PEER FEEDBACK: BLINDED OR NOT? A CASE STUDY FROM A UNIVERSITY TEACHER TRAINING COURSE

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Track: IS Education in a Digital Business Process Transformation Perspective

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Abstract

The study explores the preferences and attitudes of learners in a free-selection, double-blinded peer review learning activity. A total of 58 doctoral students enrolled in a university teacher training course participated in the study by (a) designing a learning activity for the courses they were teaching, and (b) providing peer feedback on their work. Students evaluated the helpfulness of receiving comments from peers against the insights one may reach while reading peer work. At the same time, students' preferences towards the double-blinded nature of the task were taken into account. Result analysis revealed two distinct attitudes, with participants that prefer double-blinded settings expressing a positive attitude and evaluating both roles as helpful (i.e., providing and receiving feedback) in improving one's work. On the contrary, participants that do not prefer double-blinded settings expressed a negative attitude, dismissing the helpfulness of both roles.

Keywords: Peer Feedback, Peer Review, Free-Selection, Student Perception.

1 Introduction

Peer feedback can be a powerful and versatile instructional tool, providing a range of learning benefits to both authors and reviewers. According to McConnell (2001), engaging students in peer review tasks offers the opportunity for a constructive and collaborative active learning exercise. From a pedagogical point of view, most current peer feedback settings are based on the socio-cultural theory of learning (Vygotsky, 1986; Falchikov, 2001; Liu and Tsai, 2005) according to which the peer dialog and the interaction between students are core mechanisms for creating knowledge. In practice, such dialog often occurs asynchronously, with peers interacting through their respective learning artifacts (i.e., author's initial work and reviewer's feedback comments). Studies on peer feedback have repeatedly associated the method with deeper knowledge acquisition (Papadopoulos, Lagkas, and Demetriadis, 2012b, 2017) and higher-level skills in the learning taxonomy, such as synthesis, analysis, and evaluation (Anderson and Krathwohl, 2001). At the same time, students' engagement in peer reviewing can support the development of their self-evaluation skills (Davies & Berrow, 1998), and improve their attitudes and self-efficacy (Anewalt, 2005).

The literature abounds with applications of the peer feedback approach in a plethora of different fields (for a review, see Papadopoulos, Lagkas, and Demetriadis, 2012b). Consequently, the applied methods vary significantly, with most promising cases engaging learners in multiple reviews. For example, Cho and Schunn (2007) reported that students that received feedback from multiple peers outperformed students that received feedback from a single expert. Several educational technology tools environments allow the learners to perform multiple reviews, with varied levels of freedom during the selection process (e.g., Denny, Luxton-Reilly, Hamer, & Purchase, 2008; Tsai & Liang, 2009; Tseng & Tsai, 2007; Cho & Schunn, 2007). Studies that allow reviewers to freely select which peer work to review have reported promising results. In such settings, highly engaged students tend to produce more reviews that are also of higher quality, while the less engaged students are still comparable to typical teacher-assigned review settings (Luxton-Reilly, 2009; Papadopoulos, Lagkas, and Demetriadis, 2017). Increasing the number of reviews a learner produces is important for free-selection settings, since, as several studies have reported, the peer review process may be more beneficial for the reviewer than the reviewee (Li, Liu, and Steckelberg, 2010; Lundstorm and Baker, 2009) – perhaps due to the fact that the task of analyzing and evaluating peer work is more cognitively demanding than integrating peer comments in revision. In addition, Ko and Rossen (2004) stated that while reviewing others, students receive perspectives other than the instructor's and this process could provide further insights.

Against this background, the current study aims to explore how learners perceive the helpfulness of peer feedback and the value of reading peer work in improving one's work, in a free-selection, double-blinded setting. Regarding the latter, hiding both author's and reviewer's identity is considered the golden rule in addressing biases and it is the standard approach in most empirical studies in Education (Goodwin, 2010). Nevertheless, the study looks closer on how personal preferences towards double-blinded settings may affect learners' attitudes. An added value of the study is that these research questions are investigated in the context of a PhD course. Therefore, the study sheds light on the impact of the method in the context of Doctoral Education.

2 Method

2.1 Participants

The participants of the study were enrolled in a teacher training course for PhD students titled Science Teaching that is offered every semester in the Faculty of Science and Technology. The 5 ECTS course combines face-to-face (4 full course days) and online sessions before and after each course day. The course is held in English, allowing international PhD students to attend. Although the participants are

PhD students with a strong academic profile, there is a difference in the subject fields, with participants coming from all departments across the Faculty of Science and Technology. Moreover, diversity in teaching experience is evident, as there are cases each semester with participants that may have no prior teaching experience.

The analysis presented in this study is based on the population of 58 course participants that completed all the phases of the peer feedback task that was an integral part of the course. The participants came from 14 different departments in the Faculty of Science and Technology and had participated in three prior course days.

2.2 The teacher training course

The purpose of the Science Teaching course is to support teaching assistants (TAs) in their teaching duties at the Faculty. The course focuses on active learning, classroom management, presentation skills, feedback, and on developing and implementing a small teaching activity in participants' own teaching.

One of the fundamental concepts of the course is constructive alignment (Biggs and Tang, 2011) that provides the framework for effective instructional designs in which meaningful learning outcomes are served by useful learning tasks and appropriate assessment methods. To engage participants with the concept of constructive alignment, the course asks participants to first identify a "problem", i.e., a teaching activity that they have to deal with in their field and for which they need support. The suggested problems have to be vetted by course instructors in terms of complexity and length. The teaching activity should consist of a small intervention that can easily be implemented in the course where the PhD students is functioning as teaching assistant. They can also focus on a subject or a method. Examples of appropriate teaching activities in the course are: "A case of enzyme cross-linking laboratory exercise", "Types and sources of air pollution", "Assembling a lab protocol", "Searching and referencing scientific papers", etc.

Next, the participants have to apply methods discussed in the course, design their teaching activities, and present them using a poster template. Table 1 shows the course calendar for the poster assignment.

Activity	**Calendar week**
A. Short description of teaching activity	Week 41
B. Online feed-forward from course instructors	Week 42
C. Implement the teaching activity	Weeks 43 – 45
D. Draft poster	Week 46
E. Peer feedback on poster	Week 47
F. Final version of poster	Week 48
G. Presentation of poster in class	Week 49

Table 1. Course activities during the academic calendar.

As mentioned earlier, the majority of participants have already started teaching in the university, before they take the course. This provides them the opportunity to implement the teaching activity they designed (Table 1, Activity C) in their actual courses and get some feedback from their students that they can include in the draft version of their posters. The outline of the poster template the students receive is presented in Table 2.

Step	**Description**
1. Identifying a problem	Argue about the problem you have focused on. Remember that the focus is on challenges related to students' learning, when explaining your "problem".

2. Planning a teaching activity	Based on the arguments in (1) then argue about how your teaching activity will "solve" or minimize the problem. What is the learning goal for your teaching activity?
3. Trying it out in practice	Describe the teaching activity and how the teaching was performed. Include examples or summaries of "data", e.g., pictures, quiz results or evaluations. How did you assess your learning goal and did the students learn what you intended?
4. Looking forward	Reflect on what worked well and argue about what would be a reasonable next step based on your experience so far. Here you can improve the reflection by discussing it with your peers.

Table 2. Poster template outline.

2.3 The peer feedback process

After preparing their draft posters, the participants have to submit a blinded version of the draft poster for the double-blinded peer feedback activity that follows (Table 1, Activity E). The students use a Google Form, providing their personal information (name, email, and department), the title of their poster, and the link to the poster file they have prepared. Regarding the latter, students are allowed to use any file sharing service they want (e.g., Google Drive, Dropbox, OneDrive, etc.), taking, of course, into account the requirement for a double-blinded review.

Once all participants have submitted their work, a list with all poster titles and respective links becomes available. The participants then have to review at least two peer works. The first peer work is assigned randomly and is the one that happens to appear below theirs in the list, while the participants are free to select the second peer work from the list according to their personal preferences. All posters are available for downloading by everyone and the participants can read several posters before they decide which one(s) to review. We encourage participants to review more than two, if they have the time, to provide more opportunities to their peers to improve their work and also to get a better idea of what the others are doing. We stress the importance of the latter by suggesting to the participants that by reading posters from peers, participants could find ways to improve their own work.

To help participants in providing useful feedback, we provide a set of optional review guidelines (Table 3), following the poster template structure.

Because of the high number of participants in the study, we split the list of 58 poster into three lists randomly, thus dividing the cohort into smaller groups and following the same process for all of them. The reason for that was twofold. First, studies on free-selection peer review protocols suggest that a long list could make the student select peer work randomly, while it is more likely that the student will read and select what to review more methodically, if the list is shorter and the number of available peer work manageable (Papadopoulos, Lagkas, and Demetriadis, 2012a). Second, we were able to group participants from related departments and provide them the opportunity to read posters that would be closer to their context.

The participants used another Google Form to submit their comments blindly to the poster authors, by selecting the poster titles they reviewed. Once we received all reviews, we used autoCrat, a document merging Google Sheet add-on that was able to merge the appropriate fields of the review form into PDF files that were automatically emailed to the authors, keeping the identities of all participants visible only to course instructors.

Once receiving peer feedback, the poster authors were free to decide which peer suggestions to incorporate in the final poster versions they submitted to the course instructors to complete the course. Next, participants filled in an online questionnaire regarding the review process and their preferences on author/reviewer identity. Finally, the participants presented their final posters in the class.

Review steps	Description
Identifying a problem/purpose	i. Is the problem/purpose clearly formulated? ii. Does the explanation of the problem take student learning into account?
Planning a teaching activity	i. Is one or more learning outcomes for the teaching activity presented? Is the learning outcome communicated appropriately, according to what you have learned in this course? ii. Does the teaching activity address the problem/purpose identified?
Trying it out in practice (if applicable)	i. Is there a description of the teaching activity and how the teaching was performed? ii. Are examples or data presented - e.g. pictures, results, evaluations? iii. Is there a description of how the learning outcome(s) was assessed?
Looking forward (if applicable)	i. Is there a reflection on what worked and what did not (did the activity work as intended)? ii. Is there a description of reasonable next steps?
General guidelines	
Your feedback must consist of 1. A very short summary of the presented poster (5 lines of text) – what is it about? 2. At least two things that worked well in the poster. Focus on some of the questions above. 3. At least two things that can be improved in the poster. Focus on some of the questions above.	

Table 3. Course activities during the academic calendar.

2.4 Data analysis

Participant responses in the activity questionnaire were the depended variables of the study, while their preference towards the double-blinded setting was used as the independent variable. For all statistical analyses, a level of confidence at 0.05 was used. Due to violation of the criterion of normal distribution, non-parametric statistical tests were used in our analysis.

3 Results

Table 4 presents the participants' responses in the activity questionnaire, organized according to their preference towards the double-blinded nature of the peer review process. Results showed that 35 out of the 58 participants prefer double-blinded settings in which the identities of both authors and reviewers are not disclosed. On the other hand, 23 participants prefer other settings. In the open text section of the questionnaire, the participants were able to further elaborate their answers or provide comments and suggestions for the course. Out of the 23 participants that do not prefer double-blinded settings, five mentioned a preference to completely open settings (all identities are visible), another five suggested a single-blinded setting (only authors' identity visible), and 13 did not provide any other comment.

The combination of one assigned and one freely selected review resulted in 19 posters receiving only one review, two posters receiving six reviews, and the remaining 90 reviews were submitted to the remaining 37 posters. Consequently, five students commented that they would have liked to receive more reviews, while eight students said that they liked the opportunity to select which peer work to review.

		Double-blinded Preference					
		No (n = 23)		Yes (n =35)		Total (n = 58)	
		M	SD	M	SD	M	SD
Q1*	How many posters did you read during the peer feedback activity? (scale: 2-19)	2.61	(1.03)	3.86	(2.96)	3.36	(2.43)
Q2	How many posters did you review? (scale: 2-19)	2.00	(0.30)	2.11	(0.47)	2.07	(0.41)
Q3*	Was the process (instructions, links, forms) easy to follow? (scale: 1:No – 5:Yes)	2.96	(1.33)	3.94	(0.96)	3.55	(1.21)
Q4*	How helpful were the peer comments you received for you? (Either in improving your poster or getting reassurance that you do not need to improve it.) (scale: 1: Not helpful – 5:Very helpful)	2.35	(1.07)	3.34	(1.08)	2.95	(1.17)
Q5*	How helpful was reading others' posters for you? (Either in getting ideas for improving your own poster or getting reassurance that you do not need to improve it.) (scale: 1: Not helpful – 5:Very helpful)	2.83	(1.23)	3.51	(1.04)	3.24	(1.15)
Q6+	How much time did you need, approximately, to review one poster (in minutes)?	23.13	(13.64)	17.83	(10.28)	19.93	(11.80)

* $p < 0.05$; + $p < 0.1$

Table 4. Participant responses in the activity questionnaire.

Participants read on average 3.36 posters (min = 2, max = 18) (Q1), with 22 participants reading at least four. The three most engaged readers read 18, 10, and 6 posters, respectively. However, only three participants were able to provide feedback to more than two posters (i.e., 4, 4, 3) (Q2), while several participants cited the limited amount of time they had available in their working schedule as the main reason for not engaging more in the activity, even though the whole process seemed easy to the majority of them (Q3). Regarding the helpfulness of the direct (peer comments) (Q4) or indirect (reading posters) feedback (Q5) the participants received in the activity, responses seemed to diverge, with the population split on the subject. Finally, the common poster template used and the structured review form allowed participants to complete each review in approximately 20 minutes (Q6).

Mann-Whitney U test results showed significant differences in the way the two participating subgroups (i.e., double-blinded/not double-blinded process) experienced the activity. Students that expressed a preference towards the double-blinded nature of the process had a more positive attitude by reading significantly more posters (Q1: $U = 537.500$, $p = 0.022$), and stating that the process was significantly easier for them (Q3: $U = 575.000$, $p = 0.005$). In addition, these participants also evaluated significantly more positively the helpfulness of peer comments (Q4: $U = 594.500$, $p = 0.002$) and of reading peer posters (Q5: $U = 540.000$, $p = 0.022$) in improving their own posters. Finally, the same participants tended to need less time to complete the review of a poster (Q6: $U = 302.000$, $p = 0.097$).

Furthermore, Wilcoxon Signed Rank test results showed that the participants that did not prefer the double-blinded process tended to evaluate the helpfulness of reading others' posters more positively than getting comments from peers ($U = 78.500$, $p = 0.086$), while the same tendency was not evident in the other subgroup that evaluated both feedback sources as equally positive. Moreover, Spearman's rho test results revealed a significant positive correlation between the number of posters read and the reported helpfulness of reading posters ($\rho = 0.347$, $p = 0.041$) for the participants that prefer the double-blinded process, while a similar correlation was not discovered for the other participants.

4 Discussion

Analysis showed that the preference towards the double-blinded nature of the peer feedback task had a significant impact on different aspects of the activity. Participants that prefer double-blinded settings expressed a more positive attitude and appreciated the feedback they received through the process at a higher level. On the contrary, participants that stated that they prefer other types of peer feedback settings revealed a negative attitude in all items of the questionnaire. Even though knowing or hiding the identities of the people involved in a peer review setting can largely define the experience of a learner, it was surprising to record such differences in the two subgroups of this study. The reason why such findings were not expected – at least at this level – was that the participants of the study comprised a group of learners that differed significantly from the audiences that are typically involved in studies around Education and Pedagogy, in terms of academic profile, metacognition, and prior experience with peer feedback tasks. First, all participants were currently in the process of obtaining a doctoral degree. Second, being active learners and responsible for creating new knowledge as members of academia should have provided them with more opportunities than other learners to increase their metacognitive level. Third, since the double-blinded review process is the norm in most academic publications, our assumption is that the participants were also familiar with similar settings, having played the roles of authors and potentially reviewers for scientific journals and conferences.

The main, and arguably strongest, argument in favor of hiding the identities of authors/reviewers in a peer feedback process is to avoid biases against the authors and support freedom of expression for the reviewers. An open setting would be more appropriate in cases where a direct dialogue between authors and reviewers is possible and where knowing the other person's identity would provide a better context of their work, allowing also for several feedback cycles to be completed. Nevertheless, this was not our case, since the poster assignment was carried out mostly online and participants had already voiced concerns regarding time constraints that prevented them in engaging deeper in the course. Therefore, even though we are not arguing against the double-blinded approach the findings of the study showed that an alternative setting should be considered for participants that have a strong opinion against it. We can only hypothesize on the reasons why this subgroup of participants had a negative experience in the task. First, it is possible that despite their familiarity with the double-blinded process, they were still not appreciative of its benefits, in general. Second, the fact that they appreciated the process of reading posters more than receiving peer comments may suggest an overall skepticism to accept comments from colleagues that were experts in their respective fields, but not in Pedagogy or Instructional Design. Despite the repeatedly validated value of peer feedback, a student may still look for the assurance that the expert feedback provides. In other words, not knowing who provided the review comments may have led this subgroup of participants to dismiss the received feedback more easily.

Finally, the free-selection setting of the process allowed several students to read more peer work than they would in a pre-assigned setting. Even though this did not increase the amount of reviews produced, it is still a favorable finding for the free-selection setting. The combination of assigned and freely selected reviews was a middle-ground solution that ensured that all participants would receive at least one review, while offering the opportunity to participants to read and review more, if they wanted.

5 Conclusions

This study provided empirical evidence showing that knowing the identity of authors/reviewers in a peer feedback setting can have a significant impact on learners' experience. The added value of the work is that contrary to the audiences employed in similar studies, the current study investigated the impact of author/reviewer identity by engaging a group of early career academics (i.e., doctoral candidates) in a peer review process. Analysis showed that personal preferences towards the double-blinded process were indicative of the way participants experienced the learning task.

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