Implementation of Peer Reviews: Online Learning

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Abstract. With the increasing use of online learning, many teachers and instructors are using peer evaluations to enhance the students' learning experiences. Peer reviews have shown a wide range of benefits, including increasing competency in the course material, yet there are some limitations stemming from lack of guidance or structure in peer review assignments. A lack of structure has continually been seen across disciplines. This was experienced in an English grammar, online learning course at a Southwestern Ontario university. Working with no clear guidelines for peer review assignments, a Four-Step Model was created that enhanced clarity, direction, and objectivity as well as detailed what students should and should not include when completing a peer review. Subsequent changes to the course were made to accentuate the benefits of peer reviews. The Four-Step Model can easily be adapted to suit any peer-based assignment, regardless of course subject or form of teaching.

Keywords: Peer Review; Online Learning; Four-Step Model

Introduction

The use of technology in the classroom is becoming increasingly popular, and "the growth of online courses does not appear to be slowing" (Atchley, Wingenbach, & Akers, 2013, p.104). The past decade has seen online instruction as a common delivery model in many higher education institutions (Green, 1997). Online learning allows students to complete courses from a number of colleges and universities, and traditional higher education institutions have begun to offer online courses (Brigance, 2011). Further, demographically diverse students, who are an increasing population, want options regarding the delivery of courses they take (Ulrich & Karvonen, 2011). Since online education is becoming a preference for higher education students, colleges and universities

need to adapt or risk losing a share of the market with respect to enrolment, which then impacts tuition money.

In 2000, there were approximately 275 million Internet users globally, and in 2002, this number increased to approximately 605.60 million (NOIE, 2001). It is difficult to determine the exact number of Internet users; however, the number of Internet users is expected to double every six months (Hosie, Schibeci, & Backhaus, 2005, p. 540). When Internet use and education is examined, Bell and colleagues (2002) suggest that by 2025, there will be 30 to 80 million online learners. This range of students (30 to 80 million) is large, since the definition of an online learner may be conceptualized in more than one way. This estimation demonstrates how learning will be delivered, and higher education institutions that do not start to provide online learning now may have to play catch-up in the near future.

According to the literature (see Bell, Bush, Nicholson, O'Brien, & Tran, 2002), one benefit of studying online is that students can self-pace their learning. For instance, students can watch tutorials as many times as they would like if tutorials are a part of that online course; however, this option may not exist in a traditional lecture. Online learning encourages independent learning, and it does not confine students to one location, as students can complete online courses with access to the World Wide Web (Rosenberg, 2001). It can also give students flexibility in their schedules (Dekhane, Napier, & Smith, 2011). Flexibility in schedules may decrease student drop-out rates, as students have more control of when to complete the online lecture.

Watson and Rutledge's (2005) study on student satisfaction asked student participants what they enjoyed most about taking an online course. The following themes emerged: "being able to complete the work at their own pace, convenience/accessibility/flexibility, not having to drive to campus, and being able to complete course work around their employment schedule" (p. 14). These student-identified advantages may provide students with empowerment compared to what a traditional lecture-style course would, as they have more control over their learning regarding when to do the online lecture, being able to stop it, and return to it.

The next section will provide a literature review regarding the potential benefits and limitations associated with incorporating student peer review into courses, as well as instructors' experiences of administrating peer review into their courses.

Literature Review: Peer Reviews to Enhance Learning

Over the last decade, research (see Hu, 2005; Lundstrom & Baker, 2009; Rubin, 2006) has focused on the importance of incorporating student peer review as an assessment strategy to enhance learning. Mittan (1989) was one of the very few researchers who highlighted the various benefits of the peer review process, including how it allows students to receive varying views on their writing while gaining confidence in their ability to write and critically evaluate others' work. Although research is limited in this regard, some researchers have conducted studies to explore the advantages and drawbacks of the peer review process. This section of the paper explores the potential benefits and limitations

associated with incorporating student peer review into courses. It will also discuss instructors' experiences of administrating peer review into their courses to provide new and critical understandings into aspects of university teaching and learning.

Implementation of Peer Reviews: Benefits. Lundstrom and Baker's (2009) research, which consisted of "ninety-one students enrolled in nine sections of writing classes at the English Language Center (ELC) at Brigham Young University" (p. 33), focused on who benefited most from the peer review process: givers or receivers. Students in an upper beginner's course and an intermediate course were each divided into either givers or receivers of peer reviews. Their findings demonstrated that giving feedback on writing was more beneficial than receiving feedback: the givers improved more on their essay scores than those receiving peer reviews. This effect was, of course, mediated by experience: no difference was found between givers and receivers amongst those individuals in the intermediate course group who were familiar with peer reviews. Their study demonstrated the effectiveness of peer review activities, as well as how this process can be very effective in developing student writers, especially at lower proficiency levels (see also Likkel, 2012).

In a study by Liu and Sadler (2003) the researchers investigated the effect and affect of technology-enhanced (Microsoft Word commenting) versus traditional peer review (face-to-face interaction). Their study consisted of 48 students enrolled in a second semester composition course located at a large Southwestern university in the United States. The researchers found that the combination of technology-enhanced and traditional peer review yielded many benefits for students: high motivation, low anxiety, and active participation (among others). However, the researchers found that while students preferred online interactions, the results demonstrated that face-to-face can be more effective, as the nuances involved in body language cannot be mirrored with online discussions. From this study, the researchers concluded that "the use of electronic peer review may serve as an effective tool for the peer review and revision processes" (Liu & Sadler, 2003, p. 221).

This discussion has explored some of the benefits of the peer review process. Aside from the previously mentioned studies, other researchers have also provided some critical insight on the benefits of peer review. In discussing the benefits of peer review, Stanley (1992) stated that peer review encourages students to develop productive attitudes toward writing. Hu (2005) discussed how peer review helps "raise students' awareness of their strengths and weaknesses as writers" (p. 324): it also fosters a sense of text ownership (opportunities for students to explain, defend, and clarify their arguments) (see also Tsui and Ng, 2000). Hu (2005) also argued that peer review provides "opportunities for students to detect mismatches between intended and understood meaning, helping them develop a sense of audience" (p. 324) (for further discussion see Liu and Sadler, 2003; Paulus, 1999). Further, Villamil and de Guerrero (1996) stated that peer review could help establish "the social basis for the development of cognitive processes that are essential to revision" (p. 67). Essentially, the authors highlight how the peer review process can improve the quality of student writing.

Implementation of Peer Reviews: Limitations. Mangelsdorf and Schlumberger (1992) conducted a study to explore the usefulness of the peer review process. Their study consisted of 40 students enrolled in a first-semester freshman English as a Second Language (ESL) composition course at the University of Arizona. Although students' perceived peer reviews as advantageous (e.g., in helping to revise their papers), the majority of the students (77 percent) stated that "peer reviews had neither helped them to be responsible for their improvement, nor to be confident in their ability to critique a text" (Mangelsdorf, 1992, p. 280) (see also Mangelsdorf and Schlumberger, 1992). Also, students consistently mentioned that a limitation for them was trusting in their peers' ability to accurately make revisions. Some students noted that others provided critiques which were not very useful (e.g., vague or complimentary comments). In short, students lacked trust in the feedback they received and questioned its validity.

Some of the potential limitations of peer review have also been discussed by a number of authors. For instance, Villamil and de Guerrero (1996) discussed the potential drawbacks to student peer review, citing limited knowledge of the target language and difficulty in critiquing texts written by peers who have language barriers as examples. Hu (2005) argued that students may "lack the knowledge and skills to differentiate [between] valid and invalid peer feedback and to revise [their writing] accordingly" (p.325) (see also Leki, 1990; Stanley, 1992). Liu and Sadler (2003) discussed how some students tend to provide vague comments (e.g., fix this sentence) when critiquing content, organization, and idea development. When it comes to providing constructive feedback, Nelson and Murphy (1992) explored the implications of hostile, over-critical feedback. Essentially, there may be a fear associated with the peer review process: a fear of being ridiculed by peers due to language barriers, for instance (Nelson & Carson, 1998). Further, de Guerrero and Villamil (1994) noted how some students may react negatively to critical comments: "These attitudinal problems can generate a sense of discomfort and uneasiness among the participants" (Liu & Sadler, 2003, p. 194). Unfortunately, this can result in peer review turning into a damaging activity instead of a constructive one. It is essential to note, however, that carefully designed peer review training can help improve some of these concerns (Hu, 2005).

Executing Peer Reviews in the Classroom: Instructors' Experiences

A current trend in academia is a push to teach students effective communication of the course material (with their peers) in a professional and critical manner, rather than lecturing students who simply memorize information. To facilitate such learning, a promising method is to have students participate in the peer review process (Rieber, 2006; Topping, 1998). Exactly how peer reviews have been carried out in post-secondary classes has been widely diverse, from how often students participate in the peer review process, to the impact the peer reviews have on their final grade. Understanding how instructors approached the inclusion of peer reviews highlights some of the effective aspects of participating in the peer review process.

Mangelsdorf (1992) implemented the peer review process in her first-year composition course. She offered a guideline for how to conduct peer reviews, identifying some key steps for implementation. First, students must be taught

how to conduct a peer review: this is followed by an interactive learning session where the process is modelled by the teacher with the involvement of the students. In this interactive learning session, the instructor would read a fewsample drafts (with student permission granted) and discuss the strengths and weaknesses of the draft, as well as discuss how the student could revise their paper. At this stage, the focus is on content and organization, rather than style and grammar. Then, it is important to practice how to make suggestions for revision, focusing on how to be polite, clear, and specific. After a peer review assignment is completed, Mangelsdorf stated that the instructor should discuss with the class whether the peer reviews were helpful or unhelpful. This early suggestion, as to how to conduct reviews, offers a very basic outline for implementation – Mangelsdorf did not highlight what to teach. This problem has been pervasive as researchers consistently use varying ways to implement peer reviews.

Lundstrom and Baker (2009) conducted peer reviews throughout the semester (on four separate occasions) in order to train students on (1) how to write effective introductions; (2) how to use feedback to revise an introduction; (3) how to give effective feedback on introductions; and (4) how to improve a thesis statement when given a sample essay by another student. Students were asked "to look at the same issues in [a sample] essay [and] were [asked] to revise the paper and provide suggestions on how to improve the paper" (Lundstrom and Baker, 2009, p. 33). "[The] findings may suggest that reviewing peer writing helps students learn global aspects of writing more than does learning how to interpret peer feedback. However, the lesson plans given … focused solely on global aspects of writing, so this result is not surprising" (Lundstrom & Baker, 2009, p. 38). In summary, Lundstrom and Baker expressed the complexity of setting up peer reviews as how to train students, create groups (receivers vs. givers), determine the types of assignments, and how to go about peer reviews, which all need to be taken into consideration. Although their implementation of the peer review process seems useful, it would appear as though it would be a daunting task for instructors to implement into their courses.

Marcoulides and Simkin (1991) used the peer review process for a term paper for 60 students in two sophomore computer classes. Prior to participation, instructors fully explained what was required of the assignment: students had a choice regarding topic, paper length, bibliography, and format. On the day the assignment was due, students were required to grade one another's paper in class. Students marked based on subject matter, content, and writing mechanics. Term papers were reviewed separately by three students blind to other comments and were then collected and redistributed (at random) two more times for reading and evaluation purposes. The researchers found that student raters were reliable in scoring, grading a paper (on average) within 2 points of each other on a score out of 20, and also valid, as the instructor's grade differed from the average of the three grades by 1 point. The authors highlighted that "one finding of the present study is that, when provided with a predefined evaluation form, students are consistent in their overall assignments of grades to papers. Our analysis also reveals that students are not always consistent in the specific reasons or criteria they use to downgrade papers, but only marginally so" (Marcoulides & Simkin, 1991, p. 83).

Rubin (2006) was interested in implementing the peer review process in his business management course. As an assignment, teams of four were required to write a business report. Each team submitted four copies of a draft that was at least 80 percent complete. The four drafts were stripped of identifiable information and circulated to other students in the class. Each reviewer then resubmitted two copies of their review (within a week): one was retained by the professor and the other was handed back to the original group. To make sure peer reviews were optimally completed, recommendations by DeNisi and Kluger (2000), Schein (1999), and Nadler (1977) were followed. First, "feedback should be concrete, specific, and emphasize [description]"(Rubin, 2006, p. 385). To do this, Rubin (2006) asked students to follow four screening questions to complete a thorough review (no verification of this review was reported). Second, feedback should be presented in a non-threatening manner, where constructive intentions of both giver and receiver are present, and negative information is withheld. Here, the instructor coached students with examples of poor, average, and good quality assignments, and he explained to the teams to look for "the nugget of truth" within the reviewers' comments. Third, information regarding how to improve the submitted work must be included in the feedback: this advice was followed by instructing students to evaluate the reviewers' comments and indicate if all comments needed to be incorporated. Finally, there was a reward attached to working with the feedback data. Here, the instructor allotted 5 points (3 percent of the grade) for completing peer reviews. In regards to the effectiveness of this process, Rubin found that students preferred to give rather than receive feedback (this was based on a voluntary survey created by Rubin where 70 percent of the class completed the survey).

Hu (2005) used the peer review process with Chinese ESL student writers. Most students had studied English for six years; however, few had experience in academic writing in English. Students produced three drafts for six writing assignments. For each assignment, the process included the following: (1) writing a first draft; (2) receiving peer review (both oral and written); (3) writing a second draft; (4) receiving teacher feedback; and (5) writing a third, final version for the assignment. The author's first attempt at the peer review process proved to be unsuccessful: students either rushed through the peer review process, or they did not dedicate time to complete the peer review process. Hu (2005) also found that students distrusted their peers' abilities to critique, felt unable to judge valid comments, "focused on language and mechanics in response, expressed comments in inappropriate ways" (p. 331), did not incorporate peer responses, and felt as though there was not enough teacher follow-up with the students' reviews.

To improve the peer review process, Hu (2005) researched and created 13 new training activities with varying aims and functions, in order to raise students' awareness of the importance of giving and receiving peer review. To do this, Hu adopted a 3-step procedure: (1) read to look for meaning; (2) respond to macro issues; and (3) deal with language problems. To improve the major contributing factor of lack of adequate teacher follow-ups to student work, Hu (2005) went from "simply collecting written peer comments [to] marking [the] peer comments, presenting useful and problematic peer comments, responding to

written peer comments, demonstrating how to make helpful comments, [and] providing feedback on peer responses" (p. 336). Moreover, she also checked whether or not the student had included the peer reviews, and if they failed to do so, how it may have disadvantaged them. Hu found that students' attitudes towards the peer review process greatly changed from wanting to discontinue peer reviews during the first year, to appreciating its presence.

One final method that will be discussed is the Calibrated Peer Review (CPR), which was developed by the University of California, Los Angeles' (UCLA) Chemistry Department, supported by the National Science Foundation and Howard Hughes Medical Institute. CPR has been used as a way to integrate writing into classes which have a large number of students (Russell, Chapman, & Wegner, 1998). CPR is an online writing software that requires the class instructor to submit and mark an example of an assignment the class is required to complete. A student can then evaluate the calibrated assignment and compare their mark to the professors', thereby evaluating the peer review performance. CPR has been shown to help students score higher on traditional exams, where CPR was utilized with coursework (Enders, Jenkins, & Hoverman, 2010; Pelaez, 2002; Stokstad, 2001).

Likkel (2012) incorporated CPR into her introductory astronomy course (Survey of Astronomy) at the University of Wisconsin–Eau Claire. The participants in her study were students in three sections of her course: one section used the CPR system, whereas the other two did not use the CPR system. She found that the class that used CPR had a better idea of a well-written essay, had a better perception of the peer review process, and had a better "perception of their ability to evaluate their own [writing]" (Likkel, 2012, p. 42). Similarly, Hartberg, Gunersel, Simpson, and Balester (2008) also compared two sections of their senior-level biochemistry course, where they compared CPR feedback with Teaching Assistant (TA)-generated feedback. Students were required to submit research abstracts, including a background, methods, results, and discussion sections. In comparison, receiving TA-feedback produced a decrease in quality of abstracts submitted, while CPR improved abstracts. Moreover, TA-feedback only outperformed CPR on the background section of the abstracts.

Peer Review Development at a Southwestern Ontario University
Ambiguities: Unclear Guidelines
An online English course was implemented at a Southwestern Ontario university over a decade ago The course was introduced to help university students develop effective writing skills for communicating ideas in academic and other contexts (the topics covered include grammar, the audience, the writing process, and peer reviews). In the early stages of this online English course, peer review marking was unstructured and students were given few guidelines. Although peer review assignments were graded out of ten (five for submitting a draft on time and five for the quality of peer review feedback), the criteria for specific marks was not provided. For instance, to receive a mark of 10/10, students needed to submit their draft (worth 5 marks) and then provide several pieces of constructive criticism (worth the other 5 marks). Since

"several" was not defined, the number of constructive criticism comments needed was interpreted differently by TAs when grading. This created issues regarding the standardization of marking. It was not uncommon for students to complain that they had received a lower mark than a peer in the course, yet provided the same number of constructive criticism comments. Students did not have explicit guidelines outlining what was expected from them.

The students were not provided with a substantial amount of information on the peer review process. It was not uncommon for students to ask several questions regarding how to effectively review others' work. The peer review information that was available to them consisted of a few websites that were posted in the online class platform. These websites briefly discussed some do's and don'ts when participating in peer reviews, such as "do use polite language" and "do not belittle the author." Although students were asked to read and apply the information on these websites, they were still unaware of how exactly their peer review assignments would be graded. Not knowing what was expected caused frustration for some students, and, in turn, some may have opted not to complete these assignments altogether. Further, students reviewed four anonymous random assignments and provided feedback that varied in quality, accuracy, and number of comments due to vague instructions.

Similar to students, the TAs were unclear about how to mark peer reviews, and many were not confident with their grading of these assignments. These TAs received similar vague guidelines for peer review marking during the TA orientation meeting for the course at the very beginning of every semester. Without clear structure, the TAs eventually created their own marking guidelines, and due to the lack of standardization in marking these assignments among TAs, it was not uncommon for TAs to remark assignments after learning other TAs may be marking "easier." For example, some TAs focused on how many reviews were given as grading criteria, while others focused on usefulness of reviews. This, in turn, could bias the final class average, as TAs may have given inaccurate grades based on factors irrelevant to the actual grading process; for example, TAs giving higher grades to students who would not complain to the instructor or giving lower grades to students who visited the TA during office hours and came across as hostile.

Developing the model

To create a more structured marking rubric, TAs, at times, would consult with each other on how to grade peer reviews according to the marking scheme, but were often confused due to the many inconsistencies in marking. As this situation became more apparent, and to create a more standardized version of a marking scheme, criteria were sought after that would be important for a standardized set of rules for marking a peer review. The decision to create a

standardized marking scheme for peer reviews was initiated as few guidelines were available. After an extensive search, the only resources that were found included general tips and broad categories that failed to provide specific details on how to meet such criteria. To create an objective marking scheme, the course TAs were consulted due, in large part, to their experience with marking peer reviews and the creative ideas that some had adopted in their marking criteria. TAs shared feedback regarding what they thought were necessary criteria for a peer review and what would be helpful for the authors of the assignments. After receiving feedback from many TAs, a list of over twenty recommendations was compiled. These recommendations were organized into two separate areas: items of commission (statements that should be included but often are not) and items of omission (statements that should not be included but often are). For clarity, each peer review grade was assigned to how much of the commission and omission lists were adhered to, such that a "great peer review" would include all of the items in the list of commission and no items in the list of omission.

The list of commission revolved around removing confusion for the students receiving the feedback. Moreover, the student who is critiquing understands the nuisances of his or her comments, while the receiver may not. Further, the student writing the review and the receiver often differ in their depth of understanding of the multitude of areas within the course. The peer reviews given at the time often did not help improve an essay (or paragraph) due to the lack of guidelines and understanding of how to complete a peer review. The major concerns that most often were reported by students were clarity, direction, and objectivity. Clarity became an issue when the receiver was not able to determine where the error was, what the error was, and why the issue was an error. Students were allowed to write their comments below the author's work, but sometimes did not reference the location of the error in each of their comments. Another example regarding lack of clarity was when students would give vague explanations when commenting on an issue, for example, by stating that the error was a "comma error" without explaining which of the many rules for comma usage was broken; even if a specific rule was mentioned as being broken, how that applied to the author's work was often lacking.

Clarity helped the receiver of the feedback understand what the error was, but understanding the error is only half the solution. Students who understood the feedback, but did not understand how to change the error, were left directionless. Giving guidance on how to improve was imperative. This was done by having the students include in their reviews specific examples on how to fix the errors and not just general or rote instructions, as in the often used and limited instruction to "remove the comma." Offering specific and guided instructions also enhanced the objectivity of the critique. If the student writing the peer review could actually show the correction, the greater the chance was that the student knew and understood the rule under revision (though this was not always the case). To enhance objectivity, a useful inclusion was a page reference to the course guide indicating where the rule was to be found. Although this might seem tedious, the nature of the course was an introduction, and students would be referring to their guide to find mistakes to begin with. Including the reference page gave the reviewer greater credibility but also

provided the receiver with a chance to quickly determine whether the correction is legitimate. For first year students, this was of particular importance, as students often found it difficult in determining the legitimacy of a review.

The list of things to not include in a peer review was based on removing confusion but also in ensuring standards and professionalism. This meant that along with the restriction of adding in subjective reviews was the restriction to not include any disparaging or derogatory comments, thereby eliminating comments such as "you have been careless in your work, as you have committed the same mistake three times so far." Although the author may have been careless, the reason might have been a misunderstanding or lack of understanding of the topic, which is insight the reviewer is not privy to.

The Four-Step Model

These two lists worked well for about a year, until the lists were brought to the attention of the head TA. The lists were integrated into the marking scheme for all TAs to use and resulted in a step-by-step model (See Table 1) that established clarity, provided direction, and shored up credibility. Another important reason to create a simple framework was for better adherence by students in their peer reviews and by TAs in their marking.

Table 1: The steps in the Four-Step Model

Step 1	Identify the error (specify to the author where the error is located)
Step 2	Explain why it is an error
Step 3	Show the author how to correct the error
Step 4	Reference the page in the [appropriate guide/manual/textbook] where the rule is found

The model shown gives clear instructions to help students provide the most useful comments when critiquing. Students receive marks by adhering to the model. Although absent from the model, another list of faults was compiled that negated marks received (see Table 2). This list consisted of six items focusing on ensuring the model would be followed in a professional and accurate way.

The first in this additional list of requirements was to ensure that no spelling mistakes were found in the peer review comment. The nature of the course was to improve the spelling and grammar of the undergraduate populace. As such, when correcting another's error, the least the student must do was ensure the spelling in the comment is correct. Next, students were required to avoid using language that would criticize the work or the person. Following this, students were not permitted to give opinions in their comments. This restriction was included as an opinion brought unnecessary subjectivity to the review. Opinions were determined depending on the wording of the comment; for example, students were required to use absolute language, such as "this is an error" or "this period does not belong here" and avoid phrases demonstrating uncertainty, such as "I think . . .," "Maybe . . . ," or "In my opinion . . ." Again, from the perspective of the receivers of the peer reviews, students receiving feedback cannot be confident in implementing the correction when those critiquing are not sure of what they are marking. An opinion undermines the validity of the comment.

The first three items in the list consisted of things to avoid including in a comment, whereas the last three refer to what should be included in the comment. The fourth in the list stated that students must use proper terminology. This was included to help remove ambiguity by changing vague terms to more informative ones, such as changing "comma error" and "too long of a sentence" to "comma splice" and "run-on sentence." Students were also required to provide ample indication of where the error is located to the receiver of the peer review. There should be no doubt to the receiver as to where the error took place. Finally, the last item in the list of things the peer reviews should include was to only correct an error that needs correcting. Although similar to the notion of not giving an opinion, this facet focuses on a correction that has no legitimate basis. For example, students might correct the make-up of a sentence, citing improved flow in the sentence as justification. This may or may not be correct but creates unneeded difficulty, as there is no clear rule to follow, and that was above the level of the introductory course with a focus on basic grammar.

Table 2:List of six additional requirements for each comment

1. Not have spelling mistakes in the comment
2. Not be degrading or detrimental in the comment
3. Not give an opinion as a correction
4. Use proper terminology
5. Indicate clearly to the student where the error is located
6. Avoid correcting something that does not need to be corrected

Positive Constructive Comments

In the development stage of the model, a concern arose when students could not legitimately locate any errors in a narrative. The positive constructive comment was endorsed to provide an avenue where students were still required to practice the model and offer helpful feedback. The Four-Step Model was adapted for this particular comment as in Table 3. Some students might have found the point of this comment inconsequential, but many students coming into the course lacked the basic understanding of many grammatical concepts. The positive constructive comment forces students to still apply the rules they learned in the course and creates an environment of repetition to hone one's grammar skills.

Table 3: The steps in the four-step model for positive constructive comments

Step 1	Identify the rule that was correctly followed (specify to the author where the is located)
Step 2	Explain why it is correct
Step 3	State that no correction is necessary
Step 4	Reference the page in the [appropriate guide/manual/textbook] where the rule is found

The Peer Review Guide

Although these steps and requirements seem obvious to include (or not include) in a review, many students do not have the experience or skills yet to ensure that

these steps are followed. A guide for the course was created to teach the theory behind what makes an effective peer review, answer potential questions, and offer a plethora of practice examples for all skill levels. The guide included a section on the how-to of writing a peer review for the course (the guide was tailored to the specific course), the advantages of participating in the peer review process, the outline of the model, the need for the list of additional requirements, the use of positive comments, definitions, and practice questions with an answer key. The practice questions include true-or-false, multiple-choice, progressive fill-in-the-blanks, and a critique using the model of a short essay (see Appendix 1 for examples). Each student is required to purchase a peer review guide as a text for the course. These activities are assigned to students prior to completion of the first peer review assignment. Although the activities are assigned, they are not graded. It is the students' responsibility to complete the practice activities and check his or her answers.

Similar to the students, the TAs are provided the same peer review guide. The TAs are required to read this guide at the beginning of the semester. When the peer review guide was implemented into the course, TAs reported that they felt more at ease with marking these assignments, since they had a marking scheme to follow. With a standardized marking scheme, the TAs guessed less when marking since it was now objective. Also, they had a resource to refer the students to for additional help. Prior to the model, the TAs would spend additional time explaining to students via email what they felt is needed to receive a decent mark on these assignments. After this model was designed, the TAs could refer the students back to the model and provide page numbers as well.

Marking

With an easy-to-follow guide and a clear model, marking of peer reviews transformed from a subjective experience to a more objective experience. The marking scheme was changed to reflect the importance of completing the peer reviews. The formula developed was 10 marks for submitting a draft and 5 marks for each draft that must be critiqued. In the course, students were required to review 4 drafts, resulting in each peer review assignment worth 30 marks (10 for submitting a draft on time and 20 marks for the reviews). In each draft, students were required to complete five positive constructive comments, each comment worth one mark. Later, this grading was changed slightly, as each of the four steps in the model were worth .25 marks, allowing for part marks if the student did not follow one of the steps. This also gave greater clarity to the student when attempting to understand why he or she lost marks, as the exact steps that were not included or were incorrect were highlighted. Positive constructive comments were only allowed when less than five errors in a document could be found. Any errors that were located had to first be corrected before the positive constructive comments could be used. The time required to complete the peer reviews and their marking was greatly extended, but the course was adapted to allow for this extra time by removing an assignment. This decision was made due to the importance placed on providing effective peer reviews.

Validation from the model was not explicitly tested but was indicated through TAs' consistent grading, as well as an abundance of helpful reviews for authors. This was evident through comments from TAs on the greater quality of students' work they had witnessed and through fewer complaints regarding discrepancies in marking between TAs. After the implementation of the Four-Step Model, many reviews were more constructive than before the change in the marking scheme. The requirement to follow the model did not improve all reviews after implementation as some students produced low quality work by failing to follow the model and its additional requirements. Although the model did not improve the quality of these students' reviews, the model allowed TAs to assign low grades to those students, resulting in greater consistency and objectivity to the marking.

Overall, the model and the guide have strengthened peer reviews in the course.. They provide an understanding of what is required from students and how students will be graded with the opportunity to practice these skills. The TAs are provided the exact same information and trained to use them. Less confrontation regarding the grading of these assignments has arisen, since the guide clearly outlines the marking scheme. When the model is followed, peer reviews are are far less ambiguous. These points give some indication of the validity of the model.

Conclusion

The Four-Step Model, which has been presented in detail in this article, is certainly adaptable. Although the Four-Step Model is presented in written form, it can be used orally in a variety of educational and professional settings, for example, in primary, secondary, and post-secondary education, in laboratories, or in a number of other business settings as well. The Four-Step Model can be best described as a universal model: a grade school geography teacher could implement this model when asking students to create legends for maps; a chemistry high school teacher could create group review projects for laboratory assignments that require students to use this model; university (or college) professors could implement oral examinations in their courses utilizing this model; and professionals could use this model to critique a business plan, for instance. In essence, any project requiring a critique from peers can use this model. The model is useful in critiquing reading and writing skills, but it can be a useful tool in other areas to formulate and communicate constructive feedback, as well as to gather and respond to feedback. Essentially, this approach to peer review provides an opportunity to teach critiquing skills (reading, writing, and how to collaborate effectively) to students, workers, and professionals in academic and non-academic settings.

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