Assessment Matters: Enriching Design Education
Through Online Peer Critique

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Abstract

The Internet has enabled us to expand how and where we learn, and in many cases, when. In an era where the classroom has aggrandized beyond four walls, implementing online assessment strategies has never been easier. Online technology has endorsed exciting shifts in pedagogical practice for design education, generating unique opportunities to connect students with one another to critique and assess the development of their work. This paper presents three ways in which the authors have implemented the use of online peer assessment to enrich their design courses and discusses how these activities enhance the learning experience.

Keywords: Assessment, assessment strategies, design education, online peer critique.

The role of online peer assessment in design education has become of particular interest in recent years as a strategy for enhancing the quality of the learning process, fostering the development of critical thinking, and increasing learner autonomy (Falchikov & Goldfinch, 2000). Peer assessment refers to a process during which students consider the quality of another's work or performance, judge the extent to which it reflects targeted goals or criteria, and make suggestions for revision (Topping, 2013). Peer assessment is characterized as task specific and is based on the quality of the peer's work rather than a student's abilities or personal qualities. The peers can be enrolled in the same or different course, of differing ability levels, and can be randomly assigned, instructor assigned, or self-chosen (Lui & Andrade, 2014).

In a design studio, students are thoughtful and insightful critics. They are familiar with the intricacies of assigned projects (having tried to work out their own solutions) and can contribute a variety of viewpoints to their peers' designs. For online assessment to be used effectively in a design studio, the methods of assessment must be structured and employed in a way that promotes design development, and bridges the gap from theory to practice. The advantages of providing online peer assessment are five-fold. First, several online interfaces support peer assessment activities that mimic social media and conveniently allow students to participate anonymously, thus increasing the willingness to engage. Second, online assessments that are comment-based provide a platform by which students can foster and exercise their use of design vocabulary. As students are chal-

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lenged to use vocabulary to critique their peers appropriately, they improve their communication skills thus narrowing the possibility of ambiguous interpretations in how they describe their own work. This builds student confidence. Third, online assessments can be networked to reach a broad audience of peers, yielding more diverse feedback and expanding student understanding for how the work responds to a variety of factors and constraints. This supports the development of their critical thinking skills and results in more meaningful design solutions. Fourth, online peer assessments can be structured to simulate professional-like discussions about projects. This fosters an academic design community that supports the transition from program to practice. Finally, online peer assessments provide design educators with the unique opportunity to archive and learn from student discussions, and to use the gained knowledge to improve the course.

Implementing Online Peer Assessment

The latitude by which we rely on the Internet has enabled us to expand how and where we learn, and in many cases, when. With robust online connections as convenient and accessible as our cell phones, the classroom has aggrandized beyond four walls. Designing online experiences as an instructor has never been easier, especially with the support of streamlined programs that package the technology into one platform. Moodle has proven to be a convenient and reliable hub in hosting a variety of outside online resources. Some of these include the Rogo e-assessment system to construct online testing, Xerte Online Toolkits to create online learning materials, Qualtrics to generate online surveys, and VoiceThread to facilitate online discussions. Moodle itself features a variety of built-in tools and activities that can be used to implement an online component for any University course; grade tools, forums, surveys, tools to collect and disseminate course content, test and quiz generators, and a variety of other features designed to customize the digital exchange of academic information.

Design lends itself as an underrepresented, yet fitting content area to explore these online resources, especially for the use of facilitating peer critique. Online platforms can be personalized to control how students connect to each other and their instructor. This flexibility makes it especially convenient to implement into a project-based course, where student learning is often determined by assessing subjective and perspicacious outcomes; the depth of the design process, the development of an idea, and the overall success and communication of a design solution.

Implementing effective peer assessment requires planning activities that benefit the learners. This involves matching the desired outcome with an appropriate evaluation method. As online methods vary in a number of ways, it is important to consider how students will provide feedback and to whom, how the activities will be managed and moderated, and how the data will be collected and used. Furthermore, online assessments often involve the coordination of anonymous peer groups, which require further consideration. Preserving anonymity to relieve social pressure is essential in maintaining the reliability of the peer assessment process. Zhao (1998) found that maintaining anonymity between the reviewer and the author encourages students to provide more suggestions and increases the usefulness and authenticity of their feedback.

Examples of Implementing Online Peer Assessment in Design Education

One of the activities that design instructors struggle with the most is getting students to provide thoughtful and detailed feedback of their fellow students' work. According to Brown (2014), the peer assessment process is challenging for students because:

- Many of them are new to the concepts, theories, and language of design, so they experience difficulty knowing what to say or how to say it.
- They don't want to hurt their peer's feelings, so they are weary of expressing dislike for another's design choices.
- They are terrified of what others may say about their work, so they refrain from saying anything about their peer's work.
- Some simply do not care or have an opinion.

To combat these barriers and to engage students in dynamic discussions about design, the authors have outlined three distinct online assessment strategies that enhance the learning experience for design students. While the primary goal of each strategy is to improve the quality of the assessment by requiring students to use specific guidelines, a secondary goal is to encourage knowledge acquisition during the process.

Anonymous Assessments: Peer Assessments Using an Online Survey

Online surveys are a convenient and straightforward strategy for conducting peer assessment. The surveys can be customized to meet the needs of any question type and can include a visual component. Using Moodle, the authors customized a survey for a second-year interior design studio featuring digital scans of each student's hand-renderings (see Figure 1).

The purpose of the survey was to solicit students to anonymously view the work of their peers, and provide feedback for improvement. The survey was constructed by uploading a chronological gallery of bi-weekly hand-renderings, visually depicting the growth of each student's progress. Through a series of questions, students were asked to select drawings from the sequence that best- demonstrated proficiency with a variety of competencies (i.e. line work, marker technique, etc.). A comment box allowed students to give feedback by writing suggestions for how to further develop the final hand-rendering. As an incentive to complete the survey, participating students were able to retrieve live survey results directly from the course Moodle site. It is interesting to note that while participation in the survey was voluntary with no grade attached, 70% of the students in the course took part.

As shown in Figure 1, participating students were able to convey successfully, in writing, their recommendations for improvement. Their comments were rich in design vocabulary, honest, and straightforward. Additionally, the activity revealed those students lacking design discourse and those struggling to apply appropriate terminology. The survey was surprisingly useful.

| Chair #1 | Chair #2 | Chair #3 | Chair #4 |
| Sept. 22 | Oct. 6 | Oct. 20 | Nov. 3 |
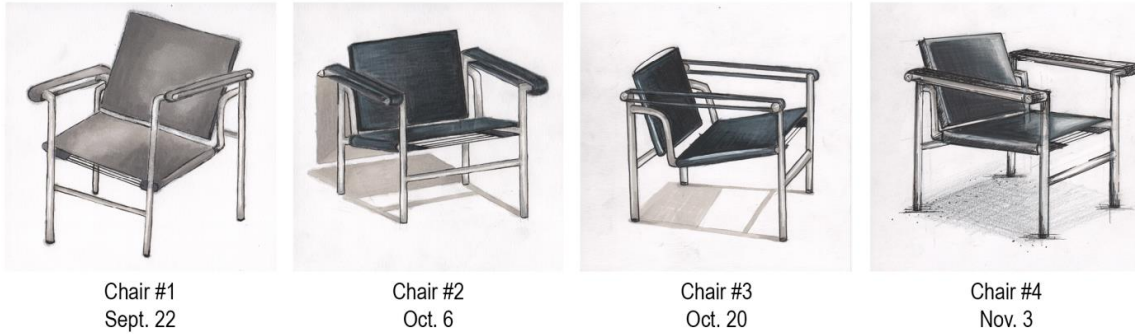
Responses	#1	#2	#3	#4
Which chair rendering is the MOST successful?	0%	0%	43%	57%
Which chair rendering is the LEAST successful?	93%	7%	0%	0%
Which chair shows the BEST angle / perspective to use for the final chair?	0%	0%	21%	79%
Which chair demonstrates the BEST line work (based on class discussions)	0%	0%	7%	93%
Which chair demonstrates the BEST marker rendering techniques?	0%	0%	21%	79%

Provide written comments to this student, including suggestions for how to improve the final chair #5.

Three and four are both great. Chair #4 looks looser with fuzzy lines, hit-go-hit and overlapping lines, and chair #3 looks more crisp and clean with more mechanical lines of even thickness.

You can really see how much you've improved in rendering technique, using Lin's principles in this sequence of drawings! The use of hit-go-hit, overlapping lines, thick and thin lines, dots, professional gaps where there is a lot of reflection, and repeating lines make chair #4 look the most real.

I really like the fourth attempt! It's very dynamic, showing a depth of value to express the materiality of the leather, nicely placed shade and shadow, and highlights to give the chrome a real metal look.

Chair #4 comes alive! Great work on the shadows using dots and stripes.

The proportions of your fourth chair are clearly well planned. The perspective angle of chair #3 is the best, showing how the chair form angles at the back of the seat. The line gaps, highlights, repeated lines, and value really makes the character of this chair pop! I like the punch line at the base of each leg.

The incorporation of professional gap and dot, shade and shadow, value, variable lines are very obvious in chair #4, and are very successful.

Nice blend of mechanical and freehand lines on the fourth rendering!

Pay attention to the size of the chair and the composition of the drawing layout for the final. Try to leave a more even amount of white space around the drawing.

Figure 1. Online Survey.

Students reported that they appreciated the anonymity of the survey and that the experience of assessing someone else's work crystallized their understanding of the grading criteria. They also enjoyed seeing the rendering techniques that other students used.

Evaluating peers' work exposed students to rendering solutions that they otherwise would likely not see. Overall, the authors feel that online surveys have proven to be an exciting method of peer evaluation that enhances design education.

### Casual Critiques: Peer Assessment Using A Discussion Space

In an era of social media, it is not hard to believe that social platforms have found a place in education. Forums, blogs, and course-devoted accounts with Facebook, YouTube, and Instagram have all become common practice. Such platforms promote a dynamic and frequent exchange of ideas, the very ingredients integral to effective design education. To explore the value of such platforms in the context of online peer assessments, the authors integrated VoiceThread into their first-year interior design studio.

VoiceThread is a moderately social and highly interactive program that features user-generated, multimedia slide shows that hold images, documents, and videos. To create a "thread," a user uploads the media and then invites thread participants to exchange comments. Comments are exchanged by typing text, or by recording voice or video messages. An additional tool available to those recording comments is Doodle. The Doodle tool allows a participant to draw directly on the uploaded images by using a mouse. The drawings are visible to anyone who has access to the thread. The threads can later be embedded as links in web sites and exported as digital movie files. With VoiceThread, group conversations can be collected and shared in one place from anywhere in the world. Participants need only an email account and the Internet to be involved. As an added convenience, the program is operable as a smartphone application.

The authors have found VoiceThread to be invaluable. Aside from single studio use, the authors have used VoiceThread as an assessment tool across multiple sections of an identical course. In critiquing the work of peers, the online technology has allowed students to create their own threads and upload images of their design work. Once uploaded, comments can be solicited and posted via text, audio, or video. Because comments become visible to all participants of a thread, additional features allow a thread's owner the ability to monitor and moderate the activity, allowing for comments to be rearranged, hidden, or removed (see Figure 2).

Design students have enjoyed the integration of VoiceThread and have adopted the program as a common method for exchanging feedback. Students find the online tool to be intuitive and relatively easy-to-manipulate. They mention that the program provides a fun way to discuss the opportunities and challenges of their work and that it is an efficient way of communicating with each other and their instructor. One student praised the activity by sharing, "This online program allows us to view work of other students across different sections and is allowing us to get feedback out of class without wasting valuable class time."

Both the students and the authors have found that using VoiceThread for online peer assessment enhances the design studio experience in three distinct ways. First, using this tool generates a unique extension of the traditional design studio and allows students an
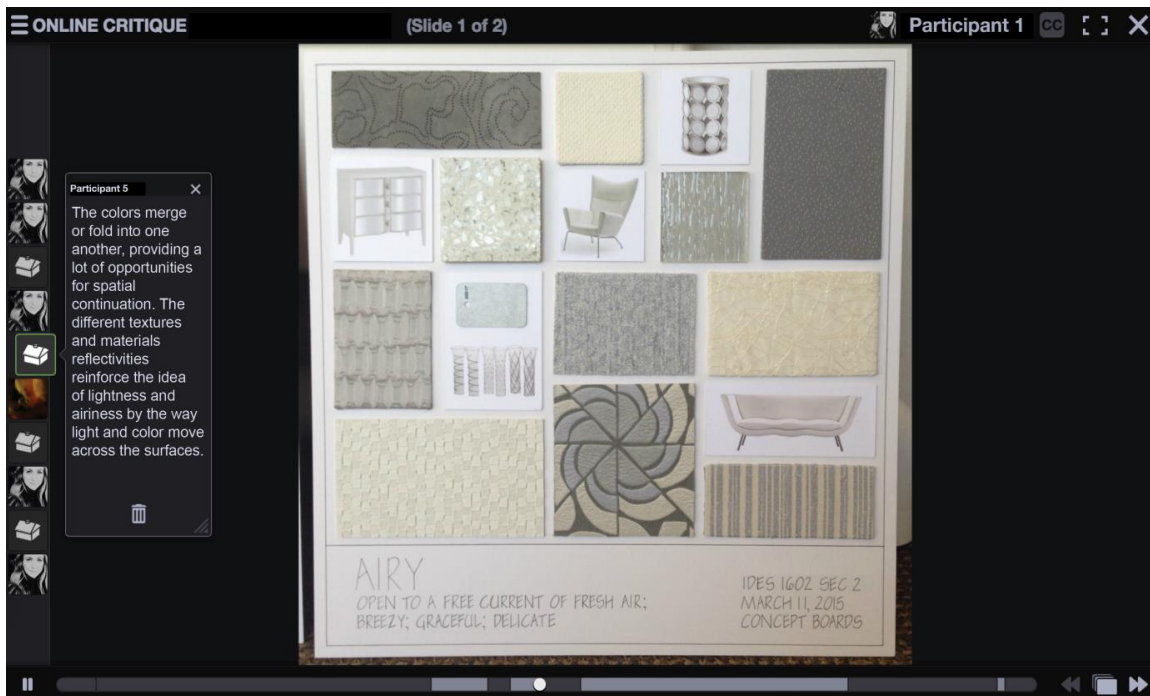
Figure 2. VoiceThread.

autonomous method to engage in reviewing each other's work, outside of class and on their own schedule. Second, VoiceThread allows students to exchange feedback without an expiration date. This presents a unique, longitudinal model of peer assessment, useful for documenting student development. Student thoughts, learning, and work are archived in a single thread and can be built upon over time, such that a comprehensive thread might contain a collection of work that chronicles the development of any particular skill. Lastly, as an assessment tool, VoiceThread effectively endorses collaboration and participation among students by providing a space to demonstrate the application of knowledge.

Guided Grading: Peer Assessment Using An Online Interactive Rubric

For large courses taught exclusively online, providing students with timely, accurate, and meaningful assessment of their work is often a challenge. Peer grading is a successful solution. In peer grading, assessors apply criteria for scoring and evaluating the work of their peers. In addition to reducing instructors' workloads, peer grading has been found to bring many benefits to student learning, including a sense of ownership and autonomy, increased motivation, and higher-order thinking skills (Luo, Robinson, & Park, 2014).

Therefore, for a large online creative problem-solving course, the authors used the Moodle workshop activity module to develop an interactive rubric. The rubric was designed for a creativity project that challenged students to design and develop experiences that involved "doing something different," tasking them to think divergently about various simple acts. The project required students to uniquely define a problem, engage others in

a public setting, and to design a novel experience. Students were urged to share the development of their ideas, planning, and research on the Moodle forum. The final phase of the project was submitted as either a video or digital presentation. Once the projects were uploaded into Moodle, they were anonymously randomized and allocated for peer review. Each student was assigned three projects to review and received participation points for completing the task. This accounted for a small portion of their project grade. After viewing each project, students were prompted to evaluate the work using the online rubric. The rubric was presented as an interactive chart with embedded buttons for scoring (Figure 3). As an additional measure for providing feedback and to allow students to justify their assessment, students also had the option of leaving written comments.

Figure 3. Online Interactive Rubric.

Students were highly engaged with this method of peer assessment. Engagement was best demonstrated by the use of the optional comment box (see Figure 3). Students provided a wide variety of thoughtful, reflective, and sometimes lengthy feedback. Students reported that although the peer grading was challenging and time-consuming it benefited them to think more critically.

Overall, the authors have found that the rubric was especially fitting for a visually rich project involving a diverse combination of video, imagery, and descriptive text. The workshop module allowed the presentation of any type of file and video link. The online tool helped to normalize the scoring by multiple reviewers. The quality of peer grading and the breadth and depth of the comments were extremely agreeable with the authors' assessment of the work. The results suggest that incorporating online interactive rubrics with commenting features is a smart strategy to engage students, increase class participation, and to teach more effectively.

Discussion

The experience of implementing these online methods of peer assessment revealed interesting parallels, as well as some unexpected challenges. All three methods resulted in a rich array of original, student-generated feedback; evidence that students are highly capable of reviewing the work of their peers, and that peer assessment is an engaging academic activity. These parallels suggest that design education is enhanced by using online technology as a means to involve students with the process of assessment. This is an exciting arena for instructors and researchers to explore.

While the authors noted parallels between each strategy, they also noted some collective challenges. In every instance, some students chose not to participate. This condition seemed immune to aspects of anonymity (as in the case of survey reviews), the use of a casual interface that mimics social media (VoiceThread critiques), and grade-based incentives (online rubric). The possibilities for why a student may or may not participate in online peer assessment is vast, but perhaps stresses the importance of providing a variety of activity types to respond to the diversity of student needs.

Overall, the authors have found that encouraging students to help each other develop their work not only builds collaboration skills and trust but also leads to deeper understanding and more thoughtful and reflective discussions. Empowering students in this way demonstrates that they can play an important role in the learning process and lends greater legitimacy to their opinion. Plus, when students share their knowledge with others, they educate themselves twice.

In closing, if design educators are to meet the needs of today's students, they must find ways to acknowledge the role of technology and to implement it as a way to engage them in the learning process. The online peer assessment strategies presented in this paper do that. These strategies are not isolated to design education. They are capable of enhancing any course that encompasses the development of ideas. We see this paper as a step in the process of re-framing what online peer assessment can be, and a proposal for how it can

be taught. With so much to be done and so many avenues to explore, the authors are eager to continue these dialogues.

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