Critical Research Review #2

Problem
1. *Identify the clarity with which this article states a specific problem to be explored.*

The authors of the study identify two problems as the purpose of their study. The first problem is identified as a lack of critical and higher-order thinking through online discussions (Ertmer et al., 2007). The second, while mentioned later on in the paper is identified in the following sentences, "That is, due to a lack of feedback, students in online courses are more likely to disconnect from the material or environment than students attending face-to-face courses (Ko & Rossen, 2001). While instructor feedback is often cited as the catalyst for student learning in online environments, lack of feedback is most often cited as the reason for withdrawing from online courses," (Ertmer et al., 2007). In other words, the absence of feedback is linked to the withdrawal of students from engaging with the content of the learning environment.

The clarity in which these problems are outlined in the paper are interesting. The location of each problem in the paper is confusing. While the first problem is located at the end of the introduction, the second problem is located further down in the paper in the first paragraph of the section titled Role of Feedback in Online Environments. These problems being stated pages apart leads to a confusion of why this study is necessary. However, each problem is stated in a concise, clear manner making them identifiable and easily understood.

2. *Comment on the need for this study and its educational significance as it relates to this problem.*

Within the first sentence of the paper, the authors identify one of the major components of online learning environments is the use of discussions between students (Ertmer et al., 2007). With online environments becoming more prevalent, the authors point to the quality of the discussion posts being a point of contention. To address the concern, the use of peer feedback is suggested by the authors as a means to increase the critical and higher-order thinking responses. These arguments made by Ertmer et al. (2007) all point to the need for the study as a result of the lack of research in these areas citing:

> While feedback has been demonstrated to be an effective strategy in traditional learning environments, limited research has been conducted that examines the role or impact of feedback in online learning environments in which learners construct their own knowledge, based on prior experiences and peer interactions. Additionally, very few, if any, studies have examined the impact of using peer feedback to shape the quality of discourse in an online course (Ertmer et al., 2007).

The lack of research in this area leads to a study that highlights the purpose outlined by the authors. In terms of significance, the findings of this study may provide insight for higher education institutions who implement online discussion boards as a feature of their online learning environments. Further, higher quality discourse findings as a result of this study could lead to future research on specific feedback strategies from both students and faculty and their implementation in online learning environments.

3. *Comment on whether the problem is "researchable"? That is, can it be investigated through the collection and analysis of data?*

The problem highlighted by the authors of this study focuses on two key components as highlighted in the research questions including student perception of giving and receiving peer feedback,and the impact of peer feedback on the quality of online discussion posts. Ertmer was also a contributor to a similar study last in the year by Richardson et al. (2007). This study focused primarily on the improvement of critical thinking skills

as opposed to students' perception of peer feedback and found similar findings to that of this study, increased student perception and improvements of discussion post quality (Richardson et al., 2007). Other studies have looked at these factors in combination as well. A study from Mwalongo (2013) attempted to focus on both of these components through qualitative data collection. This study found students perceived peer feedback positively amongst the online discussions and found the quality of the discussion posts showed moderate improvement, though this could have been increased with the role of the instructor as a facilitator more prominent (Mwalongo, 2013). Ekahitanond (2013)'s study found that the inclusion of peer feedback increased post-test scores and promoted improved critical thinking skills. Students were also found to have positive perceptions of the learning experience of discussion boards, when peer feedback was included, through a post-study questionnaire (Ekahitanond, 2013). Looking through the few studies included above, it is clear in the years following Ertmer et al. (2007) studies have researched these same components. While the instruments and methodologies differ across them, the combination of qualitative and quantitative data is consistent amongst the findings. As a result, this problem is able to be investigated through the collection of data and analysis.

Theoretical Perspective and Literature Review
   4. *Critique the author's conceptual framework.*
   The authors' conceptual framework for the study is primarily focused on the strategy of peer feedback and its relation to student performance. Ertmer et al. (2007) begins by defining feedback as, "anything that might strengthen the students' capacity to self-regulate their own performances'" (Nicol & MacFarland-Dick, 2006). They elaborate on this concept with seven key points as to what attributes to effective feedback for students including delivering high quality information, clarifying performance indicators, and providing information for teachers to structure their instruction around the needs of their students. This outlining sets up the basis for not only what feedback is defined as in this study, but directly around what feedback should look like among the participants in the study. The authors further this point by then discussing how feedback plays a role in instruction, specifically online instruction. Feedback is highlighted as crucial for online learning environments as it can often lead to withdrawal of engagement and investment from students, according to the authors (Ertmer et al., 2007). This concept is crucial for the study as it indicates the purpose of feedback as a catalyst for online discussion postings. Feedback can address the ongoing issue of engagement in online learning environments, specifically discussion boards which are commonly a feature of these environments. These connections lend to a clear vision for the study and a better understanding of the purpose of the study. The strongest aspect of the conceptual framework is the comparison of the benefits and challenges faced when implementing peer feedback. While instructor feedback has been consistently researched as a benefit to student learning, peer feedback does not contain the same depth of research. The framework established feedback from peers is not as conclusive as from instructors. The purpose of the study is supported through these concepts and in-turn established a connection of the central ideas crucial to this study.

   The authors lack in their analysis of online discussions as part of the conceptual framework. As much as feedback is crucial as the dependent variable in this study, only brief mention of online discussion postings through the lens of instructor feedback is made throughout the literature review. The paper would benefit from a look into the literature of discussion postings and why this form of instruction is often chosen in online environments and the potential benefits students may see in participating in online discussion postings. A link to the social learning theory would also permit an overlap of strategies where peer feedback and discussion posts intersect their benefits and support of students' learning. While the framework for feedback as a strategy is thorough, the absence of discussion postings as part of the conceptual framework is a missed opportunity from Ertmer et. al, 2007).

5. ***How effectively does the author tie the study to relevant theory and prior research? Are all cited references relevant to the problem under investigation?***

Building off of #4, the authors' omission of a discussion regarding online discussion postings leaves more to be desired. Previous research could have supported the focus of peer feedback in this modality of learning specifically as compared to other components of learning environments. That said, the authors' connection of feedback to the online environments through the literature is strong and permits an effective use of previous literature. This is exemplified in Ertmer et al. (2007)'s use of Nicol and MacFarland-Dick (2006)'s understanding of effective feedback. Further, the authors tie the role of feedback in learning environments to a variety of papers (Driscoll, 2000; Higgins, Hartley, & Skelton, 2002). These findings are relevant to the literature review and establish the basis of feedback as a strategy in learning environments.

A mention of the findings from Notar, Wilson, and Ross (2002) regarding the effectiveness of feedback in instruction is included in the discussion of specifically learning environments. This inclusion appears misplaced and would be better suited in the prior section regarding feedback in instruction, from a general consensus. The remaining studies in regards to online environments and the use of feedback are appropriate and address key ideas including the challenges among instructors to provide timely feedback within these environments. However, the authors provide a solution to this predicament citing, "One possible solution is for instructors to capitalize on peer feedback as an instructional strategy, requiring students to provide feedback to one another while simultaneously encouraging greater levels of interaction" (Ertmer et al., 2007). This proposal is the precipice for the study, though the inclusion of a study in support of this as a viable solution would support this proposal further. The authors also provide several pieces of literature to support valid concerns and limitations of peer feedback including inflated/deflated scores from students and difficulty explaining complex ideas and concepts through online discussion (Topping, 1998; Tunison & Noonan, 2001). These acknowledgements from the literature support the study and are relevant to the purpose of the study.

Ertmer et al. (2007) omits a connection to relevant learning/motivational theory when discussing peer feedback. As discussed prior, the omission of a discussion regarding online discussion postings is a missed opportunity to tie the concepts discussed in the literature to relevant learning theory. The use of peer feedback closely aligns to social constructivism in allowing students to build their knowledge off of their peers in learning experiences. This is supported in Knapp (2019) citing, "In a social constructivist classroom, faculty structure this learning process through peer interaction so a collaborative learning process occurs among status equals." This opportunity would have strengthened the use of peer feedback in online learning environments as an effective means to improve student learning and their perception of their own learning.

6. ***Does the literature review conclude with a brief summary of the literature and its implications for the problem investigated?***

While the literature review itself does not contain a brief summary at the end of the section, a summary of the literature review is included in the paper in the first paragraph of *Implications and Conclusion*. This would be better suited at the end of the literature review prior to discussing the study itself. The implications of this summary for the problem investigated are clear. The authors highlight the role of peer feedback in online discussion combatting the challenges instructors and students alike face in these environments. This ties into the purpose of the study and addressing the perception of peer feedback from students' in online discussion boards. While the literature review addresses the impact peer feedback may have, it contains a lack of focus towards the quality of online discussion posts, a major focus of this study. By including the impact of peer feedback on discussion post quality for students, the summary would align appropriately to the problems and research questions proposed throughout the paper. Further, the absence of student perception of peer feedback in the summary creates a disconnection of ideas relevant to the rest of the study. An inclusion of the student

perception in the summary would reemphasize the potential benefits of peer feedback when included in online discussion formats.

7. ***Evaluate the clarity and appropriateness of the research questions or hypotheses.***
    Ertmer et al. (2007) outline three research questions for this study:
    1. What is the impact of peer feedback on the quality of students' postings in an online environment? Can the quality of discourse/learning be maintained and/or increased through the use of peer feedback?
    2. What are students' perceptions of the value of receiving peer feedback? How do these perceptions compare to the perceived value of receiving instructor feedback?
    3. What are students' perceptions of the value of giving peer feedback?

The three research questions listed outline different goals in terms of what the study is looking to find out. Each question is unique while remaining connected in the overall purpose of the study. The clarity of the questions proposed are somewhat confusing in that multiple questions are being proposed and asking for various answers. For example, RQ1 asks for the impact of peer feedback on discussion posting quality while including a follow up question asking if the quality of the postings can increase. While this is derived from the literature review, the questions could be framed more concisely to reflect the purpose of the study. Another way this could have been framed is: *Does the inclusion of peer feedback in online environments increase the quality of students' discussion postings?* RQ2 and RQ3, while relevant in regards to the purpose of the study, are not directly derived from the research included in the literature review. The literature review makes mention of student perception of peer feedback, though they do not feature student perception of peer feedback as part of the conceptual framework outlined in the literature review. This creates a disconnect from the literature as a foundation of this study and the questions the study seeks out to answer. A deeper discussion to student perception according to prior research would further support these research questions and align the study to prior literature.

Research Design and Analysis
8. ***Critique the appropriateness and adequacy of the study's design in relation to the research questions or hypotheses.***
    The study's design is an exploratory study focused on the intricacies of peer feedback in online environments. The literature review identifies the problem being investigated as one without the backing of much research, requiring further inquiry. This is a result of most studies regarding peer feedback being done in traditional learning environments. Ertmer et al. (2007) reflect this in their choice of both quantitative and qualitative data as measures of quality and student perception. As a result, the choice of an exploratory design is appropriate for this study. In addition, the research questions identify various facets of peer feedback (its impact on discussion post quality, students' perception of giving/receiving peer feedback, students' perception in comparison to instructor feedback) making the use of a case study an appropriate design for this study. These choices align to the research questions identified by Ertmer et al. (2007), and do adequately provide answers to the proposed questions, despite their clarity.

9. ***Critique the adequacy of the study's sampling methods (e.g., choice of participants) and their implications for generalizability.***
    15 total participants were chosen for this study. All students were a part of a technology integration graduate-level course. This appears to be a use of convenience sampling as the participants appear to be chosen

from the same university as the researchers, though it is never explicitly stated. I question the participants chosen for this study in relation to the problems identified previously. Ertmer et al. identified a problem in the lack of critical thinking when participating in online discussions. College students, especially at the graduate level, largely have previous experience using online discussions to engage in discourse with their peers. Further, critical thinking skills are often more common at the graduate level which is an expectation of these students. When considering the generalizability of this population, it is limiting as these attributes are not common among the larger population of students. The choice to also use participants from a technology integration education class is also confusing. The participants of a fashion undergraduate course may have a different experience and produce varying results. As a result, the chosen participants from this setting limit the possible findings for other disciplines and learning environments.

10. **Critique the adequacy of the study's procedures and materials (e.g., interventions, interview protocols, data collection procedures, instruments).**

Data in this study was collected qualitatively and quantitatively through interviews, scores provided on the weekly discussion posts, and the pre and post-surveys based on participants' perception of peer feedback. The research team made the decision to score the discussion posts using a rubric designed by themselves, which was also given to the students throughout the study when giving feedback. This decision helped secure a reliability within the results and the rubric's consistency among the feedback allowed for any impact on student's quality to be evident. The research scorers consisted of two individuals who scored each discussion question independently and then compared with the other following the completion of 10 posts. This method of scoring was effective in securing adequate results as it ensured to remove sole subjectivity from the interpretation of the rubric by not only comparing it between the researchers but also between the students' evaluation.

One point of contention with the procedures mentioned is in reference to the timing of the feedback provided. The authors made a point to remove timing identifiers from the postings including posting dates and times. One of the major components discussed in the literature review is the benefit of good, constructive peer feedback that is timely is in the cognitive engagement in the content (Higgins, Hartley, & Skelton, 2002). By removing the timing indicators, the ability to effectively evaluate the feedback provided is removed and therefore suspect to question.

Timing is also an issue when considering the other instruments used to measure student perception of peer feedback, specifically the pre- and post-survey provided to the participants. Students began providing peer feedback to two discussion questions each week beginning in week 7, continuing for the following six weeks, ending at week 13. However, the post-survey was not administered at the end of week 13, but rather at the end of the semester in week 16. The timing of the post-survey is open to biased data in that students' perceptions may have changed depending on their overall performance in the course, as opposed to the perceptions of the feedback throughout the duration of the peer feedback period. Students who performed well by the end of the semester may have had a more positive perception of the experience and the feedback provided and given. Further, the removal of peer feedback following week 13 may have altered the participants perception and influenced the data points in a way that is not shown in the findings from the authors of this study.

Ertmer et al. (2007) do take strong measures to ensure the instruments used are appropriate including the survey's mix of the Likert scale and open-ended questions. Accompanied with participant interviews, these measures ensured that students were able to express their perceptions in multiple instruments with room for context to be provided. They make a point of this methodology stating, "...results were then triangulated with ratings collected during participant interviews, which were conducted several weeks after the peer feedback process had started. Participants' perceptions of the value of the process were compared across open-ended

survey questions and interview responses" (Ertmer et al., 2007). The triangulation of these results supported the validity of the study's findings and ensured that the results are consistent among the multiple measures.

11. Critique the appropriateness and quality (e.g., reliability, validity) of the measures used.

Building off the previous mentions of multiple measures, validity and reliability of the results is a point of emphasis for the authors of this study. The triangulation of the findings were intended to secure the validity of the study and are effective in doing so. Another point of emphasis in the validity of this paper is in the application of the rubric. While all participants were required to use the rubric when providing feedback to their peers, the application of the rubric may have differed according to the participant. The authors combat this concern with models of appropriate responses according to the rubric and allowing the instructor to provide the initial feedback for the participants to refer to. These steps to secure validity were effective in providing a standard of rubric use, though they are aimed to limit validity concerns as much as possible.

The reliability of this study appears to be strong as well, though there may be concerns in reference to the participants of the study. All participants had an education background and were familiar with the use of a rubric. The participants also were familiar with Bloom's taxonomy, the basis for the rubric used to score the discussion postings. The rubric was able to produce consistent results over the six weeks and was able to be used universally among the researchers and the participants. That said, had the participants been of a different background or unfamiliar with the use of the rubric, they would be reliant on the training methods (models, instructor's initial posts) to apply the rubric as intended. This could create inconsistency in the scoring of discussion posts and lead to findings unreliable in future studies. Further, students reported challenges in using the rubric due to the lack of specificity in Bloom's Taxonomy. This creates concerns in validity of the scores provided in addition to the reliability that these scores could be produced consistently amongst a variety of individuals.

Interpretation and Implications of Results
12. Critique the author's discussion of the methodological and/or conceptual limitations of the results.

The author's discussion of limitations outlines several limiting factors for the study. The author identifies the small sample size as a limitation of the study, though does not propose an appropriate amount for future research. Other limitations identified in this section include the length of this study in addition to the size of the rubric scale used being preventive of further display of improvement throughout the study. These limitations are valid and could provide a clearer insight on the impact of peer feedback on discussion post quality. These limitations are clearly outlined within the limitations section and align to the methodology of the study's instruments and measures used.

Ertmer et al. (2007) does omit several other limitations, however. For one, the sampling of the participants limited the generalizability for the study to other disciplines. By including all education-disciplined individuals, the transferability of these findings may not be applicable to other disciplines otherwise unfamiliar to Bloom's taxonomy and rubrics. Further, this is evident in the scores provided from the graduate level participants. According to the findings of the study, a "0" was only given by participants 7 times of the 160 discussion postings (Ertmer et al., 2007). This indicates one of the two things: (1) students were apprehensive to assign lower scores to peers as a result of social factors or (2) the quality of postings from graduate level students is anticipated to be higher due to the quality of work expected among these individuals. As a result, the ability to measure growth amongst the postings is difficult when the quality of the postings is already naturally higher than that of a secondary or undergraduate student. The rubric used, while appropriate for the content discipline, seemed to be a great challenge for the participants. Participants cited the rubric's basis in Bloom's Taxonomy as "vague" and "wide-open" while another participant even stating they, "often just settled on using

the top level (evaluation)" due in large part to their confusion of which level of Bloom's Taxonomy would be appropriate (p. 425). These concerns in the use of the rubric could create issues in the validity of the results, as highlighted earlier.

Another limitation identified in the study is in the administering of the pre-survey. Only 12/15 participants returned the pre-survey which could skew the results of the post-survey when identifying change. Being that the sample size is already a significant limit on this study, the absence of 20% of the pre-surveys when identifying improvements in quality and perception creates a challenge in accuracy of the results.

13. How consistent and comprehensive are the author's conclusions with the reported results?

The authors share the perceptions of feedback that had improved positively as a result of case study, through the pre- and post-surveys. While the results indicate this improvement, the amount of improvement is under consideration being that only 12/15 students were able to return the pre-survey. This creates a potential misrepresentation of the consensus improvement, or lack thereof, in regards to student perception of the peer feedback in online environments.

The authors also make note of the lack of improvement in discussion post quality amongst the participants. While there was no improvement in the quality, they remained neutral throughout the study, which the authors attribute to peer feedback. They cite, "Although the quality of students' postings did not improve with peer feedback, neither did it decrease; suggesting that peer feedback may be effective in maintaining quality of postings, once a particular quality level has been reached," (Ertmer et al., 2007). I find this conclusion misleading as the authors attribute the non-impact of peer feedback to a continuance of quality. To identify if peer feedback is able to maintain discussion post quality, the authors should have removed the variable of peer feedback from the study to identify if the quality of participants' posting decreased. The authors even elaborate on this idea claiming, "While significant changes in the quality of postings were not evident as a result of peer feedback, interview comments suggested that students (n = 8) used information obtained from the feedback process to improve the quality of their postings," (p. 422). This comment speaks more to perception from participants rather than significant improvement in discussion post quality as the participant discussed their own metacognition in their discussion postings. As a result, this discussion of the results is misleading to the reader and should be clearer.

Other conclusions are consistent with the findings of the study. The findings pointed to no change in the perception of instructor feedback vs. peer feedback and this is reflected in the discussion of results. As a result the authors highlight the importance of students' perception and addressing concerns at the beginning of course or discussion posting. This discussion is aligned to the literature and consistent given the findings of no change in perception with students favoring instructor feedback more.

14. How well did the author relate the results to the study's theoretical base?

Ertmer et al. (2007) ties the findings to the theoretical base of the study at several points. A clear example of this is in the discussion of the results regarding instructor vs. peer feedback. The authors identify their findings are aligned to the previous studies of Ko and Rossen (2001) and Topping (1998). This is also evident in the discussion of anxieties felt by some of the participants. This was acknowledged within the *Challenges of Peer Feedback* section of the literature review and is acknowledged in conjunction with the

findings of Palloff and Platt (1999) and Topping (1998). In the discussion regarding giving feedback, the authors acknowledge the benefits experienced by students including reflection of their own postings when evaluating others' and what constitutes 'high-quality' work. The findings are aligned with themes in Henderson, Rada, and Chen (1997) and Topping (1998). These ties back to work highlighted within the literature review create a strong connection of the findings to what has previously been found in the literature.

15. *In your view, what is the significance of the study, and what are its primary implications for theory, future research, and practice?*

The study proposes interesting questions at a time where online learning had not seen the 'boom' period so-to-speak post-covid. It can be argued that this study opened the door to other studies of similar notion, as highlighted in the researchability of this specific problem. Studies have aimed to answer similar questions proposed by Ertmer et al. (2007) like student perception of peer feedback and the impact peer feedback has on quality of performance in online learning environments. Being one of the earlier studies of its kind, it lends credence to this study being significant in peer feedback literature. However, its implications are weak in the consensus of literature. This study fails to truthfully add anything new to the conversation as highlighted in their own literature review. While it reaffirms central themes of perception of peer vs. instructor feedback, it does not contribute new findings to improving the quality of student work in online learning environments. This is also specific in the context of the participants chosen. Though the participants had their own struggles and challenges in scoring postings using the rubric, there are no attempts to generalize these findings to other learning populations. These factors contribute to this paper being one of significance in the overall literature of peer feedback but weak in implicating anything new to the conversation of peer feedback.

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