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Investigating Peer Review as an Intentional Learning Strategy to Foster Collaborative Knowledge-Building in Students of Instructional Design

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Peer review has been advocated for as an intentional strategy to support the knowledge and skill attainment of adult learners preparing for professional practice, including those students preparing for instructional design and technology practice. The purposes of this article are to discuss the practical application of peer review as an instructional strategy by articulating its use in both face-to-face and online Instructional Design courses and to formulate directions for future research on the use of peer review in instructional practice. Findings from a literature review of student-to-student peer review and the authors' experiences with the use of peer review in Instructional Design courses are used to foster a discussion that interweaves both important scholarly and practical elements.

Citing Mills and Cottell (1998), Bangert (2001) observed that several professional organizations, including those affiliated with such diverse professions as accounting and teaching, endorse "instructional strategies, that promote active learning, complex problem solving, experiential approaches, group work, and innovative uses of technology" (p. 77). Current national standards for educational technology demonstrate that these aims are relevant for students of instructional design and technology. Specifically, the National Educational Technology Standards and Performance Indicators for Students (ISTE, 2007) promote communication and collaboration, critical thinking, problem solving, decision-making, and digital citizenship, the last of which includes a positive attitude toward using technology that supports collaboration.

One instructional strategy in alignment with such professional standards is student-to-student peer review of course-related work. For the purposes of this discussion peer review refers to "the structuring of a process to allow peers to review each other's professional processes and/or products with the goal of improving such processes or products" (Woolf & Quinn, 2001, p. 22). Peer review is a learning strategy situated at the highest level of Bloom's taxonomy of learning in the cognitive domain (Bloom, Krathwohl, & Masia, 1956). Therefore, it is an attractive goal for educators, particularly those facilitating the learning of adults preparing for professional careers requiring the analytic and evaluative skills associated with problem-solving, and certainly in fields such as teaching and instructional design and technology. Peer review is well aligned with the concept of formative evaluation (Dick, Carey, & Carey, 2009) and, therefore, fits especially well within the context of an Instructional Design (ID) course, where formative evaluation is an important concept and skill for students to master. Incorporating peer review of course-related project work in an Instructional Design course reinforces the accreditation standards developed by the Association for Educational Communications and Technology (AECT, 2001) and the National Council for Accreditation of Teacher Education concerning formative evaluation. Peer review supports the concept of practice and its ongoing development as taking place within a situated and authentic context that supports a community of shared goals, artifacts, and interactions (Brown, Collins, & Duguid, 1989; Wenger, 1998), as well as the constructivist notion of shared knowledge-building through experience (von Glasersfeld, 1995). Peer review as an instructional strategy also aligns with the priorities identified by research on professional groups, group work, and group learning by fostering interpersonal skills in the marketing classroom (Chapman & van Auken, 2001) as well as shared creativity and reflection in the geographical information systems classroom (Livingstone & Lynch, 2000). In fact, peer scaffolding is identified not only as a viable alternative to instructor-scaffolded activities (Lai & Law, 2006), but also as a vital element to the collaborative group learning experience (Dalgarno, 2001; Towns, Kreke, & Fields, 2000).

The purposes of this article are to discuss the practical application of peer review as an instructional strategy in both face-to-face and online Instructional Design courses, and to formulate directions for research on the use of peer review. Findings from a literature review of student-to-student peer review and the authors' experiences with the use of peer review in Instructional Design courses will be used to initiate and foster the discussion.

Conceptual Context

A review of the literature on peer review as an instructional strategy offers the following insights. First, findings reveal that peer review benefits students by helping them to: identify good practice and be more

critical (Davies, 2000; Harris, 2006), strengthen self-regulation behaviors in order to provide constructive feedback on peer assignments (Ku & Lohr, 2003), Ozogul, Olina, & Sullivan, 2008), develop critical thinking skills (Li & Steckelberg, 2004), articulate design decisions in a professional context (Casey, Branvold, & Cargille, 1996), and comprehend the problem-solving and formative nature of professional practice, including instructional design practice (Woolf & Quinn, 2001). Second, peer review benefits instructors in that it may reduce the time required to evaluate complex assignments (Bangert, 2001; Ozogul, et al., 2008), thus potentially providing more time to offer higher level consultative guidance. Third, best practices in peer review suggest that instructors should provide clear criteria for peer feedback to avoid superficial feedback (Ku & Lohr, 2003), train students on evaluation processes (Ozogul & Sullivan, 2009), and use blind review to reduce bias (Li & Steckelberg, 2004; Ozogul, et al., 2008). Fourth, challenges to peer review include: fostering a work context that feels safe and familiar enough for peers to become and remain engaged in productive ways and providing enough guidance and structure for peers to maintain their focus on desired processes and outputs (Woolf & Quinn, 2001).

The next section will provide two examples from the current practice of two IDT instructors at different higher education institutions. The first example details the use of peer review in a face-to-face instructional design course. The second scenario describes its use in an online instructional design course. Although the professional context for each course is the same, peer review, as reflected in the literature review of its benefits, is relevant to other professional disciplines requiring group problem solving. In fact, Topping (1998) analyzed the use of peer assessment in group work across such varied disciplines as math modeling, business administration, speech communications, psychology, microclimatology, and engineering design. Further, in their meta-analysis of peer assessment in higher education, Falchikov and Goldfinch (2000) found that "peer assessment can be successful in any discipline area and at any level" (p. 317).

Peer Review in a Face-to-Face Instructional Design Course

The first author has been using peer review in an instructional design and other IDT and teacher education courses since 2002. Over that time, the peer review strategy has evolved in scope, structure, and depth based on student responses to the process, literature findings, as well as instructor reflections on practice. This section will describe the nature of peer review as of the Fall 2009 instructional design course experience at a large research university in the southeastern United States.

The Principles of Instructional Design course is a required course for all Instructional Design and Technology (IDT) majors. Residential masters and doctoral students complete this foundational ID course face-to-face in the fall of their first year in the program. The course enrollment averages fifteen students, many of whom are international students, most of whom do not have formal instructional design training or experience, and a few of whom come from other disciplines such as educational psychology, engineering education, and agricultural education. The course meets face-to-face for three hours per week for fifteen weeks.

Students are introduced to the concept of peer review as a practical means for engaging in instructional design work during the second class meeting. The instructor discusses the concept, presents a generic process for completing peer review, and solicits input on common "rules of engagement" when it comes to providing feedback. After reading about and discussing instructional goals, they complete a brief in-class assignment during which each student drafts an instructional goal related to an identified ID project and provides it to a fellow student for review. Each student provides written feedback according to the criteria given for sound instructional goals and debriefs his/her partner that same night in class.

This first peer review assignment is meant to be simple, structured, and monitored by the instructor in order for students to experience low-threat practice with peer review as well as have an opportunity to get to know one another better. Students are debriefed about the peer review experience and reminded that they will use peer review in varied forms throughout the rest of the semester. Students are somewhat shy about providing feedback to one another during this first peer review assignment. The assignment's simplicity, structure, and rules of engagement appear to ease this anxiety. The face-to-face setting is advantageous in that the instructor can closely monitor students' reactions and experiences, providing guidance and encouragement as needed.

By week three, students are grouped into teams of three to four and assigned one real-world instructional design project to work on for the rest of the semester. The goal for each team is to develop an instructional unit that meets the identified needs of the project. Each week, students work through an iterative process whereby they read about a new ID core concept, e.g. learner analysis, content analysis, etc., outside of class and receive instruction on that concept in class to draw out critical elements, explore examples, and practice application of the concept. Then, in their teams, they draft the relevant portion of the instructional design for their team project, submitting it for peer review by

members of another team the following week during class. The structure of these weekly formative reviews is less formal, although concept-relevant rubrics are provided as an additional means of support for knowledge and skill development. The challenge for the instructor is to encourage students to refer back to their support materials in conducting these reviews, as well as to mitigate any conflicts that may arise. Students respond positively to these reviews, noting that they often benefit from perspectives outside of the team as well as see things in the work of other teams that they can bring back to their teams to improve the work to-date.

A final, more formal and extensive, graded peer review occurs over weeks 12 and 13 of the semester. By this time, each project team has a complete draft of their instructional unit that has been subject to the weekly formative evaluations. At week 12, the team submits one full copy of their unit, via a project web site, to three to four individual peer reviewers chosen by the instructor. Each peer reviewer is provided with instructions and rubrics for completing the review and has one week's time to complete the review outside of class and provide electronic copy back to the authoring team and the instructor. By this time, students are comfortable with one another, with peer review, and with the nature of the projects. They comment regularly that this more extensive peer review is one of the most valuable assignments in the course, forcing them to re-engage with core principles and concepts explored during the semester at a deeper level in order to provide useful ID feedback to another team on a project that they understand themselves has become "near and dear" to the team. During the week 13 class period, the instructor debriefs students on their experiences with this assignment, asking them to reflect on what the authoring team members gained from the review in terms of improving their instructional designs and what the peer reviewers gained in terms of ID knowledge and skill development.

The intent going forward is to continue peer review in this course and conduct research to investigate the role of peer review in a face-to-face instructional design course. Anticipated outcomes of the research include reporting impact on student learning and providing guidelines for the effective application of peer review in the development of instructional design and other professionals-in-training who must engage in group problem construction, collaboration, and resolution as part of professional practice.

Peer Review in an Online Instructional Design Course

The second author used a structured peer reviewing process for an assignment in his two sections of an online Instructional Design course during the fall of 2009. The class is part of an online M.Ed. program in Instructional Technology offered through a regional comprehensive university in the southeastern United States. The students were enrolled in a course titled Instructional Design. Each section had an enrollment of 25 students, and the students were distributed widely across a large state in the southeastern United States. Most of the students were practicing K-12 educators. The course was offered in a completely asynchronous format.

As part of the class, a learner analysis paper was assigned during the fourth week of the 15-week semester. Students in the course were required to complete a detailed learner analysis and were provided with assignment details and the scoring rubric. The students were given 13 days to complete the assignment. Part of the assignment included participation in a blind peer review process, which consisted of two steps, prior to submitting the paper to the instructor for evaluation. Individuals posted their learner analysis papers (step 1) and provided feedback to one other student's posting (step 2).

Eight days were scheduled for the students to write their papers and post them for review. The students posted their papers to an anonymous discussion forum in the course management system. Students were asked to include a pseudonym in the subject line of their posting, and to communicate the pseudonym to the instructor using email. Two days were allotted for the review element of the peer review process. Students were instructed to select one paper to read and on which to provide feedback in the discussion forum. The identity of the reviewers was not available to the students receiving feedback. The instructor suggested that the scoring rubric for the assignment be used to structure the feedback. Additionally, students were directed to be "critical and constructive, but polite."

At the conclusion of the peer reviewing experience, students were instructed to revise their papers based on the peer reviewer feedback and to include a section at the end of the paper explaining the changes initiated by the peer reviewing process. Three days were scheduled after the review period for revisions and final submission of the assignment.

The practice described here is part of an emerging research program aimed at investigating the use of peer review in online Instructional Design courses. The general focus of the research program is to develop a set of empirically grounded best practices for using peer review in online instructional design courses. Feedback from this pilot project indicates that students appreciated the process and the opportunity to learn from their classmates using peer review. The instructor was not overburdened with logistical or technical matters facilitating the process. A next step is to study

whether or not the peer reviewing process improves the quality of the work submitted by the students.

Concluding Remarks and Directions for Research

Peer review as an instructional strategy for developing instructional design and technology professionals has the potential not only to support professional standards but also to address ongoing concerns regarding the inadequate preparation of instructional design and technology professionals. Peer review can support the need for instructional design students to understand real-world instructional design practice as non-linear, complex, and demanding cross-functional collaborative problem-solving and management skills (Brill, Bishop, & Walker, 2006; Casey, et al., 1996; Woolf & Quinn, 2001). Similar concerns articulated by other disciplines can be addressed with peer review as well (Maleki, 2009; Queeney, 1996).

Our review of the literature draws out some important benefits of peer review as a promising higher education pedagogy, particularly for those adult students being mentored into a new profession that demands collaborative problem posing, reflection, and resolution. Peer review has been shown to promote the recognition of good practice as well as critical and constructive collaborative dialogue. The cases presented here suggest that peer review can been integrated into the higher education classroom effectively and can benefit from intentional literature-based strategies such as clear feedback criteria and blind review, but they only do so anecdotally. Thus, our next steps are to conduct empirical research in both face-to-face and online settings to investigate learning outcomes and instructional strategies. Our research plans respond to the advocacy of scholars and practitioners for more research and models to better understand peer review as an intentional learning strategy for adult learners (Casey, et al., 1996; Falchikov & Goldfinch, 2000; Woolf & Quinn, 2001). Ongoing scholarship among higher education professionals offers an important venue for dialogue about peer review as an opportunity for advancing instructional practice, research, and better professional preparation for real-world practice.

References

AECT. (2001). Association for Educational Communications and Technology Retrieved from http://www.aect.org/standards/initstand.html

Bangert, A. W. (2001). Peer assessment: A win-win instructional strategy for both students and teachers. *Journal of Cooperation & Collaboration in College Teaching, 10*(2), 77-84.

Bloom, B. S., Krathwohl, D. R., & Masia, B. B. (1956). *Taxonomy of educational objectives: The classification of educational goals*. New York, NY: D. McKay.

Brill, J. M., Bishop, M. J., & Walker, A. (2006). An investigation into the competencies required of an effective project manager: A web-based Delphi study. *Educational Technology Research and Development, 54*(2), 115-140.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32-42.

Casey, C., Branvold, D., & Cargille, B. (1996). A model for peer review in instructional design. *Performance Improvement Quarterly, 9*(3), 32-51.

Chapman, K. J., & van Auken, S. (2001). Creating positive group project experiences: An examination of the role of the instructor on students' perceptions of group projects. *Journal of Marketing Education, 22*(2), 117-127.

Dalgarno, B. (2001). Interpretations of constructivism and consequences for computer assisted learning. *British Journal of Educational Technology, 32*(2), 183-194.

Davies, P. (2000). Computerized peer assessment. *Innovations in Education and Training International. 37*(4), 346-355.

Dick, W., Carey, L., & Carey, J. O. (2009). *The systematic design of instruction* (7th ed.). Upper Saddle River, NJ: Pearson.

Falchikov, N., & Goldfinch, J. (2000). Student peer assessment in higher education: A meta-analysis comparing peer and teacher marks. *Review of Educational Research, 70*(3), 287-322.

Harris, M. J. (2006). Three steps to teaching abstract and critique writing. *International Journal of Teaching and Learning in Higher Education, 17*(2), 136-146.

ISTE (2007). National Educational Technology Standards and Performance Indicators for Students Retrieved September 18, 2009, from http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/NETS_for_Students_2007_Standards.pdf

Ku, H.-Y., & Lohr, L. L. (2003). A case study of Chinese students' attitudes toward their first online learning experience. *Educational Technology Research and Development, 51*(3), 95-102.

Lai, M., & Law, N. (2006). Peer scaffolding of knowledge building through collaborative groups with differential learning experiences. *Journal of Educational Computing Research, 35*(2), 123-144.

Li, L., & Steckelberg, A. L. (2004). Peer assessment support system (PASS). *TechTrends, 49*(4), 80-84.

Livingstone, D., & Lynch, K. (2000). Group project work and student-centered active learning: Two

different perspectives. *Studies in Higher Education, 25*(3), 325-345.

Maleki, R. A. (2009). Business and industry project-based capstone courses: Selecting projects and assessing learning outcomes. *Industry and Higher Education. 23*(2), 91-102.

Millis, B. J., & Cottell, P. G., Jr. (1998). *Cooperative learning for higher education faculty*. Phoenix, AZ: Orxy Press.

Ozogul, G., Olina, Z., & Sullivan, H. (2008). Teacher, self and peer evaluation of lesson plans written by preservice teachers. *Educational Technology Research and Development, 56*(2), 181-201.

Ozogul, G., & Sullivan, H. (2009). Student performance and attitudes under formative evaluation by teacher, self and peer evaluators. *Educational Technology Research and Development, 57*(3), 393-410.

Queeney, D. S. (1996). Redefining competency from a systems perspective for the 21st century. *Continuing Higher Education Review. 61,* 3-11.

Topping, K. (1998). Peer assessment between students in colleges and universities. *Review of Educational Research, 68*(3), 249-276.

Towns, M. H., Kreke, K., & Fields, A. (2000). An action research project: Students perspectives on small-group learning in chemistry. *Journal of Chemical Education, 77*(1), 111-117.

von Glasersfeld, E. (1995). *Radical constructivism: A way of knowing and learning*. Washington, DC: Falmer Press.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. New York, NY: Cambridge University Press.

Woolf, N. H., & Quinn, J. (2001). Evaluating peer review in an introductory instructional design course. *Performance Improvement Quarterly, 14*(3), 20-42.

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