

# EFFECTS OF ONLINE PEER REVIEW PRACTICE ON STUDENTS' RECEPTIVITY TO FEEDBACK

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## ABSTRACT

Engaging learners in cognitive activities of solving complex, open-ended problems, promoting high-level constructivist learning in large and online classes is essential for transforming education to satisfy the needs of the modern post-industrial information society. Online peer review and assessment (OPRA) systems became a popular tool for engaging students in these practices. Understanding the role of peer feedback and students' perceptions of feedback has become very important. This ongoing empirical study evaluates the effects of engaging students in OPRA activities on their feedback orientation, a construct describing an individual's overall receptivity to feedback.

**Keywords:** social learning, peer assessment, peer review, feedback orientation, self-efficacy

## INTRODUCTION AND RELATED RESEARCH

Since the 1970s, educational peer and self-assessment practices have been widely used by practitioners in various educational settings and intensively studied by researchers [4] [22]. Peer and self-assessment have been shown to promote high-level constructivist learning by engaging learners in cognitive activities of solving complex, open-ended problems and reviewing solutions [11] [19]. Multiple studies have demonstrated learning benefits of these practices in a variety of disciplines, such as business [9], accounting [16], engineering [14] [17], and social science [2] [11]. Specific benefits include better understanding of assessment criteria, providing timely and varied feedback, reducing instructors' overload, promoting active learning, developing transferable skills, and cultivating life-long learners [1] [6]. Some studies explored *student* perceptions of peer feedback utility [5] [24], while others looked at *instructors'* perspective [1]. A number of studies focused specifically on contrasting the benefits of *giving* and *receiving* peer feedback [15] [28]. Very few studies, however, focused on effects of peer and self-assessment on students' general receptivity to feedback.

Since 2000, educational online peer review and assessment (OPRA) systems made reliable assessment and development of higher-level competencies in large and online classes effective and scalable [8] [10] [18] [21] [23] [25]. OPRA allowed quantifying and understanding interactions among learners [26], providing timely and targeted feedback [22], and creating sustainable environments for self-regulating and self-curating learning. Thus, students become motivated to produce high-quality solutions and to provide extensive, professional, and developmental feedback to each other [7]. OPRA makes social learning through peer review and self-reflection not only more efficient (i.e., simpler, faster, and cheaper), but also more effective (i.e., enabling social learning peer interactions that were not possible with the "old-school" face-to-face, paper-and-pencil assessment techniques) [20]. Now, understanding students' receptivity to feedback in the context of online peer learning technologies is very important [27].

The purpose of this paper is to present the ongoing empirical investigation of the effects of engaging students in online peer review and assessment activities on their feedback receptivity, a construct called feedback orientation [13]. Adequate feedback orientation, i.e., willing to provide and use effective performance feedback, is essential for creating and sustaining vibrant learning and work environments. To benefit from social learning, students are expected to develop both abilities to provide effective feedback and to respond to peer feedback. We aim to answer the following research question: *Does participation in online peer review and self-assessment affect learners' feedback orientation?* We hypothesize that participating in OPRA activities has a positive effect on learners' feedback orientation, specifically improving self-efficacy of giving and receiving feedback. Since it is important to understand individual differences in feedback orientation among learners, the unit of analysis of this study is an individual student.

## **METHODOLOGY**

### **Participants**

The experiment is being conducted in a US east-coast medium-size public university. It involves approximately 120 undergraduate students (Computer Information Systems majors or minors) taking the same junior/senior-level course in Enterprise Architecture.

### **Experimental Design**

The classic controlled experiment design (the quasi-randomized control-group pre-post-test design) is used to test the hypothesis. Two sections of the course serve as the treatment group (approximately 60 students), and two other sections are the control group (approximately 60 students). Although randomized control-group design (i.e., where participants are assignment to control and treatment groups randomly) would be preferable, the allocation of students to sections and the use of an OPRA system by the treatment group places a constraint – the system must be used by all students in the same section. Therefore, the equivalence of the initial average feedback orientation in the control and treatment groups will be tested.

Participants in both groups complete a series of complex, open-ended assignments developing visual models of enterprise information systems architecture. For the treatment group only, participants are required to provide anonymous peer review and self-assessment according to the following protocol:

- Task 1. *Submission*: complete the assignment and turn in a report as a pdf document;
- Task 2. *Review*: provide critiques to and assessment of four peers' Submissions, as well as self-critique and self-assessment of one's own Submission, based on the holistic rubric;
- Task 3. *Reaction*: provide holistic assessment of received peer critiques, as well as self-assessment of one's own critiques given to peers;
- Task 4. *Results*: consider aggregated received peer assessment of one's own Submission and own critiques.

Participants in the treatment group turn in their submissions using an OPRA system called Mobius SLIP ([mobiusSLIP.com](http://mobiusSLIP.com)). In contrast, participants in the control group complete their assignments (Submission) on paper and do not engage in peer and self-assessment. Participants in both groups receive instructor feedback, but only the treatment group receives both instructor and peer feedback.

## Measurements

A modified version of the instrument developed and validated by [12] will be used to measure individual feedback orientation (see appendix). The instrument measures four constructs related to feedback – *utility*, *accountability*, *social awareness*, and *self-efficacy*. “*Utility* is defined as an individual’s tendency to believe that feedback is useful in achieving goals or obtaining desired outcomes” [12, p. 5]. “*Accountability* refers to an individual’s tendency to feel a sense of obligation to react to and follow up on feedback” [12, p. 6]. “*Social awareness* refers to an individual’s tendency to use feedback so as to be aware of others’ views of oneself and to be sensitive to these views” [12, p. 6]. “*Feedback self-efficacy* refers to an individual’s perceived competence to interpret and respond to feedback appropriately” [12, p. 7].

Modifications were made to the original instrument to accommodate the following objectives:

1. to adapt instrument items to the university context;
2. to measure respective attitudes towards giving and receiving feedback;
3. to measure respective attitudes towards receiving feedback from instructor and peers.

Participants in both control and treatment groups are being administered the survey instrument at the beginning of the semester (pre-treatment) and at the end of the semester (post-treatment).

## Statistical Analysis

Reliability and factor analyses will be conducted to validate the instrument. Then factorial ANOVA will be used to test our hypothesis.

## EXPECTED RESULTS AND FUTURE DIRECTIONS

Preliminary results of this study are expected to be available for presentation at the Western DSI Conference. We expect to demonstrate the positive effect of student engagement in online peer review and assessment on the four dimensions of feedback orientation. The findings of this study will inform the use of OPRA systems in university curriculum to build dynamic and engaging social learning environments.

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## APPENDIX

### Feedback Orientation Instrument

Do you agree with the following statements?

(On the 5-point scale from “strongly disagree” to “strongly agree”)

(Items are shuffled in the actual instrument).

#### Utility

1. Feedback contributes to my success at school.
2. To develop my skills in classes, I rely on feedback.
3. Feedback is critical for improving performance.
4. Feedback from professors can help me advance my education.
5. Feedback from my classmates can help me advance my education.
6. I find that receiving feedback is critical for reaching my goals.
7. I find that giving feedback to others is critical for reaching my goals.

#### Accountability

8. It is my responsibility to apply feedback to improve my performance.
9. I hold myself accountable to respond to feedback appropriately.
10. I don't feel a sense of closure until I respond to feedback.
11. If my instructor gives me feedback, it is my responsibility to respond to it.
12. If my classmates give me feedback, it is my responsibility to respond to it.
13. I feel obligated to make changes based on feedback from my instructor.
14. I feel obligated to make changes based on feedback from my classmates.

#### Social Awareness

15. I try to be aware of what other people think of me.
16. Using feedback, I am more aware of what people think of me.
17. Feedback helps me manage the impression I make on others.
18. Feedback lets me know how I am perceived by others.
19. I rely on feedback to help me make a good impression.

#### Self-efficacy

20. I feel self-assured when dealing with feedback.
21. Compared to others, I am more competent at handling feedback.
22. I believe that I have the ability to deal effectively with feedback I receive.
23. I believe that I have the ability to provide competent feedback to others.
24. I feel confident when responding to positive feedback.
25. I feel confident when responding to negative feedback.
26. I know that I can handle the feedback that I receive.