Higher Education: A Review of Literature. *Education Sciences*, *10*(3), 60. https://doi.org/10.3390/educsci10030060

Hayes, J., & Flower, L. (1980). Identifying the organization of writing processes. In L. Gregg & E. Steinberg (Eds.), *Cognitive processes in writing: An interdisciplinary approach* (pp. 3-citation_lastpage).

Hayes, J. R. (2000). A New Framework for Understanding Cognition and Affect in Writing. In R. Indrisano & J. R. Squire (Eds.), *Perspectives on Writing: Research, Theory, and Practice* (p. 28). International Reading Association.

Hayes, J. R. (2012). Modeling and Remodeling Writing. *Written Communication*, *29*(3), 369–388. https://doi.org/10.1177/0741088312451260

Hayes, J. R., Flower, L., Schriver, K. A., Stratman, J. F., & Carey, L. (1987). *Cognitive processes in revision (1987)*. 67.

Holliway, D. R. (2004). Through the Eyes of My Reader: A Strategy for Improving Audience Perspective in Children's Descriptive Writing. *Journal of Research in Childhood Education*, *18*(4), 334–349. https://doi.org/10.1080/02568540409595045

Holroyd, C. (2000). Are assessors professional?: Student assessment and the professionalism of academics. *Active Learning in Higher Education*, *1*(1), 28–44. https://doi.org/10.1177/1469787400001001003

Hounsell, D. (1997). Contrasting Conceptions of Essay-writing. *The Experience of Learning*, *2*(1), 10.

Hovardas, T., Tsivitanidou, O. E., & Zacharia, Z. C. (2014). Peer versus expert feedback: An investigation of the quality of peer feedback among secondary school students. *Computers & Education*, *71*, 133–152. https://doi.org/10.1016/j.compedu.2013.09.019

Huisman, B., Saab, N., Van den Broek, P., & Van Driel, J. (2019). The impact of formative peer feedback on higher education students' academic writing: A Meta-Analysis. *Assessment & Evaluation in Higher Education*, *44*(6), 863–880. https://doi.org/10.1080/02602938.2018.1545896

Huisman, B., Saab, N., Van Driel, J., & Van den Broek, P. (2017). Peer feedback on college students' writing: Exploring the relation between students' ability match, feedback quality and essay performance. *Higher Education Research & Development*, *36*(7), 1433–1447. https://doi.org/10.1080/07294360.2017.1325854

Huisman, B., Saab, N., Van Driel, J., & Van den Broek, P. (2018). Peer feedback on academic writing: Undergraduate students' peer feedback role, peer feedback perceptions and essay performance. *Assessment & Evaluation in Higher Education*, *43*(6), 955–968. https://doi.org/10.1080/02602938.2018.1424318

Hyland, P. (2000). Learning from feedback on assessment. In A. Booth & P. Hyland, *The practice of university History Teaching* (pp. 233–247). Manchester University Press.

Jonsson, A. (2013). Facilitating productive use of feedback in higher education. *Active Learning in Higher Education*, *14*(1), 63–76. https://doi.org/10.1177/1469787412467125

Jonsson, A., & Panadero, E. (2018). 24 Facilitating Students' Active Engagement with Feedback. In A. A. Lipnevich & J. K. Smith (Eds.), *The Cambridge handbook of instructional feedback* (pp. 531–553). Cambridge University Press.

Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). Likert Scale: Explored and Explained. *British Journal of Applied Science & Technology*, *7*(4), 396–403. https://doi.org/10.9734/BJAST/2015/14975

Kaarbo, J., & Beasley, R. K. (1999). A Practical Guide to the Comparative Case Study Method in Political Psychology. *Political Psychology*, *20*(2), 369–391. https://doi.org/10.1111/0162-895X.00149

Kang, E., & Han, Z. (2015). The Efficacy of Written Corrective Feedback in Improving L2 Written Accuracy: A Meta-Analysis. *The Modern Language Journal*, *99*(1), 1–18. https://doi.org/10.1111/modl.12189

Kasch, J., Van Rosmalen, P., Löhr, A., Klemke, R., Antonaci, A., & Kalz, M. (2021). Students' perceptions of the peer-feedback experience in MOOCs. *Distance Education*, *42*(1), 145–163. https://doi.org/10.1080/01587919.2020.1869522

Kaufman, J. H., & Schunn, C. D. (2011). Students' perceptions about peer assessment for writing: Their origin and impact on revision work. *Instructional Science*, *39*(3), 387–406. https://doi.org/10.1007/s11251-010-9133-6

Keh, C. L. (1990). Feedback in the writing process: A model and methods for implementation. *ELT Journal*, *44*(4), 294–304. https://doi.org/10.1093/elt/44.4.294

Kieft, Marleen., Rijlaarsdam, Gert., Galbraith, David., & Bergh, Huub. (2007). The effects of adapting a writing course to students' writing strategies. *British Journal of Educational Psychology*, *77*(3), 565–578. https://doi.org/10.1348/096317906X120231

Klein, P. D. (1999). Reopening Inquiry into Cognitive Processes in Writing-To-Learn. *Educational Research Review*, *11*(3), 203–270.

Klein, P. D. (2000). Elementary Students' Strategies for Writing-to-Learn in Science. *Cognition and Instruction*, *18*(3), 317–348. https://doi.org/10.1207/S1532690XCI1803_2

Kluger, A. N., & DeNisi, A. (1996). The Effects of Feedback Interventions on Performance: A Historical Review, a Meta-Analysis, and a Preliminary Feedback Intervention Theory. *Psychological Bulletin*, *119*(2). http://moodle.technion.ac.il/pluginfile.php/76208/mod_resource/content/0/Kluger_and_Denisi.pdf

Kulkarni, C. E., Bernstein, M. S., & Klemmer, S. R. (2015). *PeerStudio: Rapid Peer Feedback Emphasizes Revision and Improves Performance*. 75–84. https://doi.org/10.1145/2724660.2724670

Kulkarni, C., Wei, K. P., Le, H., Chia, D., Papadopoulos, K., Cheng, J., Koller, D., & Klemmer, S. R. (2013). Peer and self assessment in massive online classes. *ACM Transactions on Computer-Human Interaction*, *20*(6), 1–31. https://doi.org/10.1145/2505057

Landis, J. R., & Koch, G. G. (1977). The Measurement of Observer Agreement for Categorical Data. *Biometrics*, *33*(1), 159. https://doi.org/10.2307/2529310

Langer, J. A., & Applebee, A. N. (1987). *How writing shapes thinking: A study of teaching and learning*. National Council of Teachers of English.

Laurillard, D. (1993). The complexity of coming to knwo. In *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies* (2nd ed., pp. 41–61). Taylor & Francis Group.

Leech, N. L., & Onwuegbuzie, A. J. (2011). Beyond constant comparison qualitative data analysis: Using NVivo. *School Psychology Quarterly*, *26*(1), 70–84. https://doi.org/10.1037/a0022711

Li, H., Xiong, Y., Zang, X., L. Kornhaber, M., Lyu, Y., Chung, K. S., & K. Suen, H. (2016). Peer assessment in the digital age: A meta-analysis comparing peer and teacher ratings. *Assessment & Evaluation in Higher Education*, *41*(2), 245–264. https://doi.org/10.1080/02602938.2014.999746

Li, J., & De Luca, R. (2014). Review of assessment feedback. *Studies in Higher Education*, *39*(2), 378–393. https://doi.org/10.1080/03075079.2012.709494

Li, L., Liu, X., & Steckelberg, A. L. (2010). Assessor or assessee: How student learning improves by giving and receiving peer feedback. *British Journal of Educational Technology*, *41*(3), 525–536. https://doi.org/10.1111/j.1467-8535.2009.00968.x

Li, L., Steckelberg, A., & Srinivasan, S. (2008). Utilizing peer interactions to promote learning through a web-based peer assessment system. *Canadian Journal of Learning and Technology/La Revue Canadienne de l'apprentissage et de La Technologie*, *34*(2).

Lin, S. S. J., Liu, E. Z. F., & Yuan, S. M. (2001). Web-based peer assessment: Feedback for students with various thinking-styles: Web-based peer assessment. *Journal of Computer Assisted Learning*, *17*(4), 420–432. https://doi.org/10.1046/j.0266-4909.2001.00198.x

Lincoln, Y. S., & Guba, E. G. (1985). Processing Naturalistically Obtained Data. In *Naturalistic inquiry / Yvonna S. Lincoln, Egon G. Guba.* Sage Publications.

Lipnevich, A. A., Berg, D. A. G., & Smith, J. K. (2016). Toward a Model of Student Response to Feedback. In G. Brown & L. Harris (Eds.), *Handbook of Human and Social Conditions in Assessment* (1st ed.). Routledge. https://doi.org/10.4324/9781315749136

Liu, E. Z.-F., & Lee, C.-Y. (2013). USING PEER FEEDBACK TO IMPROVE LEARNING VIA ONLINE PEER ASSESSMENT. *The Turkish Online Journal of Educational Technology*, *12*(1), 13.

Liu, N.-F., & Carless, D. (2006). Peer feedback: The learning element of peer assessment. *Teaching in Higher Education*, *11*(3), 279–290. https://doi.org/10.1080/13562510600680582

Liu, X., & Li, L. (2014). Assessment training effects on student assessment skills and task performance in a technology-facilitated peer assessment. *Assessment & Evaluation in Higher Education*, *39*(3), 275–292. https://doi.org/10.1080/02602938.2013.823540

Loeb, S., Dynarski, S., McFarland, D., Morris, P., Reardon, S., & Reber, S. (2017). *Descriptive Analysis in Education: A Guide for Researchers. NCEE 2017-4023*. National Center for Education Evaluation and Regional Assistance.

Looney, J. W. (2011). *Integrating formative and summative assessment: Progress toward a seamless system?*

Loureiro, M. J., Pombo, L., & Moreira, A. (2012). The quality of peer assessment in a wiki-based online context: A qualitative study. *Educational Media International*, *49*(2), 139–149. https://doi.org/10.1080/09523987.2012.703426

Lu, J., & Law, N. (2012). Online peer assessment: Effects of cognitive and affective feedback. *Instructional Science*, *40*(2), 257–275. https://doi.org/10.1007/s11251-011-9177-2

Lu, R., & Bol, L. (2007). *A Comparison of Anonymous Versus Identifiable E-Peer Review On College Student Writing Performance and the Extent of Critical Feedback*. 17.

Lundstrom, K., & Baker, W. (2009). To give is better than to receive: The benefits of peer review to the reviewer's own writing. *Journal of Second Language Writing*, *18*(1), 30–43. https://doi.org/10.1016/j.jslw.2008.06.002

Mao, Z., & Lee, I. (2020). Feedback scope in written corrective feedback: Analysis of empirical research in L2 contexts. *Assessing Writing*, *45*, 100469. https://doi.org/10.1016/j.asw.2020.100469

Mayer, R. E., & Fiorella, L. (2022). *The Cambridge Handbook of Multimedia Learning* (3rd ed.). Cambridge University Press. https://doi.org/10.1017/9781108894333

Maykut, P., & Morehouse, R. (1994). Qualitative Data Analysis: Using the Constant Comparative Method. In *Beginning Qualitative Research* (p. 22). Routledge.

McConlogue, T. (2015). Making judgements: Investigating the process of composing and receiving peer feedback. *Studies in Higher Education*, *40*(9), 1495–1506. https://doi.org/10.1080/03075079.2013.868878

McCune, V. (2004). Development of first-year students' conceptions of essay writing. *Higher Education*, *47*(3), 257–282. https://doi.org/10.1023/B:HIGH.0000016419.61481.f9

McCutchen, D., Teske, P., & Bankston, C. (2008). Writing and Cognition: Implications of the Cognitive Architecture for Learning to Write and Writing to Learn. In C. Bazerman (Ed.), *Handbook of research on writing: History, society, school, individual, text* (pp. 451–470). Taylor & Francis Group/Lawrence Erlbaum Associates.

Merriam, S. B. (1998). *Qualitative research and case study applications in education / Sharan B. Merriam.* (2nd ed.). Jossey-Bass.

Min, H.-T. (2003). Why Peer Comments Fail. *English Teaching & Learning*, *27*(3), 85–103.

Min, H.-T. (2005). Training students to become successful peer reviewers. *System*, *33*(2), 293–308. https://doi.org/10.1016/j.system.2004.11.003

Mulder, R., Baik, C., Naylor, R., & Pearce, J. (2014). How does student peer review influence perceptions, engagement and academic outcomes? A case study. *Assessment & Evaluation in Higher Education*, *39*(6), 657–677. https://doi.org/10.1080/02602938.2013.860421

Narciss, S. (2004). The Impact of Informative Tutoring Feedback and Self-Efficacy on Motivation and Achievement in Concept Learning. *Experimental Psychology*, *51*(3), 214–228. https://doi.org/10.1027/1618-3169.51.3.214

Nelson, G. L., & Murphy, J. M. (1993). Peer Response Groups: Do L2 Writers Use Peer Comments in Revising Their Drafts? *TESOL Quarterly*, *27*(1), 135. https://doi.org/10.2307/3586965

Nelson, M. M., & Schunn, C. D. (2009). The nature of feedback: How different types of peer feedback affect writing performance. *Instructional Science*, *37*(4), 375–401. https://doi.org/10.1007/s11251-008-9053-x

Nevid, J. S., Pastva, A., & McClelland, N. (2012). Writing-to-Learn Assignments in Introductory Psychology: Is There a Learning Benefit? *Teaching of Psychology*, *39*(4), 272–275. https://doi.org/10.1177/0098628312456622

Newell, G. E. (1984). Learning from Writing in Two Content Areas: A Case Study/Protocol Analysis. *Research in the Teaching of English*, *18*(3), 24.

Nicol, D. (2009). GOOD DESIGNS FOR WRITTEN FEEDBACK FOR STUDENTS. *New York*, 13.

Nicol, D. (2010). From monologue to dialogue: Improving written feedback processes in mass higher education. *Assessment & Evaluation in Higher Education*, *35*(5), 501–517. https://doi.org/10.1080/02602931003786559

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, *31*(2), 199–218. https://doi.org/10.1080/03075070600572090

Nicol, D., Thomson, A., & Breslin, C. (2014). Rethinking feedback practices in higher education: A peer review perspective. *Assessment & Evaluation in Higher Education*, *39*(1), 102–122. https://doi.org/10.1080/02602938.2013.795518

Orsmond, P., & Merry, S. (2013). The importance of self-assessment in students' use of tutors' feedback: A qualitative study of high and non-high achieving biology undergraduates. *Assessment & Evaluation in Higher Education*, *38*(6), 737–753. https://doi.org/10.1080/02602938.2012.697868

Orsmond, P., Merry, S., & Reiling, K. (1996). The Importance of Marking Criteria in the Use of Peer Assessment. *Assessment & Evaluation in Higher Education*, *21*(3), 239–250. https://doi.org/10.1080/0260293960210304

Orsmond, P., Merry, S., & Reiling, K. (2002). The Use of Exemplars and Formative Feedback when Using Student Derived Marking Criteria in Peer and Self-assessment. *Assessment & Evaluation in Higher Education*, *27*(4), 309–323. https://doi.org/10.1080/0260293022000001337

Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford University Press.

Pajares, F. (2003). SELF-EFFICACY BELIEFS, MOTIVATION, AND ACHIEVEMENT IN WRITING: A REVIEW OF THE LITERATURE. *Reading & Writing Quarterly*, *19*(2), 139–158. https://doi.org/10.1080/10573560308222

Pajares, F., & Johnson, M. J. (1994). Confidence and competence in writing: The role of self-efficacy, outcome expectancy, and apprehension. *Research in the Teaching of English*, 313–331.

Panadero, E., & Alqassab, M. (2019). An empirical review of anonymity effects in peer assessment, peer feedback, peer review, peer evaluation and peer grading. *Assessment & Evaluation in Higher Education*, *44*(8), 1253–1278. https://doi.org/10.1080/02602938.2019.1600186

Patchan, M. M., Charney, D., & Schunn, C. D. (2009). A validation study of students' end comments: Comparing comments by students, a writing instructor, and a content instructor. *Journal of Writing Research*, *1*(2), 124–152. https://doi.org/10.17239/jowr-2009.01.02.2

Patchan, M. M., Hawk, B., Stevens, C. A., & Schunn, C. D. (2013). The effects of skill diversity on commenting and revisions. *Instructional Science*, *41*(2), 381–405. https://doi.org/10.1007/s11251-012-9236-3

Patchan, M. M., & Schunn, C. D. (2015). Understanding the benefits of providing peer feedback: How students respond to peers' texts of varying quality. *Instructional Science*, *43*(5), 591–614. https://doi.org/10.1007/s11251-015-9353-x

Patchan, M. M., & Schunn, C. D. (2016). Understanding the benefits of receiving peer feedback: A case of matching ability in peer-review. *Journal of Writing Research*, *8*(2), 227–265. https://doi.org/10.17239/jowr-2016.08.02.03

Patchan, M. M., Schunn, C. D., & Correnti, R. J. (2016). The nature of feedback: How peer feedback features affect students' implementation rate and quality of revisions. *Journal of Educational Psychology*, *108*(8), 1098–1120. https://doi.org/10.1037/edu0000103

Patton, C. (2012). 'Some kind of weird, evil experiment': Student perceptions of peer assessment. *Assessment & Evaluation in Higher Education*, *37*(6), 719–731. https://doi.org/10.1080/02602938.2011.563281

Perl, S. (1979). The composing processes of unskilled college writers. *Research in the Teaching of English*, *13*(4), 317–336.

Pianko, S. (1979). A Description of the Composing Processes of College Freshman Writers. *Research in the Teaching of English*, *13*(1), 5–22.

Pintrich, P. R., Smith, D. A. F., García, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*.

Pope, N. (2001). An Examination of the Use of Peer Rating for Formative Assessment in the Context of the Theory of Consumption Values. *Assessment & Evaluation in Higher Education*, *26*(3), 235–246. https://doi.org/10.1080/02602930120052396

Poulos, A., & Mahony, M. J. (2008). Effectiveness of feedback: The students' perspective. *Assessment & Evaluation in Higher Education*, *33*(2), 143–154.

Price, M., Handley, K., Millar, J., & O'Donovan, B. (2010). Feedback: All that effort, but what is the effect? *Assessment & Evaluation in Higher Education*, *35*(3), 277–289. https://doi.org/10.1080/02602930903541007

Prins, F. J., Sluijsmans, D. M. A., & Kirschner, P. A. (2006). Feedback for General Practitioners in Training: Quality, Styles, and Preferences. *Advances in Health Sciences Education*, *11*(3), 289–303. https://doi.org/10.1007/s10459-005-3250-z

Purdue OWL staff. (n.d.). *Peer Review: Looking at Texts from a Reader's Perspective*. Purdue Online Writing Lab. https://owl.purdue.edu/owl/teacher_and_tutor_resources/teaching_resources/peer_review_presentation.html

QSR International. (n.d.). *Run a Word Frequency query*. NVivo 11 for Windows Help. http://help-nv11.qsrinternational.com/desktop/procedures/run_a_word_frequency_query.htm

Reid, J., & Kroll, B. (1995). Designing and Assessing Effective Classroom Writing Assignments for NES and ES1 Students. *Journal of Second Language Writing*, *4*(1), 25.

Rittle-Johnson, B., Loehr, A. M., & Durkin, K. (2017). Promoting self-explanation to improve mathematics learning: A meta-analysis and instructional design principles. *ZDM*, *49*(4), 599–611. https://doi.org/10.1007/s11858-017-0834-z

Sadler, D. R. (2010). Beyond feedback: Developing student capability in complex appraisal. *Assessment & Evaluation in Higher Education*, *35*(5), 535–550. https://doi.org/10.1080/02602930903541015

Sadler, P., & Good, E. (2006). The Impact of Self- and Peer-Grading on Student Learning. *Educational Assessment*, *11*(1), 1–31. https://doi.org/10.1207/s15326977ea1101_1

Sánchez Rosas, J. (2015). Validation of the achievement goal questionnaire – revised in Argentinean university students (A-AGQ-R). *International Journal of Psychological Research*, *8*(1), 10–23. https://doi.org/10.21500/20112084.641

Scouller, K. (1998). The influence of assessment method on students' learning approaches: Multiple choice question examination versus assignment essay. *Higher Education*, *35*, 20.

Senko, C., & Freund, A. M. (2015). Are mastery-avoidance achievement goals always detrimental? An adult development perspective. *Motivation and Emotion*, *39*(4), 477–488. https://doi.org/10.1007/s11031-015-9474-1

Shell, D. F., Bruning, R. H., & Murphy, C. C. (1989). Self-Efficacy and Outcome Expectancy Mechanisms in Reading andWriting Achievement. *Journal of Educational Psychology*, *81*(1).

Shute, V. J. (2008). Focus on Formative Feedback. *Review of Educational Research*, *78*(1), 153–189.

Simon Fraser University. (n.d.). *Instructional Psychology*. Student Services Spring Calendar. https://www.sfu.ca/students/calendar/2022/spring/courses/educ/320.html

Simons, H. (2009). *Case Study Research in Practice*. SAGE Publications, Ltd. https://doi.org/10.4135/9781446268322

Slomp, D. H. (2012). Challenges in assessing the development of writing ability: Theories, constructs and methods. *Assessing Writing*, *17*(2), 81–91. https://doi.org/10.1016/j.asw.2012.02.001

Sluijsmans, D. M. A. (2002). *Student involvement in assessment. The training of peer assessment skills* [Open University of the Netherlands]. https://www.researchgate.net/publication/254894460_Student_involvement_in_assessment_The_training_of_peer_assessment_skills

Sluijsmans, D. M. A., Brand-Gruwel, S., & Van Merriënboer, J. J. G. (2002). Peer Assessment Training in Teacher Education: Effects on performance and perceptions. *Assessment & Evaluation in Higher Education*, *27*(5), 443–454. https://doi.org/10.1080/0260293022000009311

Smith, J. K., Berg, D., Kendall-Smith, M., & Lipnevich, A. A. (2013). *Response to feedback: How we perceive what we receive*. Paper presented at annual meeting of the New Zealand Association for Research in Education, Dunedin, NZ.

Sommers, N. (1980). Revision Strategies of Student Writers and Experienced Adult Writers. *College Composition and Communication*, *31*(4), 378. https://doi.org/10.2307/356588

Stake, R. E. (1995). *The Art of Case Study Research*. SAGE Publications. https://books.google.ca/books?id=ApGdBx76b9kC

Stewart, T. L., Myers, A. C., & Culley, M. R. (2010). Enhanced Learning and Retention through "Writing to Learn" in the Psychology Classroom. *Teaching of Psychology*, *37*(1), 46–49. https://doi.org/10.1080/00986280903425813

Strauss, A., Corbin, J. M., & SAGE. (1990). *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. SAGE Publications. https://books.google.ca/books?id=nvwOAQAAMAAJ

Strijbos, J.-W., Martens, R. L., Prins, F. J., & Jochems, W. M. G. (2006). Content analysis: What are they talking about? *Computers & Education*, *46*(1), 29–48. https://doi.org/10.1016/j.compedu.2005.04.002

Strijbos, J.-W., Narciss, S., & Dünnebier, K. (2010). Peer feedback content and sender's competence level in academic writing revision tasks: Are they critical for feedback perceptions and efficiency? *Learning and Instruction*, *20*(4), 291–303. https://doi.org/10.1016/j.learninstruc.2009.08.008

Taras, M. (2005). Assessment – Summative and Formative – Some Theoretical Reflections. *British Journal of Educational Studies*, *53*(4), 466–478. https://doi.org/10.1111/j.1467-8527.2005.00307.x

Thanh, P. T. H., & Gillies, R. (2010). Designing a Culturally Appropriate Format of Formative Peer Assessment for Asian Students: The Case of Vietnamese Students. *International Journal of Educational Reform*, *19*(2), 72–85.

Thomas, G. (2011). A Typology for the Case Study in Social Science Following a Review of Definition, Discourse, and Structure. *Qualitative Inquiry*, *17*(6), 511–521. https://doi.org/10.1177/1077800411409884

Topping, K. (1998). Peer Assessment between Students in Colleges and Universities. *Review of Educational Research*, *68*(3), 249. https://doi.org/10.2307/1170598

Topping, K. J. (2005). Trends in Peer Learning. *Educational Psychology*, *25*(6), 631–645. https://doi.org/10.1080/01443410500345172

Topping, K. J. (2009). Peer Assessment. *Theory Into Practice*, *48*(1), 20–27. https://doi.org/10.1080/00405840802577569

Topping, K. J. (2010). Methodological quandaries in studying process and outcomes in peer assessment. *Learning and Instruction*, *20*(4), 339–343. https://doi.org/10.1016/j.learninstruc.2009.08.003

Topping, K. J. (2017). Peer Assessment: Learning by Judging and Discussing the Work of Other Learners. *Interdisciplinary Education and Psychology*, *1*(1). https://doi.org/10.31532/InterdiscipEducPsychol.1.1.007

Topping, K. J., Smith, E. F., Swanson, I., & Elliot, A. (2000). Formative Peer Assessment of Academic Writing Between Postgraduate Students. *Assessment & Evaluation in Higher Education*, *25*(2), 149–169. https://doi.org/10.1080/713611428

Truscott, J. (1996). The Case Against Grammar Correction in L2 Writing Classes. *Language Learning*, *46*(2), 327–369. https://doi.org/10.1111/j.1467-1770.1996.tb01238.x

Tsai, C.-C., & Liang, J.-C. (2009). The development of science activities via on-line peer assessment: The role of scientific epistemological views. *Instructional Science*, *37*(3), 293–310. https://doi.org/10.1007/s11251-007-9047-0

Tsai, C.-C., Lin, S. S. J., & Yuan, S.-M. (2002). Developing science activities through a networked peer assessment system. *Computers & Education*, *38*(1–3), 241–252. https://doi.org/10.1016/S0360-1315(01)00069-0

Tseng, S.-C., & Tsai, C.-C. (2007). On-line peer assessment and the role of the peer feedback: A study of high school computer course. *Computers & Education*, *49*(4), 1161–1174. https://doi.org/10.1016/j.compedu.2006.01.007

Tsui, A. B. M., & Ng, M. (2000). Do Secondary L2 Writers Benefit from Peer Comments? *Journal of Second Language Writing*, *9*(2), 147–170. https://doi.org/10.1016/S1060-3743(00)00022-9

University of Melbourne. (n.d.). *Teaching Resources | Student Peer Review*. Retrieved June 14, 2017, from http://peerreview.cis.unimelb.edu.au/resources-3/teaching-resources-2/

Van den Berg, I., Admiraal, W., & Pilot, A. (2006). Designing student peer assessment in higher education: Analysis of written and oral peer feedback. *Teaching in Higher Education*, *11*(2), 135–147. https://doi.org/10.1080/13562510500527685

Van den Bos, A. H., & Tan, E. (2019). Effects of anonymity on online peer review in second-language writing. *Computers & Education*, *142*, 103638. https://doi.org/10.1016/j.compedu.2019.103638

Van der Pol, J., Van den Berg, B. A. M., Admiraal, W. F., & Simons, P. R. J. (2008). The nature, reception, and use of online peer feedback in higher education. *Computers & Education*, *51*(4), 1804–1817. https://doi.org/10.1016/j.compedu.2008.06.001

Van Gennip, N. A. E., Segers, M. S. R., & Tillema, H. H. (2009). Peer assessment for learning from a social perspective: The influence of interpersonal variables and structural features. *Educational Research Review*, *4*(1), 41–54. https://doi.org/10.1016/j.edurev.2008.11.002

Van Steendam, E., Rijlaarsdam, G., Sercu, L., & Van den Bergh, H. (2010). The effect of instruction type and dyadic or individual emulation on the quality of higher-order peer feedback in EFL. *Learning and Instruction*, *20*(4), 316–327. https://doi.org/10.1016/j.learninstruc.2009.08.009

VanLehn, K., Chi, M. T. H., Baggett, W., & Murray, R. C. (1995). *Progress Report: Towards a theory of learning during tutoring*. PITTSBURGH UNIV PA LEARNING RESEARCH AND DEVELOPMENT CENTER.

Voet, M., Gielen, M., Boelens, R., & De Wever, B. (2018). Using feedback requests to actively involve assessees in peer assessment: Effects on the assessor's feedback content and assessee's agreement with feedback. *European Journal of Psychology of Education*, *33*(1), 145–164. https://doi.org/10.1007/s10212-017-0345-x

Vu, T. T., & Dall'Alba, G. (2007). Students' experience of peer assessment in a professional course. *Assessment & Evaluation in Higher Education*, *32*(5), 541–556. https://doi.org/10.1080/02602930601116896

Walker, M. (2009). An investigation into written comments on assignments: Do students find them usable? *Assessment & Evaluation in Higher Education*, *34*(1), 67–78. https://doi.org/10.1080/02602930801895752

Walker, M. (2015). The quality of written peer feedback on undergraduates' draft answers to an assignment, and the use made of the feedback. *Assessment & Evaluation in Higher Education*, *40*(2), 232–247. https://doi.org/10.1080/02602938.2014.898737

Weaver, M. R. (2006). Do students value feedback? Student perceptions of tutors' written responses. *Assessment & Evaluation in Higher Education*, *31*(3), 379–394. https://doi.org/10.1080/02602930500353061

Wen, M. L., & Tsai, C.-C. (2006). University Students' Perceptions of and Attitudes Toward (Online) Peer Assessment. *Higher Education*, *51*(1), 27–44. https://doi.org/10.1007/s10734-004-6375-8

Wiley, J., & Voss, J. F. (1996). The Effects of 'Playing Historian' on Learning in History. *Applied Cognitive Psychology*, *10*(7), 63–72. https://doi.org/10.1002/(SICI)1099-0720(199611)10:7<63::AID-ACP438>3.0.CO;2-5

Wiley, J., & Voss, J. F. (1999). Constructing Arguments From Multiple Sources: Tasks That Promote Understanding and Not Just Memory for Text. *Journal of Educational Psychology*, *91*(2), 301–311.

Winstone, N. E., Nash, R. A., Parker, M., & Rowntree, J. (2017). Supporting Learners' Agentic Engagement With Feedback: A Systematic Review and a Taxonomy of Recipience Processes. *Educational Psychologist*, *52*(1), 17–37. https://doi.org/10.1080/00461520.2016.1207538

Xiao, Y., & Lucking, R. (2008). The impact of two types of peer assessment on students' performance and satisfaction within a Wiki environment. *The Internet and Higher Education*, *11*(3–4), 186–193. https://doi.org/10.1016/j.iheduc.2008.06.005

Yu, F.-Y., & Wu, C.-P. (2013). *Predictive Effects of Online Peer Feedback Types on Performance Quality*. 11.

Zhao, H. (2010). Investigating learners' use and understanding of peer and teacher feedback on writing: A comparative study in a Chinese English writing classroom. *Assessing Writing*, *15*(1), 3–17. https://doi.org/10.1016/j.asw.2010.01.002

Zheng, L., Cui, P., Li, X., & Huang, R. (2018). Synchronous discussion between assessors and assessees in web-based peer assessment: Impact on writing performance, feedback quality, meta-cognitive awareness and self-efficacy. *Assessment & Evaluation in Higher Education*, *43*(3), 500–514. https://doi.org/10.1080/02602938.2017.1370533

Zheng, L., Zhang, X., & Cui, P. (2020). The role of technology-facilitated peer assessment and supporting strategies: A meta-analysis. *Assessment & Evaluation in Higher Education*, *45*(3), 372–386. https://doi.org/10.1080/02602938.2019.1644603

Zimmerman, B. J., & Kitsantas, A. (2002). Acquiring writing revision and self-regulatory skill through observation and emulation. *Journal of Educational Psychology*, *94*(4), 660–668. https://doi.org/10.1037/0022-0663.94.4.660

Appendix A.

Participant Characteristics Questionnaire

Name: _____ Student #: _____

Please answer following questions.

Gender:

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other

Age:

What is your age?

- ☐ Less than 18
- ☐ 18 to 20
- ☐ 21 to 25
- ☐ 26 to 30
- ☐ 31 to 35
- ☐ Over 35

Major:

What is your major?

- ☐ Education
- ☐ Other, please specify _____

Year in school:

What year are you in?

- ☐ 1st year undergraduate
- ☐ 2nd year undergraduate
- ☐ 3rd year undergraduate
- ☐ 4th year undergraduate

- ☐ 5th year undergraduate
- ☐ Graduate or professional
- ☐ Unclassified
- ☐ Other, please specify _____

Language:

What is your first language? Please also indicate the second and the third language which you use frequently.

First language: _____

Second language: _____

Third language: _____

Current GPA:

What is your current GPA?

- ☐ Under 2.00
- ☐ 2.0 – 2.24
- ☐ 2.25 – 2.49
- ☐ 2.5 – 2.99
- ☐ 3.0 – 3.24
- ☐ 3.25 – 3.49
- ☐ 3.50 – 3.75
- ☐ 3.76 – 3.99
- ☐ 4.00 and Higher
- ☐ Don't know

Peer assessment experience:

Have you taken courses which use peer assessment/review?

- ☐ Yes
- ☐ No

If yes, how many times have you taken such course?

_____ times

Appendix B.

Students' Peer Feedback Experience Questionnaire

Thinking about your peer feedback experiences, to what extent do you agree with the following statements? (Check the best response to each statement.)

1 Strongly disagree 2 Disagree 3 Agree 4 Strongly agree 5 Don't know

		1	2	3	4	5
1	The peer feedback is helpful to my learning.					
2	The peer feedback makes me understand more about teacher's requirement.					
3	The peer feedback activities can improve my skills in written communication.					
4	The peer feedback activities help me understand what other classmates think.					
5	The peer feedback activities motivate me to learn.					
6	The peer feedback activities increase the interaction between my teacher and me.					
7	The peer feedback helps me develop a sense of participation.					
8	The peer feedback activities increase the interaction between my classmates and me.					
9	I think students should not be responsible for giving feedback					
10	The teacher should develop criteria of the peer feedback activities for students.					
11	I think the peer feedback is fair to assess students' performance.					
12	Students should participate in the development of criteria for the peer feedback activities.					
13	The peer feedback is time-consuming					
14	My feedback giving to classmates are affected by the feedback given to me					
15	If I receive feedback less helpful than I expected, then I will not try to provide helpful feedback to classmates					
16	Online peer review process can be timesaving					
17	Online peer review process can increase the positive interaction among classmates					
18	Online peer review process can be economical					
19	Online peer review system is a satisfactory system for uploading assignment					

20	Online peer review system is a satisfactory system for downloading assignment					
21	Online peer review system is a satisfactory system for giving feedback					
22	Online peer review system is a satisfactory system for receiving feedback					
23	The Assignment Paper Template helped to receive helpful feedback.					
24	The Assignment Paper Template helped to provide helpful feedback.					
25	I prefer to give feedback on specific paragraphs or sentences using the Tracking tool on MS-Word rather than giving summarized feedback at the end of the essay.					
26	The Helpful Feedback Comment List can be timesaving					
27	The amount of the feedback I received from the peer reviewers is sufficient.					
28	I understand easily the feedback I received from the peer reviewers.					
29	The Helpful Feedback Comment List is helpful to create feedback.					
30	I received more helpful feedback in Assignment 2 than Assignment 1.					
31	I received more helpful feedback in Assignment 3 than the Assignment 2.					
32	Peers may not have adequate knowledge to provide feedback					
33	Peer feedback was often ambiguous or not relevant for further modification					
34	Generally, the feedback that I received is fair					
35	I can give understandable feedback					
36	Giving each other feedback is instructive					
37	I can learn from receiving feedback					
38	For me, receiving feedback from peers is threatening					
39	Generally, the feedback that I received is specific					
40	I can learn from giving feedback					
41	Feedback should be given only by a teacher					
42	Generally, the feedback that I received is helpful					

Sources: Lin, Liu, & Yuan, 2001; Prins, Sluijsmans, & Krishneer, 2006; Wen & Tsai, 2006

Appendix C.

Writing Self-Efficacy Questionnaire

I.

Directions: On a scale from 0 (no chance) to 100 (completely certain), how confident are you of being able to successfully communicate, in writing, what want to say in each of the following writing tasks. You may select any number between 0 and 100.

0 10 20 30 40 50 60 70 80 90 100

No chance completely certain

_____ 1. I write a letter to a friend or family member.
_____ 2. I use instructions for how to play a card game.
_____ 3. I compose a will or other legal document.
_____ 4. I fill out an insurance application.
_____ 5. I write an instruction manual for operating a stereo.
_____ 6. I prepare a resume describing my employment history and skills.
_____ 7. I write a one or two sentence answer to a specific test question.
_____ 8. I compose a one or two page essay in answer to a test question.
_____ 9. I write a term paper of 15 to 20 pages.
_____ 10. I author a scholarly article for publication in a professional journal in my field.
_____ 11. I write a letter to the editor of the daily newspaper.
_____ 12. I compose an article for a popular magazine such as Newsweek.
_____ 13. I author a short fiction story.
_____ 14. I author a novel.
_____ 15. I compose an essay expressing my view on a controversial topic.
_____ 16. I write useful class notes.
_____ 17. I author a children's book.
_____ 18. I prepare lesson plans for an elementary class studying the process of writing.
_____ 19. I write a brief autobiography.
_____ 20. I compose a two-page essay on my philosophy of education.

II.

Directions: On a scale from 0 (no chance) to 100 (completely certain), how confident are you that you can perform each of the following writing skills? You may use any number between 0 and 100.

0 10 20 30 40 50 60 70 80 90 100

No chance completely certain

_____ 1. I correctly spell all words in a one page passage.
_____ 2. I correctly punctuate a one page passage.
_____ 3. I correctly use parts of speech (i.e., nouns, verbs, adjectives, etc.)
_____ 4. I write a simple sentence with proper punctuation and grammatical structure.
_____ 5. I correctly use plurals, verb tenses, prefixes, and suffixes.
_____ 6. I write compound and complex sentences with proper punctuation and grammatical structure.
_____ 7. I organize sentences into a paragraph so as to clearly express a theme.
_____ 8. I write a paper with good overall organization (e.g., ideas in order, effective transitions, etc.)
_____ 9. I can think of many ideas for my writing.
_____ 10. I can put my ideas into writing.
_____ 11. I can think of many words to describe my ideas.
_____ 12. I can think of a lot of original ideas.
_____ 13. I know exactly where to place my ideas in my writing.
_____ 14. I can spell my words correctly.
_____ 15. I can write complete sentences.
_____ 16. I can punctuate my sentences correctly.
_____ 17. I can write grammatically correct sentences.
_____ 18. I can begin my paragraphs in the right spots.
_____ 19. I can focus on my writing for at least one hour.
_____ 20. I can avoid distractions while I write.
_____ 21. I can start writing assignments quickly.
_____ 22. I can control my frustration when I write.
_____ 23. I can think of my writing goals before I write.
_____ 24. I can keep writing even when it's difficult.

Source: Pajares & Johnson, 1994; Bruning, Dempsey, Kauffman, & Zumbrunn, 2013

Appendix D.

Learning Questionnaire

Name: _____ Student ID: _____

Motivation:

The following questions ask about your motivation for and attitudes about this class. Remember there are no right or wrong answers, just answer as accurately as possible. Use the scale below to answer the questions. If you think the statement is very true of you, circle 7; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

1	2	3	4	5	6	7
not at all true of me						very true of me

1	In a class like this, I prefer course material that really challenges me so I can learn new things.	1	2	3	4	5	6	7
2	If I study in appropriate ways, then I will be able to learn the material in this course.	1	2	3	4	5	6	7
3	I think I will be able to use what I learn in this course in other courses.	1	2	3	4	5	6	7
4	I believe I will receive an excellent grade in this class.	1	2	3	4	5	6	7
5	I'm certain I can understand the most difficult material presented in the readings for this course.	1	2	3	4	5	6	7
6	Getting a good grade in this class is the most satisfying thing for me right now.	1	2	3	4	5	6	7

7	It is my own fault if I don't learn the material in this course.	1	2	3	4	5	6	7
8	It is important for me to learn the course material in this class.	1	2	3	4	5	6	7
9	The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	1	2	3	4	5	6	7
10	I'm confident I can understand the basic concepts taught in this course.	1	2	3	4	5	6	7
11	If I can, I want to get better grades in this class than most of the other students.	1	2	3	4	5	6	7
12	I'm confident I can understand the most complex material presented by the instructor in this course.	1	2	3	4	5	6	7
13	In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	1	2	3	4	5	6	7
14	I am very interested in the content area of this course.	1	2	3	4	5	6	7
15	If I try hard enough, then I will understand the course material.	1	2	3	4	5	6	7
16	I'm confident I can do an excellent job on the assignments and tests in this course.	1	2	3	4	5	6	7
17	I expect to do well in this class.	1	2	3	4	5	6	7
18	The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.	1	2	3	4	5	6	7
19	I think the course material in this class is useful for me to learn.	1	2	3	4	5	6	7

20	When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.	1	2	3	4	5	6	7
21	If I don't understand the course material, it is because I didn't try hard enough.	1	2	3	4	5	6	7
22	I like the subject matter of this course.	1	2	3	4	5	6	7
23	Understanding the subject matter of this course is very important to me.	1	2	3	4	5	6	7
24	I'm certain I can master the skills being taught in this class.	1	2	3	4	5	6	7
25	I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.	1	2	3	4	5	6	7
26	Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.	1	2	3	4	5	6	7

Learning Strategies:

The following questions ask about your learning strategies and study skills for this class. Answer the questions about how you study in this class as accurately as possible. Use the same scale to answer the remaining questions. If you think the statement is very true of you, circle 7; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

1	2	3	4	5	6	7
not at all true of me						very true of me

1	During class time I often miss important points because I'm thinking of other things.	1	2	3	4	5	6	7
2	When reading for this course, I make up questions to help focus my reading.	1	2	3	4	5	6	7

3	I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.	1	2	3	4	5	6	7
4	I often find myself questioning things I hear or read in this course to decide if I find them convincing.	1	2	3	4	5	6	7
5	When I become confused about something I'm reading for this class, I go back and try to figure it out.	1	2	3	4	5	6	7
6	If course materials are difficult to understand, I change the way I read the material.	1	2	3	4	5	6	7
7	When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.	1	2	3	4	5	6	7
8	I work hard to do well in this class even if I don't like what we are doing.	1	2	3	4	5	6	7
9	I treat the course material as a starting point and try to develop my own ideas about it.	1	2	3	4	5	6	7
10	Before I study new course material thoroughly, I often skim it to see how it is organized.	1	2	3	4	5	6	7
11	I ask myself questions to make sure I understand the material I have been studying in this class.	1	2	3	4	5	6	7
12	I try to change the way I study in order to fit the course requirements and instructor's teaching style.	1	2	3	4	5	6	7
13	I often find that I have been reading for class but don't know what it was all about.	1	2	3	4	5	6	7
14	When course work is difficult, I give up or only study the easy parts.	1	2	3	4	5	6	7

15	I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying.	1	2	3	4	5	6	7
16	I try to play around with ideas of my own related to what I am learning in this course.	1	2	3	4	5	6	7
17	Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.	1	2	3	4	5	6	7
18	Even when course materials are dull and uninteresting, I manage to keep working until I finish.	1	2	3	4	5	6	7
19	When studying for this course I try to determine which concepts I don't understand well.	1	2	3	4	5	6	7
20	When I study for this class, I set goals for myself in order to direct my activities in each study period.	1	2	3	4	5	6	7
21	If I get confused taking notes in class, I make sure I sort it out afterwards.	1	2	3	4	5	6	7

Achievement Goal:

If you strongly agree with the statement, circle 5. If you strongly disagree with the statement, circle 1. If you think the stamen is more or less true, pick a number between 1 and 5.

1	2	3	4	5
strongly disagree				strongly agree

1	My aim is completely master the material presented in this class.	1	2	3	4	5
2	I am striving to do well compared to other students.	1	2	3	4	5

3	My goal is to learn as much as possible.	1	2	3	4	5
4	My aim is to perform well relative to other students.	1	2	3	4	5
5	My goal is to avoid performing poorly compared to others.	1	2	3	4	5
6	I am striving to understand the content as thoroughly as possible.	1	2	3	4	5
7	My goal is to perform better than the other students.	1	2	3	4	5
8	I am striving to avoid performing worse than others.	1	2	3	4	5
9	My aim is to avoid doing worse than other students.	1	2	3	4	5

Appendix E.

Top 100-word frequency in writers' request comment

Word	Count	Weighted Percentage (%)	Similar Words
theory	92	3.32	theories, theory
description	76	2.75	description, descriptions
video	48	1.73	video, videos
analysis	47	1.70	analysis, analysis'
enough	41	1.48	enough
think	41	1.48	think, thinking
make	39	1.41	make, makes
clear	36	1.30	clear, clearly
correct	30	1.08	correct, correctly
used	30	1.08	use, used, uses, using
detailed	28	1.01	detail, detailed, details
know	28	1.01	know
thank	28	1.01	thank, thanks
feedback	26	0.94	feedback
focus	26	0.94	focus, focused, focuses
need	24	0.87	need, needed, needs
please	24	0.87	please
point	24	0.87	point, points
proposal	24	0.87	proposal, proposing
sure	23	0.83	sure
concerned	22	0.79	concern, concerned, concerns
sense	22	0.79	sense
just	20	0.72	just
paragraph	20	0.72	paragraph, paragraphs
section	20	0.72	section, sections
teacher	20	0.72	teacher, teachers, teachers'
word	20	0.72	word, wording, words
like	19	0.69	like
parts	19	0.69	part, parts
also	18	0.65	also
explain	18	0.65	explain, explained, explaining, explains
ideas	17	0.61	idea, ideas
one	17	0.61	one, ones
specific	17	0.61	specific, specifically
principle	16	0.58	principle, principles
applied	15	0.54	applied, applies, apply, applying
example	15	0.54	example, examples
paper	15	0.54	paper, papers
students	15	0.54	student, students
feel	14	0.51	feel, feels
well	14	0.51	well
whether	14	0.51	whether
write	14	0.51	write, writing
citations	13	0.47	citation, citations
comments	13	0.47	comment, comments
count	13	0.47	count
review	13	0.47	review, reviewer, reviewing
suggestions	13	0.47	suggest, suggestions
want	13	0.47	want, wanted
work	13	0.47	work, working, works

Word	Count	Weighted Percentage (%)	Similar Words
connection	12	0.43	connect, connecting, connection, connects
include	12	0.43	include, included, includes, including
read	12	0.43	read, reading, readings
sentence	12	0.43	sentence, sentences
time	12	0.43	time
add	11	0.40	add
expand	11	0.40	expand, expanded, expanding
flow	11	0.40	flow
grammar	11	0.40	grammar
trying	11	0.40	tried, try, trying
wish	11	0.40	wish
context	10	0.36	context
mention	10	0.36	mention, mentioned
motivation	10	0.36	motivated, motivation
watch	10	0.36	watch, watched, watching
give	9	0.33	give, gives
learning	9	0.33	learned, learning
let	9	0.33	let
missing	9	0.33	miss, missed, missing
overall	9	0.33	overall
reader	9	0.33	reader
still	9	0.33	still
anything	8	0.29	anything
different	8	0.29	different, differently
difficult	8	0.29	difficult
find	8	0.29	find, finding
first	8	0.29	first
found	8	0.29	found
necessary	8	0.29	necessary
self	8	0.29	self
talk	8	0.29	talk, talked, talks
technique	8	0.29	technique, techniques
unsure	8	0.29	unsure
without	8	0.29	without
yet	8	0.29	yet
adding	7	0.25	added, adding
argument	7	0.25	argument, arguments
confusing	7	0.25	confuse, confused, confusing
explanation	7	0.25	explanation, explanations
following	7	0.25	follow, followed, following
hope	7	0.25	hope, hopefully, hoping
much	7	0.25	much
peer	7	0.25	peer
redundant	7	0.25	redundancy, redundant
relating	7	0.25	relatable, relate, related, relating
see	7	0.25	see
structure	7	0.25	structure, structuring
support	7	0.25	support, supported, supports
title	7	0.25	title, titles
understand	7	0.25	understand, understandable

* Weighted Percentage: "the frequency of the word relative to the total words counted. If you adjusted the slider to include similar words, a word may be part of more than one group of similar words. The weighted percentage assigns a portion of the word's frequency to each group so that the overall total does not exceed 100%." (QSR International, n.d.)

Appendix F.

Coding notes for a second coder

Summary of coding category

Writers

	Main category	Subcategory
1	Focus	Content/Subject; Organization; Language; Format/Presentation; Other *You could include more than on subcategory in one idea unit (e.g. Content/Subject AND Organization)
2	Location of comments	Overall Specific; In text; Other
3	Response from reviewers	Got response; Did not get response; No need to get response

*Coding combination: 1+2+3

Reviewers

	Main category	Subcategory
1	Affective	Negative; Positive; Neutral; Positive-Neutral; Neutral-Positive
2	Cognitive	Confirmation only; Confirmation AND; Correction; Identify Problem (+Justification/Explanation & Suggestion/Solution; + Justification/Explanation; + Suggestion/Solution); Justification/Explanation & Suggestion/Solution ONLY; Justification/Explanation ONLY; Suggestion/Solution ONLY
3	Focus	Content/Subject; Organization; Language; Format/Presentation; Other *You could include more than on subcategory in one idea unit (e.g. Content/Subject AND Organization)
4	Feedback response	Independent feedback; Response to writers' comment
5	Location of comments	Overall Specific; In text; Other
6	Other	Reviewers' comments which do not fall neither Affective/Cognitive/Focus category (e.g. "I hope this helps! Let me know if there are any questions!" "Hello! I have left comments beside your paragraphs, but please don't feel overwhelmed by them."

*Possible coding combination: 1+2+3+4+5; 1+3+4+5; 4+5+6

Detailed coding category

Writers' comments (Objective: What writers want from reviewers.)

Initial themes			
	Subcategory	Description	Examples
Focus			
	Topic	Requesting to check the accuracy/relevancy/clarity of their contents and/or subject knowledge. (e.g. knowledge of theory)	"Is my example a good example of Environmental structuring? / Is environmental structuring an appropriate choice of theory?" "I am concerned about whether my second focus fits well with the video since the video is not test oriented."
	Organization	Requesting to check the quality of their paragraph/unit arrangement. (e.g. structure, organization, flow, coherence, transition)	"does the connection between the description and the analysis clear?" "In addition, I realize that my sections are quite large and I am unsure if I should alter them to have smaller paragraphs in each description/analysis section." "Is this paragraph too short? Should I be adding something else?"
	Language	Requesting to check the accuracy of their language use. (e.g. spelling, grammar, sentence structure, word choice)	"How is my overall sentence structure and grammar?" "I think these are boring sentence starters but I'm not sure what to change it to." "Change to really think, or start thinking or just leave it?"
	Format	Requesting to check the appropriateness of their format use. (e.g. citation, line spacing, word count)	"I was unsure about my citing technique especially regarding the 25 Learning Principles in which there were multiple authors and articles for the concept I argued in my second point." "Do we require a references page? I can't find it in the instructions."
	Other (not include in coding scheme)	When the writers' request is too vague/general that unable to identify any above subcategories	"I'm still working on my last analysis so you can just review my first two analysis and the proposal." "You may give me feedback on any major areas of concern that you find."

Location of comments

Overall	Comments were written on the Overall section
Specific	Comments were written on the side margin
Other	Comments were written on other than the Overall section/side margin (e.g. end of the writers' draft)
In text	Corrections were made inside the writers' draft

Response from Reviewer (When writers provided request/concern comments to reviewers)

Got response	Writers received a response from reviewers
Did not get response	Reviewers did not provide feedback comments
No need to get response	Writers are not expecting to receive feedback from reviewers (e.g. "I will do my citations and formatting later" "Please do not focus on grammar (I can do this on my own) unless of course you see something very problematic."

Reviewers' comments

	Subcategory	Description	Examples
Affective			
	Negative	Negative statements	(No Negative comments were identified in the current study)
	Neutral	Nether negative nor positive	"Give more of an explanation of what this theory is, in order to then teach in the various forms." "The words/sentences in red means you might want to remove them from your paragraph."
	Positive	Positive statements	"This is good as it is very specific to the style of teaching." "Really good analysis! The connection you make between the theory and the clip are clear and concise!"
	Neutral-Positive	Providing neutral comments first, then stating positive comment later in the same idea unit	"Double-check some of those citations, as I am also unsure if they are entirely correct. Other than that, awesome job." "Just adding some more evidence and overall it looks really good!"
	Positive-Neutral	Stating positive comments first, then providing neutral comments later in the same idea unit	"I think your theories work well (I actually used the spatial contiguity for the same video as well!) The one problem would be that you use the exact same theory in one analysis and the proposal." "Overall this is a good idea. I encourage you to expand further (using examples) and referencing theories."
Cognitive			
	Confirmation only	Confirming the questions/concerns raised by writers. When reviewers were uncertain about their answers or disagree with the questions, do not apply this category.	"Yes this makes sense as a theory good explanation." "I think this is clear enough for the readers to understand what you're trying to say!"
	Confirmation AND	Confirming the questions/concerns raised by writers AND added more related cognitive comments	"I agree that the pre-training principle would be effective. To clearly show why, I recommend clearly defining and comparing the personalization principle and the pre-training principle." "And yes your analysis is really short, please go in depth with the theory and refer back to the description section."
	Correction	Focus on the correctness of work (including grammatical & format correction) No justification and/or suggestion are provided	"No comma needed." "Don't need the "'s"" "Tense: invited" "Take out apostrophe"
	Identify problem only	Identifying problems which need to be fixed	"Can you prove this?" "How is the teacher introducing a new math task? Via handout? Overhead projection?"
	+ Explanation	Providing justification or explanations to the problem identified by reviewers	"Don't forget to double space! I wouldn't necessarily mention this but I got marks off for forgetting to double space." "Be careful here. Elaborative Interrogation is concerned with "why questions."""
	+ Direction	Providing directions, concepts, strategies, or solution for fixing the problems/the improvement of work	"This paragraph seems a little redundant and it can be more concise. I also feel like this paragraph will be more fitting in the description instead of analysis." "
	+ Explanation + Direction	Providing justification/explanations to the problem/suggestions/solutions identified by reviewers	"I'm not quite sure about the time you put down here, because you use multiple times for the description/analysis… I would suggest writing down a segment of time. Ex: 0:58-1:37." "I don't think this part is necessary (especially if you are looking to decrease your word count), as it is a proposal of something to change, as such it is more suited for the proposal section."
	Explanation only	Providing justification or explanations to the problem identified by reviewers. However, problems were not identified by reviewers but brought up by writers.	"The description and analysis relate well here, I think for this analysis to make sense, you need the sentence in your description. I don't think there is a problem with it." "I believe this paragraph contains a good amount of information so adding the cognitive load theory would be too excessive."
	Direction only	Providing directions, concepts, strategies, or solution for fixing the problems/the improvement of work. However, problems were not identified by reviewers but brought up by writers.	"I don't think you need to mention interleaved learning, unless you plan on incorporating the theory into your proposal." "Remember to clearly state what the learning theory is/consists of. Then make your argument using examples to justify whether you think the instructor applies it or not."
	Explanation + Direction	Providing justification or explanations to the problem/suggestions/solutions identified by reviewers. However, problems were not identified by reviewers but brought up by writers.	"To connect the theory to the Description even more, maybe also mention here the 'lively conversation' that occurred. I recall metacognition also involved the sharing of differing points of views, but that might have been for middle school aged students." "I think you should provide more information. The analysis here is a little convoluted. You also didn't mention if the teacher did this well or not."

Focus *This was adopted from the writers' comment analysis. (Hyland, 2001)			
	Topic	Commenting about content/subject focused issues. (e.g. accuracy/relevancy of theory) *revision of the Content/Subject could change the content of a paragraph/area/sentences	"I think the paper will be stronger if examples, or further explanations were provided to support the theory in how it will help the students learn in class." "I think some of your description is in the analysis portion. The second video segment hasn't been introduced here, which I think it should be." "Yes, when looking at the theory and the video this does seem to be true. The teachers questions are very simple and fact based."
	Organization	Commenting about structural organization of the text. (e.g. flow, coherence, transition)	"This paragraph seems a little redundant and it can be more concise. I also feel like this paragraph will be more fitting in the description instead of analysis." "Divide up your description and analysis section! Try to keep your description short and concise!"
	Language	Commenting on accuracy of language use. (e.g. spelling, grammar, word choice)	"Does this sentence mean that the students "demonstrated this well" or that they "demonstrated this AS well?" "I'm not sure what you are trying to say? Maybe there is an extra word in there or maybe a comma is needed?"
	Format	Commenting on appropriateness of format use. (e.g. citation, line spacing) (missed citation)	"Cite the reading not the source within the text." "Not sure how many words you will have if you take out the background information parts, but remember the word count is between 1200 – 1500"

Feedback response

Independent feedback	Feedback was generated by reviewers
Response feedback	Feedback was generated to reply writers' requests/questions *When writers wrote a request in the overall section but reviewers responded in the specific comment section, you can still code as "Response feedback" *When writers wrote comments in the overall section, if reviewers' comments are not directly related to the writers' comments, you should code as "Independent feedback" *When writers asked feedback about his/her overall writing in the overall section, any reviewers' comments in the overall section, those comments are considered as this category.

Appendix G.

Pearson's Correlation between Assignment 2 Score and Self-reported Scores (N ranges from 23 to 31)

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Assignment																								
1	Assignment 1	Pearson Correlation	1																						
		Sig. (2-tailed)																							
		N	31																						
2	Assignment 2	Pearson Correlation	.570**	1																					
		Sig. (2-tailed)	0.001																						
		N	31	31																					
3	Assignment 3	Pearson Correlation	.544**	.641**	1																				
		Sig. (2-tailed)	0.002	0.000																					
		N	31	31	31																				
4	Total (Assignment 1+2+3)	Pearson Correlation	.822**	.876**	.853**	1																			
		Sig. (2-tailed)	0.000	0.000	0.000																				
		N	31	31	31	31																			
	SEWS																								
5	Ideation	Pearson Correlation	0.032	0.200	0.072	0.125	1																		
		Sig. (2-tailed)	0.878	0.327	0.726	0.543																			
		N	26	26	26	26	26																		
6	Conventions	Pearson Correlation	0.106	-0.124	-0.066	-0.032	.441*	1																	
		Sig. (2-tailed)	0.606	0.548	0.749	0.877	0.024																		
		N	26	26	26	26	26	26																	
7	Self-regulation	Pearson Correlation	0.364	.393*	0.291	.426*	.458*	0.293	1																
		Sig. (2-tailed)	0.068	0.047	0.150	0.030	0.019	0.147																	
		N	26	26	26	26	26	26	26																
8	Total	Pearson Correlation	0.259	0.244	0.165	0.273	.765**	.697**	.836**	1															
		Sig. (2-tailed)	0.202	0.229	0.420	0.177	0.000	0.000	0.000																
		N	26	26	26	26	26	26	26	26	26	26	26	23	24	24	24	24	24	23	24	24	24	24	24
	WSES																								
9	Writing task	Pearson Correlation	-0.260	0.042	-0.106	-0.130	.443*	0.328	0.231	.406*	1														
		Sig. (2-tailed)	0.200	0.838	0.605	0.527	0.024	0.102	0.256	0.040															
		N	26	26	26	26	26	26	26	26	26														

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10	Writing skill	Pearson Correlation	0.208	-0.107	-0.058	0.021	.535**	.908**	0.351	.727**	0.325	1													
		Sig. (2-tailed)	0.309	0.602	0.778	0.920	0.005	0.000	0.079	0.000	0.105														
		N	26	26	26	26	26	26	26	26	26	26													
11	Total	Pearson Correlation	-0.126	-0.009	-0.108	-0.096	.565**	.620**	0.323	.611**	.928**	.654**	1												
		Sig. (2-tailed)	0.540	0.967	0.600	0.642	0.003	0.001	0.107	0.001	0.000	0.000													
		N	26	26	26	26	26	26	26	26	26	26	26												
	MSLQ: Motivation																								
12	Intrinsic Goal Orientation	Pearson Correlation	-0.073	-0.227	-0.018	-0.134	0.335	0.337	-0.063	0.210	0.061	0.400	0.210	1											
		Sig. (2-tailed)	0.710	0.246	0.929	0.496	0.118	0.116	0.777	0.336	0.783	0.059	0.336												
		N	28	28	28	28	23	23	23	23	23	23	23	28											
13	Extrinsic Goal Orientation	Pearson Correlation	-0.008	-0.020	-0.074	-0.039	0.237	-0.085	-0.069	0.006	-0.085	-0.034	-0.082	0.235	1										
		Sig. (2-tailed)	0.965	0.919	0.701	0.840	0.264	0.692	0.747	0.979	0.693	0.874	0.704	0.228											
		N	29	29	29	29	24	24	24	24	24	24	24	28	29										
14	Task Value	Pearson Correlation	.430*	0.195	.382*	.391*	0.294	0.373	0.237	0.375	0.178	.476*	0.333	.430*	0.187	1									
		Sig. (2-tailed)	0.020	0.310	0.041	0.036	0.163	0.072	0.265	0.071	0.404	0.019	0.112	0.022	0.332										
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29									
15	Control of Learning Beliefs	Pearson Correlation	-0.001	-0.114	0.148	0.005	-0.105	0.011	0.081	0.016	-0.075	0.074	-0.031	.401*	.473**	0.235	1								
		Sig. (2-tailed)	0.995	0.555	0.442	0.981	0.627	0.958	0.708	0.940	0.727	0.730	0.886	0.034	0.009	0.220									
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29	29								
16	Self-Efficacy for Learning & Performance	Pearson Correlation	-0.004	0.013	0.076	0.032	0.401	0.234	0.166	0.316	0.338	0.287	0.386	.455*	.651**	0.294	.491**	1							
		Sig. (2-tailed)	0.983	0.945	0.695	0.869	0.052	0.270	0.439	0.132	0.106	0.174	0.063	0.015	0.000	0.121	0.007								
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29	29	29							
	MSLQ: Learning strategies																								
17	Critical Thinking	Pearson Correlation	0.131	-0.278	-0.101	-0.106	0.180	-0.048	-0.096	-0.014	-0.203	0.028	-0.152	.453*	.479**	0.239	0.159	0.340	1						
		Sig. (2-tailed)	0.499	0.144	0.603	0.584	0.400	0.825	0.656	0.948	0.341	0.896	0.478	0.016	0.009	0.212	0.410	0.071							
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29	29	29	29						
18	Metacognitive Self-Regulation	Pearson Correlation	-0.019	0.108	0.086	0.070	.446*	.466*	0.162	.417*	0.389	.436*	.492*	.526**	.478*	.578**	0.304	.576**	0.319	1					
		Sig. (2-tailed)	0.924	0.584	0.664	0.722	0.033	0.025	0.462	0.048	0.067	0.038	0.017	0.005	0.010	0.001	0.115	0.001	0.098						
		N	28	28	28	28	23	23	23	23	23	23	23	27	28	28	28	28	28	28					
19	Effort Regulation	Pearson Correlation	0.362	0.279	0.179	0.327	0.182	0.217	0.088	0.193	0.149	0.209	0.203	0.016	0.241	0.357	0.123	.373*	0.027	.450*	1				
		Sig. (2-tailed)	0.053	0.143	0.353	0.084	0.395	0.309	0.683	0.366	0.486	0.326	0.341	0.937	0.207	0.057	0.526	0.046	0.890	0.016					
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29	29	29	29	28	29				
	AGQ																								
20	Mastery-approach goal	Pearson Correlation	0.149	0.171	.449*	0.296	.451*	0.196	.422*	.465*	0.111	0.260	0.193	.514**	.459*	.578**	.458*	.532**	0.342	.670**	0.345	1			

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
		Sig. (2-tailed)	0.439	0.376	0.014	0.119	0.027	0.360	0.040	0.022	0.605	0.221	0.367	0.005	0.012	0.001	0.012	0.003	0.069	0.000	0.067				
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29	29	29	29	28	29	29			
21	Performance-approach goal	Pearson Correlation	.388*	0.114	-0.034	0.188	.410*	0.222	.414*	.457*	0.068	0.323	0.184	0.198	.546**	.418*	0.098	.520**	0.299	.415*	.483**	.427*	1		
		Sig. (2-tailed)	0.037	0.555	0.861	0.330	0.047	0.298	0.044	0.025	0.751	0.123	0.390	0.313	0.002	0.024	0.612	0.004	0.115	0.028	0.008	0.021			
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29	29	29	29	28	29	29	29		
22	Performance-avoidance goal	Pearson Correlation	0.329	0.026	0.043	0.155	-0.211	-0.302	0.161	-0.092	-.408*	-0.263	-.432*	0.142	.420*	0.087	0.359	0.149	0.272	-0.084	-0.007	0.259	.398*	1	
		Sig. (2-tailed)	0.081	0.894	0.825	0.423	0.322	0.151	0.452	0.668	0.048	0.215	0.035	0.470	0.023	0.655	0.056	0.440	0.153	0.670	0.971	0.174	0.032		
		N	29	29	29	29	24	24	24	24	24	24	24	28	29	29	29	29	29	28	29	29	29	29	
23	Self-reported GPA	Pearson Correlation	0.026	.415*	0.168	0.246	-0.143	-0.288	-0.191	-0.270	0.134	-0.309	-0.037	-0.283	0.094	-0.162	0.063	0.018	-.398*	0.105	0.197	-0.222	-0.054	-0.214	1
		Sig. (2-tailed)	0.895	0.025	0.383	0.199	0.505	0.172	0.372	0.201	0.534	0.142	0.862	0.161	0.642	0.420	0.757	0.928	0.040	0.608	0.326	0.266	0.791	0.284	
		N	29	29	29	29	24	24	24	24	24	24	24	26	27	27	27	27	27	26	27	27	27	27	29

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Note. Numbers highlight yellow indicate the correlation between the Assignment 2 score and other self-reported scores.

Appendix H.

Case 1: Student A's Revision Action

Writer A's comment	Reviewer A 's comment	Writer A's first draft	Writer A's final version	Revision action
-	-	[Section structure] *1) Using Data Verification to develop a different perspective* *2) Using feedback to improve task performance* *3) Using self explanation to improve comprehension* *4) Proposal to enhance student learning* *What is the scenario?* What is wrong and why? Proposal	*1) Fostering a Setting for Epistemic Growth* *2) Metacognition* *3) Teacher Directed Method of Instruction* *Proposal to Improve the Effectiveness of Point 3* *What it is* *How*	
Overall comment				
W-U1) *I tried to be thorough, however I am worried about adding extra information (if needed) since I am at 1540 word count. I left specific comments where I wasn't sure if something was necessary or not.* <Other>	[N/A]			
W-U2) *Please comment on clarity of analysis, and whether they are strongly argued or if I am missing important components.* <Content/ Subject>	[Provided – in the specific comment section]			
Specific comment				
W-IU3) *Should I do apa title page, running head etc? I wasn't very clear on this.* <Format/ Presentation>	R-U1) I would suggest that you follow the APA style guidelines with the title page, running head and page numbers and add it on. (adopted) <Neutral; Confirmation Only; Format/ Presentation> R-U2) *I also think that if your way of specifying the age group in the videos is middle school and elementary then I believe that would be okay with [the instructor], but just double check with her on Friday.* (undetermined) <Neutral; IP + Suggestion/ Solution; Language>	[No title page]	[Added a title page]	Formal Change

Writer A's comment	Reviewer A 's comment	Writer A's first draft	Writer A's final version	Revision action
		Video URL: 1) https://www.youtube.com/watch?v=wCogwVMM4aQ (1:52 - 3:24) Elementary	*Link: https://www.youtube.com/watch?v=wCogwVMM4aQ (1:52 - 3:24)* *Age Group: Elementary*	Formal Change
-	-	*This process is continued, until a few more possible combinations are provided by the students.*	*This process is continued, until the students provide a few more possible combinations.*	Meaning-Preserving Change
W-U4) *I didn't talk about biases. Do you think it is important to include? I am at 1540 words so I had to make some cuts.* <Content/ Subject>	R-U3) *[The instructor] will be very strict on word count this time around so I can understand where you are coming from I would suggest including a little bit about it.* (undetermined) <Neutral; Confirmation And; Explanation/ Justification + Suggestion/ Solution; Content/ Subject>	*Analysis: According to Ellis, S., et al., (2014), data verification is one of the three functions of the learning procedure systematic reflection. This process […]* [This whole analysis section was deleted.]	*Analysis: According to Muis and Duffy (2013), epistemic growth occurs when the teacher models critical thinking of content, evaluation of multiple approaches to solving a problem and forming connections to prior knowledge. Based on this criteria, […]*	Macrostructure Change
-	-	*2) Using feedback to improve task performance*	*2) Metacognition* *Link: https://www.youtube.com/watch?v=wCogwVMM4aQ (27:29 - 28:35)* *Age Group: Elementary*	Microstructure Change; Formal Change
-	R-U4) *Watch out for repetitive writing.* (adopted) <Neutral; Identify Problem Only; Language>	*Description: To start the lesson, the teacher the teacher has illustrated three columns on the board.*	*Description: On the board the teacher has illustrated three columns.*	Meaning-Preserving Change
-	-	*To start the activity, the instructor asks "what combination of twelve crayons can be made, with the least amount of red crayons." (children have already had time to work in groups to find all possible combinations to fill a crayon box that holds exactly twelve, and must hold a combination of red and blue).*	*To start the activity, the instructor asks, "what combination of twelve crayons can be made, with the least amount of red crayons?" (Children have already had time to work in groups to find all possible combinations to fill a crayon box that holds exactly twelve, and must hold a combination of red and blue).*	Formal Change
-	-	*Following this prompt, a girl stands up to write zero in the red crayon column in red pen, and twelve in the blue crayon column in blue pen to form a sum of twelve crayons.*	*Following this prompt, a girl stands up and writes zero in the red crayon column in red pen, and twelve in the blue crayon column in blue pen to form a sum of twelve crayons.*	Meaning-Preserving Change
-	-	*At this time, a student shares that he thinks the answer is wrong since one color does not form a combination.*	*At this time, a boy declares "I think the answer is wrong since one color does not form a combination."*	Meaning-Preserving Change
-	-	*The teacher builds on his comment by providing outcome feedback that the answer on the board is incorrect. She then explains that since the questions requires a combination of crayons, you must have at least two things that come together as one.*	*After this, the teacher verbally confirms that the boys' judgment of learning is correct, and that the answer on the board is incorrect.*	Microstructure Change
-	-	*Analysis: According to authors Ellis, S., et al., (2014), feedback is one of the three functions of systematic reflection. There are two types of […]* [This whole analysis section was deleted.]	*Analysis: According to authors Dimmitt and McCormick (2012), metacognition is defined as "thinking about thinking" (p.157). When the boy makes a judgment of […]*	Macrostructure Change

Writer A's comment	Reviewer A 's comment	Writer A's first draft	Writer A's final version	Revision action
-	R-U5) *Check to see if you have an extra space before the quote and before the start of your next sentence.* (adopted) <Neutral; IP + Suggestion/ Solution; Format/ Presentation>	*In addition, the teacher explains that a correct solution must include both colors because a combination requires at least "two things to be put together as one." By clarifying the requirements of a combination to her class, the teacher effectively applies the second type of feedback that aims to improve future task performance.*	[This part was deleted. However, this issue was fixed. (e.g., *In addition, research supports that if you are a flexible learner, your epistemic beliefs, also known as "beliefs about knowledge" are more developed (Muis and Duffy, 2013).*)]	Formal Change
-	-	*3) Using self explanation to improve comprehension* *Description: The teacher announces the class will be performing a science experiment. Prior to […]* [This whole section was deleted.]	*3) Teacher Directed Method of Instruction* *Link: https://www.youtube.com/watch?v=NoqItGgT-EY (31:00 - 33:00)* *Age Group: Middle school* *Description: During the lesson, the teacher asks a student to read both of the paragraphs on the power point slide aloud. While he does so, his […]*	
-	-	[From '*4) Proposal to enhance student learning*' section] *What is the scenario? At the given moment of the video that I have chose to focus on, the teacher has asked a student to read both of the paragraphs on the power point slide. While doing so aloud, all the students have their own copy in front of them so that they can follow along. It is an informative text that talks about ways a cancer patient receives chemotherapy, for example through an intravenous. After the passage has been read, the teacher asks "what are some important things we should highlight?" A student suggests that is it important to highlight the words: a doctor called an oncologist. Following this, the teacher agrees it is important and proceeds to highlight the term on the power point and encourages the students to do so as well on their own copies. After this, the instructor verbally explains what the term oncologist means by expressing that an oncologist is a doctor who deals specifically with cancer.*	*Description: During the lesson, the teacher asks a student to read both of the paragraphs on the power point slide aloud. While he does so, his classmates have their own copy in front of them to follow. It is an informative text that talks about ways a cancer patient receives chemotherapy, for example through an intravenous. It is an informative text that talks about ways a cancer patient receives chemotherapy, for example through an intravenous. After the passage has been read, the teacher asks, "what are some important things we should highlight?" A student suggests that is it important to highlight the word "oncologist". Following this, the teacher agrees it is important and proceeds to highlight the term on the power point and encourages the students to do so as well on their own copies. Instantly after this, the teacher verbally tells students that an oncologist is a doctor who deals specifically with cancer.* [This sentence was moved to the '3) Teacher Directed Method of Instruction' section.]	Microstructure Change
W-U5) *I'm not sure if this is overall a good (the best possible) analysis? Or if I should just scratch it and write something else* <Content/ Subject>	R-U6) ***Your sentence structure could be better I see a lot of small words in your paragraphs that don't necessarily need to be there. For example you can say that self explanation is a teachers'/learners' practice that involves having students explain their processing during learning through taking notes.*** (undetermined) <Neutral; IP + Explanation/ Justification + Suggestion/	*Analysis: According to Dunlosky et al., (2013), self-explanation is a teachers'/learners' practice that involves having students explain of their processing during learning for example through taking notes. The theory behind why this technique […]* [This whole analysis section was deleted.]	*Analysis: According to Muis and Duffy (2013), a traditional learning environment (also known as a teacher centered approach) occurs when the teachers' method of instruction involves mostly lecturing and transmitting knowledge. In addition, research supports that this type of pedagogical […]*	Macrostructure Change

Writer A's comment	Reviewer A 's comment	Writer A's first draft	Writer A's final version	Revision action
	Solution; Language> R-U7) *In terms of it being a good overall analysis of self explanation you need to consider that learning through taking notes is also considered a belief based cue in self regulated learning.* (undetermined) <Neutral; Suggestion/ Solution; Content/ Subject>			
-	-	[From '*4) Proposal to enhance student learning*' section] *What is wrong and why? By simply telling the students the definition of the unknown term rather than having them look it up, is an example of a traditional learning environment that involves lecturing and transmitting knowledge also known as a teacher centered approach (Muis, Duffy 2013). According to Muis and Duffy 2013, research supports that this type of pedagogical practice gives students limited opportunities for "collaboration, application, or personal or social construction of knowledge" (p.214). Although, it is important to […]*	*Analysis: According to Muis and Duffy (2013), a traditional learning environment (also known as a teacher centered approach) occurs when the teachers' method of instruction involves mostly lecturing and transmitting knowledge. In addition, research supports that this type of pedagogical practice does not enhance student learning since teacher directed instruction limits students' opportunities for "collaboration, application, or personal or social construction of knowledge" (Muis and Duffy, 2013, p.214).* *Teacher directed instruction occurs in the video […]* [This sentence was moved to the '3) Teacher Directed Method of Instruction' section. New information was added in the rest of the part in this section.]	Macrostructure Change; Microstructure Change
-	R-U8) *Either say chosen* or that I chose to focus on*.* (undetermined) <Neutral; IP + Suggestion/ Solution; Language>	[From '*4) Proposal to enhance student learning*' section] *What is the scenario? At the given moment of the video that I have chose to focus on, the teacher has asked a student to read both of the paragraphs on the power point slide.* [This sentence was deleted.]	*What it is: To enhance student learning in this given scenario, I recommend the teacher seeks out to develop a constructivist pedagogical approach.*	Macrostructure Change
W-U6) *I used a completely different video than what I used for my other 3 parts. Do you think that is bad?* <Other> W-U7) *Also I struggled with introducing my proposal in a way that the context was clear without using a lot of my word count. Suggestions please?* <Content/	R-U9) *You can use different videos as [the instructor] mentioned, but double check with [the instructor] as I am not too sure about this one because this is your proposal section of the essay and it should relate to the video you used for your description and analysis.* (undetermined) <Neutral; Confirmation And; Explanation/ Justification + Suggestion/ Solution; Other> R-U10) *I will leave a comment on your proposal below.* <Neutral; Other>	*4) Proposal to enhance student learning* *What is the scenario? At the given moment of the video that I have chose to focus on, the teacher has asked a student to read both of the paragraphs on the power point slide. While doing so aloud, all the students have their own copy in front of them so that they can follow along.* [This part was modified and moved to the '*3) Teacher Directed Method of Instruction*' section. So, the writer A wrote proposal based on the video used in the third focus point.]	*Proposal to Improve the Effectiveness of Point 3* *What it is: To enhance student learning in this given scenario, I recommend the teacher seeks out to develop a constructivist pedagogical approach.* *Description: During the lesson, the teacher asks a student to read both of the paragraphs on the power point slide aloud. While he does so, his classmates have their own copy in front of them to follow.*	Microstructure Change Meaning-Preserving Change

Writer A's comment	Reviewer A 's comment	Writer A's first draft	Writer A's final version	Revision action
Subject>		[Responded – See comment R-U11, R-U12, R-U13]		
-	R-U11) *I think you did a really good job on your proposal and if you are stressing about the word count then I would go through your essay and try to re word some sentences that can give you some extra words to work with in places you see fit. If you really want to, rewrite your proposal without considering the word count. Then incorporate it into your essay and see if you can get rid of some things in other paragraphs or in the proposal itself.* (undetermined) <Positive-Neutral; IP + Suggestion/ Solution; Other>	['*4) Proposal to enhance student learning*' Section: Word count: 440] What is the scenario? At the given moment of the video that I have chose to focus on, the teacher […]. What is wrong and why? By simply telling the students the definition of the unknown […]. Proposal: To enhance student learning in this given scenario and give students the opportunity to build knowledge collaboratively and through application I recommend the teacher to seek to develop a constructivist pedagogical approach. As Muis and Duffy 2013 have noted, a constructivist learning environment puts students in control of their learning and gives them the opportunity to explore materials, essentially encouraging them to be active problem solvers. For example, after discussing as a group what the important ideas and terms are in the text, the instructor should break the class into smaller groups of three to four students and give them the opportunity to do the problem solving. Such as, discussing together what they think the term may mean. Or, if they are still unsure of the meaning, they can search for the definition in a dictionary. By doing so, students can participate in a learning environment that encourages collaboration, application and personal or social construction of knowledge.	['*Proposal to Improve the Effectiveness of Point 3* ' – '*How*' section: Word count: 320] [The majority of information was changed What it is: To enhance student learning in this given scenario, I recommend the teacher seeks out […]. How: For example, I like that the instructor discusses as a group what the important ideas and terms are in the text because the guidance ensures students are focusing on the right ideas. However, I'd like to point out that prior to doing so, I think it is important for the instructor to ensure that the students understand all of the vocabulary in the text. This way the instructor can be sure that students fully understand the text prior to picking out important ideas and concepts. In addition, to develop a constructivist pedagogical approach, rather than the instructor revealing the definitions of the unknown vocabulary, I recommend the instructor break the class into smaller groups of three to four students and give them the opportunity to do the problem solving. There are various problem solving strategies the students could use that would allow them to participate in a learning environment that encourages collaboration, application and personal or social construction of knowledge. Such as, discussing together what they think the unknown term(s) may mean, or if they are still unsure of the meaning they can search for the definition in a dictionary. This way through application, students are taking on the role of active problem solvers and exploring materials in a way that is collaborative and is constructed from personal or social factors (Muis and Duffy, 2013). Instead of being exposed to a teacher directed approach. If this proposal is implemented, it would manipulate the class in a way that effectively enhances student learning. [Both information and organization of this section was drastically changed, even thought some ideas form the first draft were kept.]	Macrostructure Change
-	-	[From '*4) Proposal to enhance student learning*' section] *Proposal: To enhance student learning in this given scenario and give students the opportunity to build knowledge collaboratively and through application I recommend the teacher to seek to develop a constructivist pedagogical approach. As Muis and Duffy 2013 have noted, a constructivist learning environment puts students in control of their learning and gives them the opportunity to explore materials, essentially encouraging them to be active problem solvers.*	*Proposal to Improve the Effectiveness of Point 3* *What it is: To enhance student learning in this given scenario, I recommend the teacher seeks out to develop a constructivist pedagogical approach. As Muis and Duffy (2013) have noted, a constructivist learning environment puts students in control of their learning and gives them the opportunity to explore materials, essentially encouraging and allowing them to be active problem solvers.* *How: For example, I like that the instructor […]*	Microstructure Change

Writer A's comment	Reviewer A 's comment	Writer A's first draft	Writer A's final version	Revision action
		For example, after discussing as a group what […]	[This part was moved to 'Proposal to Improve the Effectiveness of Point 3'; 'What it is:' section. New information was added in the rest of the part in this section.]	
-	-	[From '*4) Proposal to enhance student learning*' section; 'Proposal:' section] *For example, after discussing as a group what the important ideas and terms are in the text, the instructor should break the class into smaller groups of three to four students and give them the opportunity to do the problem solving. Such as, discussing together what they think the term […]*	*In addition, to develop a constructivist pedagogical approach, rather than the instructor revealing the definitions of the unknown vocabulary, I recommend the instructor break the class into smaller groups of three to four students and give them the opportunity to do the problem solving.* [This part was moved to 'Proposal to Improve the Effectiveness of Point 3'; 'How:' section.]	Macrostructure Change
-	-	[From '*4) Proposal to enhance student learning*' section; 'Proposal:' section] *Proposal: […] Such as, discussing together what they think the term may mean. Or, if they are still unsure of the meaning, they can search for the definition in a dictionary. By doing so, students can participate in a learning environment that encourages collaboration, application and personal or social construction of knowledge*.	*There are various problem solving strategies the students could use that would allow them to participate in a learning environment that encourages collaboration, application and personal or social construction of knowledge. Such as, discussing together Such as, discussing together what they think the unknown term(s) may mean, or if they are still unsure of the meaning they can search for the definition in a dictionary. This way […]* [This part was moved to 'Proposal to Improve the Effectiveness of Point 3'- 'How:' section.]	Meaning-Preserving Change
-	R-U12) *I recommend the teacher seeks out to develop a constructivist approach.** (adopted) <Neutral; Correction; Language>	*Proposal: To enhance student learning in this given scenario and give students the opportunity to build knowledge collaboratively and through application I recommend the teacher to seek to develop a constructivist pedagogical approach.*	*What it is: To enhance student learning in this given scenario, I recommend the teacher seeks out to develop a constructivist pedagogical approach.*	Meaning-Preserving Change
-	R-U13) *I think overall you have a very well written paper that follows the guidelines of the assignment. You just seem really worried about the word count which could have affected the way you approached your proposal and how you structured your sentences. Just fix those few little things and you should be good. Job well done! Hope this was helpful.* (adopted) <Positive-Neutral; IP + Suggestion/ Solution; Other>	[Word count in '*4) Proposal to enhance student learning*' section: 440]	[Word count in 'Proposal to Improve the Effectiveness of Point 3' section: 320] [The writer revised this section by moving some contents to another section and the different paragraph in the same section. Some sentence structures were changed but quite many ideas were kept in this section.]	Microstructure Change

Note: W-U: identified Unit in the writer's request comments; R-U: identified Unit in the reviewer's feedback comments; Italic texts indicate directly cited texts from the writer's essay. Bold texts indicate feedback comments which were selected as a helpful comment by the writer. The writer's adoption of the received feedback was show in the (). The type of each comment was shown in the <>. An addition or explanation which the investigator inserted was show in the [].

Appendix I.

Case 2: Writer B's Revision Action

Writer B's comment	Reviewer B 's comment	Writer B's first draft	Writer B's final version	Revision action
-	-	[Section structure] Imagery Technique Hypercorrect Effect Summarization Technique Proposal	[Section structure] *Cued Recall* *Hypercorrect Effect* *Elaborative Interrogation* *Proposal*	
Overall comment				
W-U 1) *Overall concern is the application of theories to the descriptions. I had a hard time identifying the theories for these readings, so I am unsure if the theories are applied and/or explained correctly.* <Content/ Subject>	[While Reviewer B did not provide her response on the overall feedback section, she addressed Writer B's concerns in the specific feedback section.]	-	-	-
W-U 2) *I am also concerned about my descriptions, if they make sense or not and if they need more information to describe the setting.* <Content/ Subject>	[While Reviewer B did not provide her response on the overall feedback section, she addressed Writer B's concerns in the specific feedback section.]	-	-	-
W-U 3) *I do not mind if you mark-up grammar mistakes as well.* <Language>	[While Reviewer B did not provide her response on the overall feedback section, she addressed Writer B's concerns in the specific feedback section.]	-	-	-
-	-	*Video URL:* *1. ttps://www.youtube.com/watch?v=FG152JGTHzg (6:17)* *2. ttps://www.youtube.com/watch?v=wCogwVMM4aQ (27:25)* *3. https://www.youtube.com/watch?v=9nDEHQ4QIAA (2:02)*	*Video URL:* *Focus 1 & Proposal: https://www.youtube.com/watch?v=FG152JGTHzg (3:38; 14:16)* *Focus 2: https://www.youtube.com/watch?v=wCogwVMM4aQ (27:25)* *Focus 3: https://www.youtube.com/watch?v=4UMqF71owil (4:57)*	Formal Change [Macrostructure Changes were made on the Focus 1 & 3]
Specific comment				
	R-U1) *You've made some great connections in your paper!* <Positive; Content/Subject>	-	-	-

W-ID 4) *Does this make sense or should I reword it?* <Content/ Subject>	R-U2) *I think that because the focus is on the procedure of the experiment, you don't need to mention the picture of the outer ear/ear canal/inner drum?* (adopted) <Neutral; Confirmation And; Explanation+ Suggestion/ Solution; Content/Subject> R-U3) *When you say "the focus will be", do you mean that is the focus of the lesson or the focus of your analysis? its a little unclear* (adopted) <Neutral; Identify Problem Only; Language>	*The teacher draws a simple picture of the outer ear, ear canal, and inner drum on the board, but erases the drawing afterwards.* *The focus will be during the part where she is talking about the procedure of the experiment she wants the students to conduct.*	*In this lesson, the students are conducting an experiment to figure out how sounds are heard.* *The focus of the lesson is when she is asking the class what an experiment consists of.*	Microstructure Change Formal Changes
-	R-U4) *Maybe instead of "object" you could explain that the students are making a model of an ear canal and ear drum.* *It is clear what object you are talking about once I read through, but is confusing at first.* (undetermined) <Neutral; Identify Problem And; Explanation + Direction; Content/Subject>	*The students create an object with the materials the teacher provides.* [This part and the rest of the description section in her first focus point were deleted. She used a different scene in the same video to analyze a different theory.]	*The teacher is standing in front of the students, who are all sitting down on a rug and says "So when you do an experiment, in science, what are two things every experiment has?" Students raise […]*	Macrostructure Change
W-ID 5) *Should I just say object? Or do you have other suggestions to label the red cup/aluminum foil thing* <Language>	R-U5) *Maybe instead of object you could call it "the ear canal/drum" model* (undetermined) <Neutral: Direction Only: Language>	*During the procedure portion of the instruction, she holds an example of the red cup and aluminum foil object (without the beads).* [This part and the rest of the description section in her first focus point were deleted. She used a different scene in the same video to analyze a different theory.]	-	Macrostructure Change
-	R-U6) *if your focus is on the procedure of the experiment, is the mention of the drawing important?* (undetermined) <Neutral; Identify Problem Only; Content/Subject>	*She asks the students to look at the outer ear drawing she did on the board and realizes she erased it.* [This part and the rest of the description section in her first focus point were deleted. She used a different scene in the same video to analyze a different theory.]	-	Macrostructure Change
-	R-U7) *model?* (undetermined) <Neutral; Identify Problem And; Direction; Language>	*She continues the lesson by asking the students to imagine the picture of the ear and relate it to the object she is holding.* [This part and the rest of the description section in her first focus point were deleted. She used a different scene in the same video to analyze a different theory.]	-	Macrostructure Change

-	R-U8) *model?* <Neutral; Identify Problem And; Direction; Language>	*While holding the object in one hand, she uses her other hand to mimic the shape of an outer ear and places it on the bottom end of the cup.* [This part and the rest of the description section in her first focus point were deleted. She used a different scene in the same video to analyze a different theory.]	-	Macrostructure Change
W-ID 6) *Do not know if this is the correct theory associated with the imagery technique* <Content/ Subject>	R-U9) *Looks like the right theory to me, if you are unsure you could read through "6.1 General description of imagery use and why it should work" section of the article* (undetermined) <Neutral; Confirmation And; Direction; Content/Subject>	*The teacher is using an imagery technique during this focus of the instruction. The imagery technique is when individuals imagine the text that they are reading or listening to. The effect of the imagery technique is that it "can enhance one's mental organization or integration of information in the text, and idiosyncratic images of particular referents in the text could enhance learning as well (cf. distinctive processing; Hunt, 2006).* [The whole analysis section in her first focus point were deleted. She used a different theory for her analysis.]	*The teacher is using cued recall in the focus of this lesson. Cued recall "generally [involves] the presentation of a fact to prompt recall of the entity for which the fact is true (Bjork, Dunlosky, and Kornell, 2013)." Cued recall is […]*	Macrostructure Change
-	R-U10) ***Okay, I see now how the image of the drawing is relevant, Good Connection to theory!*** ***Maybe try to tie it into the focus of your description, which seemed to be the procedure*** (undetermined) <Positive-Neutral; Identify Problem And; Explanation +Direction; Content/Subject>	*When the teacher realized that she did not have the picture of the outer ear on the board, she asked the students to imagine the drawing. By doing this, she is encouraging the students to create the picture in their minds, which can help the students develop and remember the parts of the outer ear.* [The whole analysis section in her first focus point were deleted. She used a different theory for her analysis.]	-	Macrostructure Change
-	R-U11) *Great Description of the lesson!* <Positive; Content/Subject>	*The purpose of this math lesson is to find how many combinations of red crayons and blue crayons equal 12. The teacher asks the students to sit down on a rug, in front of a chart. The chart has two columns, red and blue, which represent the number of crayons in each colour.*	[No change]	-
-	R-U12) *the focus will be? or is?* (accepted) <Neutral; Identify Problem Only; Language> R-U13) *is it the focus of the lesson (in video_) or the focus of your description? that is a little bit unclear* (adopted) <Neutral; Identify Problem Only; Language>	*The focus will be when the teacher asks students to write an answer under each column, where the combination of the two numbers must equals 12.* [see R-U11]	*The focus of the lesson is when the teacher asks students to write an answer under each column, where the combination of the two numbers must equals 12.* [see R-U11]	Formal Change Meaning-Preserving Change

-	-	*The teacher agrees with his response and expands to the explanation by stating that "a combination means two things coming together into one.*	*The teacher agrees with his response and expands his explanation by saying that "a combination means two things coming together into one.*	Formal Change
-	-	*She further explains by saying that there needs to be at least one blue crayon to have a combination.*	*She further explains that there needs to be at least one blue crayon to have a combination.*	Formal Change
-	R-U14) *kind of awkward, maybe reword?* (adopted) <Neutral; Identify Problem Only; Language>	*When the teacher the peer of the student explained why the answer is incorrect and when she elaborated on the response, it supports the hypercorrection effect.*	*When the student is corrected on the error she made in her answer (where 12 and 0 equals a combination), this supports the hypercorrection effect.*	Meaning-Preserving Change
-	R-U15) *Good Connection!* <Positive; Content/Subject>	[see R-U13]		-
-	-	*When the student wrote her answer on the chart, she believed that she wrote a combination of 12.*	*When the student writes her answer on the chart, she believes that she wrote a combination of 12, which demonstrates high confidence.*	Formal Change; Meaning-Preserving Change
-	R-U16) *Good Connection!* <Positive; Content/Subject>	*When the student and the teacher identified the error in her answer, they are providing her with an opportunity for learning.*	*When her peer and her teacher identify the error in her answer, they are providing her with an opportunity for learning.*	Formal Change
-	-	*Bjork, Dunlosky, and Kornell, (2013) state that "making errors is often an essential component of efficient learning," which can help the student retain the information that a combination means there needs to be two numbers.*	*Bjork, Dunlosky, and Kornell, (2013) state that "making errors is often an essential component of efficient learning," which can help the student retain the information that a combination means there needs to be at least one item in the objects that are being combined.*	Meaning-Preserving Change
-	-	*Summarization Technique* *Description* *The teacher is teaching the students the life cycle of a butterfly. In the beginning of the lesson, she asks the students if they remember what book they read […]* [This whole section was deleted. She used a different video and theory for her third focus point.]	*Elaborative Interrogation* *Description* *The teacher is teaching the students about how birds' becks have adapted over time to accommodate to certain types of food. Before the activity, she reviews with the class, […]*	Macrostructure Change
-	R-U17) *focus of the video or focus of your analysis?* (undetermined) <Neutral; Identify Problem Only; Language>	*The focus of this video will be during her instructions of the project the students need to complete.* [This whole section was deleted. She used a different video and theory for her third focus point.]	-	Macrostructure Change
-	R-U18) *The teacher instructs the students to fold…* (undetermined) <Neutral; Correction; Language>	*The students need to fold a paper plate twice, to create 4 sections that represent the stages of a butterfly's cycle.*	-	Macrostructure Change

		[This whole section was deleted. She used a different video and theory for her third focus point.]		
W-ID 7) *Unsure if this is the theory behind summarization…* <Content/ Subject>	R-U19) *I think that is the right theory, you found it under the* *"general description of summarization and why it should work" section like [the instructor] said right*? (undetermined) <Neutral; Confirmation And; Explanation; Content/Subject>	*In this video, the teacher is using the summarization technique while learning the life cycle of a butterfly. Bretzing and Kulhavy's (1979) theory behind summarization is that "it can boost learning and retention because it involves attending to and extracting the higher-level meaning and gist of the material."* [This whole section was deleted. She used a different video and theory for her third focus point.]	-	Macrostructure Change
-	R-U20) *Good connection!* ***I think this quote might be helpful to strengthen this argument; summarization should also boost organizational processing, given that extracting the gist of a text requires learners to connect disparate pieces of the text, as opposed to simply evaluating its individual components*** *- found towards the end of summarization section (3.1)* (undetermined) <Positive-Neutral; Identify Problem And; Suggestion/ Solution; Content/ Subject>	*By organizing the four stages on the paper plate, it can help the students identify the main ideas and enhance summarization strategies.* [This whole section was deleted. She used a different video and theory for her third focus point.]	-	Macrostructure Change
-	R-U21) *This is a little awkward, maybe reword to something like:* *"one of the aspects of … I would handle differently would be the way the teacher instructed the students to conduct the experiment " ?* (adopted) <Neutral; Identify Problem And; Direction; Content/Subject>	*Proposal* *One aspect of the sound waves experiment I would do differently would be when the students are conducting the experiment.*	*Proposal* *One of the aspects of the sound waves experiment I would handle differently would be the way the teacher instructs the students on how to conduct the experiment.*	Meaning-Preserving Change
-	-	*In this experiment, the students had a red cup covered with aluminum foil, which was secured with an elastic band.*	*In this experiment, the students have a red cup covered with aluminum foil, which is secured with an elastic band.*	Formal Change
-	-	*They placed the cups on their desks and put beads in the aluminum foil.*	*They place the cups on their desks and put beads in the aluminum foil.*	Formal Change
-	-	*They were then instructed to hit the sides of the cup with a pencil.*	*They are then instructed to hit the sides of the cup with a pencil.*	Formal Change

-	-	*The teacher encouraged them to use different tactics and strengths when hitting the cup and to observe what happens to the beads.*	*The teacher encourages them to use different tactics and strengths when hitting the cup and to observe what happens to the beads.*	Formal Change
-	R-U22) *Good idea!* <Positive; Content/Subject>	*I would have also told the students to self-explain the process that is happening when they hit the cup.*	*I would also tell the students to self-explain the process that is happening when they hit the cup.*	Formal Change
-	R-U23) *Good connection to theory!* <Positive; Content/Subject>	*Self-explanation can improve the students' learning by integrating existing knowledge with new knowledge (Bjork, Dunlosky, and Kornell, 2013).*	[No change]	-
-	R-U24) *I don't really understand how this connections, maybe add a sentence underneath wrapping it up and connecting?* (adopted) <Neutral; Identify Problem And; Direction; Content/Subject>	*Since the students are trying to answer a question, by explaining how the beads react to different amounts of pressures hitting the cup, it can help the children relate the results to prior information. An example of prior information could be if the child knows that if they kick a soccer ball hard, it will go far.*	*Since the students are trying to answer how sounds are heard, by self-explaining how the beads react to different amounts of pressures hitting the cup, it can help the children relate the results to how sound different sound waves impact the ear drum.*	Microstructure Change

Note: W-U: identified Unit in the writer's request comments; R-U: identified Unit in the reviewer's feedback comments; Italic texts indicate directly cited texts from the writer's essay. Bold texts indicate feedback comments which were selected as a helpful comment by the writer. The writer's adoption of the received feedback was show in the (). The type of each comment was shown in the <>. An addition or explanation which the investigator inserted was show in the [].

Appendix J.

Case 3: Writer C's Revision Action

Writer C's comment	Reviewer C's comment	Writer C's first draft	Writer C's final version	Revision action
-	-	[Section structure] *1. Analyzing Behaviour to Understand Success and Failure (3:11- 8:26)* *2. Using Cues to Retrieve and Encode Information (11:06 – 11:50)* *3. High Confidence Errors and Effective Learning (12:09 – 13:05)* *Proposal*	[Section structure] *1. Strengthening Understanding by Reflecting (3:11- 8:26 & 16:08 – 16:34)* *2. Using Cues to Retrieve and Encode Information (11:06 – 11:50)* *3. High Confidence Errors and Effective Learning (12:09 – 13:05)* *Proposal*	
Overall comment				
W-U1) *I had a lot of difficulties finding theories to use in this second assignment. I would like to know your opinion on the ones I used. Are they even theories? Have I argued them okay and made it clear what I am connecting between the description and the analysis?* <Content/ Subject>	R-U1) *I'm slightly relieved to know that I wasn't the only one who found it hard to identify theories for this assignment. It definitely was way more confusing than last time.* <*Neutral; Other*> *R-U2) There's a little bit of uncertainty regarding the theory in your second observation which I addressed in comments below. If you want you can consult [the instructor] on what theories are acceptable to use before handing in your final copy.* <Neutral; Suggestion/ Solution Only; Content/Subject>	- [See R-U11]	-	-
W-U2) *Also, if there is anything I can delete in my descriptions or if you feel they are not specific enough please let me know!* <Content/ Subject>	R-U3) *You did well overall especially in your descriptions (they're very detailed!).* <Positive; Content/ Subject>	-	-	
-	R-U4) *Good job using sources to back up your claims. It shows that you know your stuff!* <Positive; Content/ Subject>	-	-	
Specific comment				
-	R-U5) *What did the items consist of?* (adopted) <Neutral; Identify Problem Only; Content/ Subject>	She told her students they were to go around the classroom and, using their non-dominant hand and the provided tool (mittens and tweezers which represented bird beaks), pick up whatever items (food) they could and bring them back to their desks (nests).	She told her students they were to go around the classroom and, using their non-dominant hand and the provided tool (mittens or tweezers which represented bird beaks), pick up whatever items (such as crumpled paper and pipe cleaners which represented food) they could and bring them back to their desks (nests).	Meaning-Preserving Change

-	-	Following the activity, the teacher rhetorically asked the class what objects were easy to pick and what ones they struggled with.	Following the activity, the teacher asked the class what objects were easy to pick up and what ones they struggled with.	Meaning-Preserving Change
-	R-U6) *This sentence can be considered to be eliminated. It seems a little redundant following the previous sentence.* (adopted) <Neutral; Identify Problem AND; Explanation +Direction; Organization>	Her next question asked what items were easy to pick up using the mitten beaks.	[Deleted]	Microstructure Change
-	-	One of her students responded that the paper was easy but the pipe cleaners were hard.	One of her students responded that paper was easier than pipe cleaners to pick up using an oven mitten.	Meaning-Preserving Change
-	-	The teacher summarizes what he says by stating the skinny objects were not as easy to pick up as the larger objects. The teacher asks other students to share their experiences they felt during the activity. Another student explains a very similar experience with the crumpled paper being easier to grab using the oven mittens.	The teacher asked a couple other students to share their experiences from the activity. Next, she started a long question based discussion to get the students connecting the activity to real life examples and thinking about different shapes and sizes of beaks and their corresponding food types.	Macrostructure Change
-	-	-	Later on in the discussion about bird adaptations the teacher shifted focus from birds to fish. She verbally asked […]	Macrostructure Change
W-U3) *Is systematic reflection the theory? Or am I able to just argue one of three of its components which is self-explanation? I got the impression from [the instructor's] email that is was self-explanation in the Dunlosky article that was not a theory but a technique...* <Content/ Subject>	R-U-7) *I used systematic reflection in my paper too but I was also confused with [the instructor's] email regarding that article… I think it would be safest to focus more on systematic reflection as a whole to fulfill the theory criteria but then go into detail about how self-explanation is a function of systematic reflection and how it was used in this video.* (adopted) <Neutral; Suggestion/ Solution Only; Content/ Subject>	The teacher was promoting self-explanation in order to strengthen the student's understandings of how their actions resulted in certain outcomes. Self-explanation, part of systematic reflection, is when students actively analyze their behaviours in order to understand reasons for their success or failure (Ellis, Carette, Anseel & Lievens, 2014). The teacher made her students aware, prior to the activity, that they should be considering what it was like to be a bird and have a beak.	The teacher was promoting systematic reflection. Systematic reflection is a learning procedure in which students analyze their behaviour and connect it to their performance outcomes (Ellis, Carette, Anseel & Lievens, 2014). Systematic reflection contains three functions […]. Self-explanation, when students actively analyze their behaviours in order to understand reasons for their success or failure (Ellis et al., 2014), was demonstrated when the teacher made her students aware, prior to the activity, that they should consider what it was like to be a bird and have a beak.	Macrostructure Change
-	-	The teacher used an activity involving oven mittens and tweezers to help students understand the successes and failures that the size of a birds beak could have on their ability to pick up food.	The teacher used an activity involving oven mittens (large beak) and tweezers (small beak) to help students understand the successes and failures that the size of a birds beak could have on their ability to pick up food.	Meaning-Preserving Change
-	-	Following the activity the teacher used the experiences the children had from the activity in order to help them analyze and reflect upon certain successes and […]	[Deleted]	Microstructure Change
-	-	For example, the students who responded that larger objects were easier to pick up with oven mittens showed that they understood that their behaviour in using a larger tool was the reason for their success in picking up a larger item versus the difficulty picking up a smaller one.	For example, the students who responded that larger objects were easier to pick up with oven mittens showed that they understood that their behaviour in using a larger tool was the reason for their success in picking up a larger item.	Meaning-Preserving Change
-	-	-	Absolute success or failure feedback was provided as students performed the activity. Feedback on the information being […] [Added]	Macrostructure Change

-	-	The teacher put her hands together and stretched her arms out in front of her face to demonstrate a small and thin beak.	The teacher, standing at the front of the classroom, put her hands together and stretched her arms out in front of her face to demonstrate a small and thin beak.	Meaning-Preserving Change
W-U4) *Is this description too conversational? Should I try and discuss more what the teacher is doing while the students answer (body language, etc)?* <Content/ Subject>	R-U8) *The description is great; it's very detailed and explains everything that happened. I don't think you need to add any extra information on what the teacher is doing because what she does in that clip besides modelling the beak with her arms and pointing to the students is not relevant for the analysis.* (adopted) <Positive-Neutral; Confirmation AND; Explanation/ Justification; Content/Subject>	One of her students, after the teacher called out her name for a response, answered "a snake" to which the […] Another student raised his hand to which the teacher pointed to him and prompted him to speak by calling out his name. The student responded with "a worm" to which the teacher repeated the answer in a tone that indicated he was completely […] One student responded "A blue jay". The teacher told the class that that bird does eat worms but there was another bird that they saw yesterday which also eats worms. The next student to respond got the bird correct when she responded "A robin". [No changes were made]	One of her students, after the teacher called out her name for a response, answered "a snake" to which the […] Another student raised his hand and the teacher pointed to him and called his name to prompt him to speak. The student responded with "a worm" to which the teacher repeated the answer in a tone that indicated he was completely […] One student replied "A blue jay". The teacher told the class that blue jays eat worms however there was another bird they saw yesterday which also eats worms. The next student to answer got the bird correct when she responded "A robin". -	- Formal Change - Formal Change Formal Change Formal Change [No change]
W-U5) *Is this a theory? Is there a different theory I could use? I am trying to make the connection about the teacher providing cues that initiate students connecting basic information to one another. Aka: Earthworms (long, thin and slide) + small bird beaks = food for birds like the robin.* <Content/ Subject>	R-U10) Don't need the "'s" (adopted) <Neutral; Correction; Language> R-U11) *Hmm, this one is debatable whether it's a theory or not. I don't really think it is. From my understanding, this analysis is about making students cognitively engage in the material they're learning by connecting it with knowledge they already have. This can be turned into a theory about elaboration.* (not adopted) <Neutral; Explanation/ Justification Only; Content/ Subject>	Bjork & Bjork's (1992) labeled their ideas on how human memory is unlike a computer but needs to actively engage new information with existing information in order to make retrieval easier in the future "important peculiarities" (cited in Bjork, Dunlosky & Kornell, 2013). *[…]"important peculiarities" (cited in Bjork, Dunlosky & Kornell, 2013).*	"Important peculiarities", labelled by Bjork & Bjork (1992), is the idea that human memory is unlike a computer and needs to actively engage new information with existing information in order to make retrieval easier in the future (cited in Bjork, Dunlosky & Kornell, 2013). *"Important peculiarities", labelled by Bjork & Bjork (1992), is the idea that […].* [Kept the same theory]	Meaning-Preserving Change -

-	-	The teacher got her students to consider previous things they new about and saw in order to connect new information that birds with small beaks, like a robin, eat earthworms.	The teacher got her students to consider previous things they new about and saw in order to connect new information that birds with small beaks, like a blue jay or robin, eat earthworms.	Meaning-Preserving Change
-	-	Students were shown how one could connect old and new information so that encoding and retrieval is more effective in the future.	Students were guided on how to connect old and new information so that encoding and retrieval would be more effective in the future.	Meaning-Preserving Change
-	R-U12) ***I think the analysis about the theory starts to get a little off track towards the end when the environmental and teacher's cues come in. The hypercorrection effect makes the student who was corrected of his high-confidence error more likely to remember the correction. So I think you can add something about how that specific student who made the initial error will encode the correction more deeply than other students (because of the effect) and take out the parts about the teacher giving clues.*** (adopted) <Neutral; Identify Problem AND; Explanation +Direction; Content/Subject> R-U13) *Maybe 'susceptible' would be a better word to use here?* (adopted) <Neutral; Identify Problem AND; Direction; Language>	Analysis: The discussion brought about an opportunity for students to […]. Butterfield and Metcalfe (2001) label this the hypercorrection effect, where students who make errors with a high level of confidence actually enhance their learning opportunity (cited in Bjork, Dunlosky & Kornell, 2013). In the scenario above, the teacher called upon one particular student who believed his answer was going to be absolutely correct. When the bird he said was not at all what the teacher was thinking about or describing, a […]. The teacher provided many clues and hints as to what type of bird she was thinking about. The student was able to listen to his […]. In the end of the above scenario, there was a loud response from the class that […] While the majority of the class did not make blatant guessing errors, the environment provided students with examples of incorrect answers that they could then learn from. […] The student that provided a blatantly incorrect answer was most vulnerable to a learning opportunity. The environment the teacher created allowed for students to learn from other's mistakes, some characteristics of the hummingbird.	Analysis: The discussion brought about an opportunity for students to […]. Butterfield and Metcalfe (2001) label this the hypercorrection effect, where students who make errors with a high level of confidence actually enhance their learning opportunity (cited in Bjork, Dunlosky & Kornell, 2013). In the scenario above, the teacher called upon one particular student who believed his answer was going to be absolutely correct. When the bird he said was not at all what the teacher was thinking about or describing, a […]. [Deleted] At the end of the above scenario, there was a loud response from the class that […] [Deleted] The student that provided a blatantly incorrect answer was most susceptible to a learning opportunity and learned that the hummingbird was connected to the characteristics the teacher described.	Microstructure Change Formal Change Macrostructure Change Macrostructure Change
W-U6) *This is from the metacognition* <Content/ Subject>	R-U14) *I think it is!* (adopted) <Neutral; Confirmation ONLY; Content/Subject>	This misaligns with the ease-of-learning judgement, in which teachers ask students to predict their performance before […]	This misaligns with the ease-of-learning judgement, in which teachers ask students to predict their performance before […]	[No change]
-	R-U15) *This is a great proposal* <Positive; Other>	Proposal: One thing I would do differently if I was the teacher would be to […]. Metacognition is a crucial component to learning.	Proposal: One thing I would do differently if I was the teacher would be to […]. [Deleted]	Microstructure Change

Note: W-U: identified Unit in the writer's request comments; R-IU: identified Unit in the reviewer's feedback comments; Italic texts indicate directly cited texts from the writer's essay. Bold texts indicate feedback comments which were selected as a helpful comment by the writer. The writer's adoption of the received feedback was show in the (). The type of each comment was shown in the <>. An addition or explanation which the investigator inserted was show in the [].