AECT ASSOCIATION FOR EDUCATIONAL COMMUNICATIONS & TECHNOLOGY

ORIGINAL PAPER

CrossMark

The Perceived Value of Informal, Peer Critique in the Instructional Design Studio

Jason K. McDonald[1] (iD) · Peter J. Rich[1] · Nicholas B. Gubler[1]

Abstract

The purpose of this study is to investigate how instructional design students perceive the informal, peer critique as an influence in their studio education. Our participants were students enrolled in beginning and advanced studio courses in the department of Instructional Psychology and Technology at Brigham Young University. Groups of 2–3 beginning students were assigned a reviewer from the advanced course, who then led critiques over two face-to-face class sessions with their assigned groups. Students perceived the critique experience to be helpful, although beginning students perceived greater value than did the advanced (possibly due to the time advanced students took to build confidence in the beginners). Students also reported ways in which the critique experience could have been improved, with the most common suggestions being to hold critique sessions more frequently and for longer periods of time. We conclude by discussing the role of informal, peer critiques in the instructional design studio, including how they could complement other forms of feedback that students receive. We also discuss how our findings could contribute towards future research into the value of critique in the instructional design studio environment.

Keywords Studio critique · Informal critique · Peer critique · Instructional design · Studio pedagogy · Student learning

The purpose of design studio teaching is to enculturate students into the customs, habits, and skills of professional design practice. Nearly ubiquitous in fields like architecture and industrial design, the studio is a form of project-based learning, characterized by structures like having students work on projects similar to those completed by professionals; having instructors model design processes; and using in-depth critiques of student work as a primary means of instruction (Cennamo 2016; Schön 1985). As Brandt et al. (2013) concluded, the studio acts "as a bridge between academic and professional communities.. ... focused on preparing students to adopt the tools, practices, and beliefs" of their chosen profession (pp. 336–337). In other words, the studio serves as the

"kiln where future [professionals] are molded," (Salama and Wilkinson 2007, p. 5).

This socializing capacity is important because so many design skills are tacit, and difficult to explicitly teach. As Hoadley and Cox (2008) stated, "the paradox of teaching design is that designers know things, but they can't tell others about them in a way that novices will understand" (p. 19). This includes learning professional judgment, voice, artistry, and ability to speak professional languages of a discipline (Cennamo 2016; Schön 1985). It is in the interplay between modeling, discussion, practice, and feedback that students begin to experience what it means to be a designer, and start to develop competencies that are difficult to define but almost universally identified as attributes of the skilled professional (Brandt et al. 2013).

In recent years, the possibilities afforded by design studio teaching have gained wider attention in fields beyond those in which the approach was originally developed, including instructional design (Knowlton 2016). As Gibbons (2016) asserted, "in a changed professional world, studio training has become a new standard: one that supplies many of the intangible skills that [instructional designers] can no longer [take] for granted" (p. 137). But some of the same factors that attract instructional design educators to the studio may also

✉ Jason K. McDonald
jason@byu.edu

Peter J. Rich
peter_rich@byu.edu

Nicholas B. Gubler
nickngubler@gmail.com

[1] Brigham Young University, 150-E MCKB, Provo, UT 84602, USA

Springer

make it challenging for them to implement the approach. Existing norms in the field about how teaching or learning should take place may not be fully compatible with the culture encouraged by studio activities (Gray 2016).

One of the settings in which this is evident is the studio culture around the critique. Critiquing is the process of receiving feedback on a design-in-progress, from instructors, other students, or panels of outside experts. The form of critique can range from formal evaluation sessions (often referred to as juries), to informal discussions between studio participants that occur while working on assignments (Hokanson 2012). In many disciplines where studio has long been the tradition, critiquing (especially formal critiques) can be a difficult experience for students, as the feedback can be harsh and unsparing of their emotional well-being (Anthony 1991; Gray and Smith 2016). Yet, this is not a fit with education disciplines, as Cennamo (2014) observed when quoting one participant in a studio class, "in education, it's not that stressful. It's like we all want to be nice and collaborate and care about people's feelings" (p. 66). In fact, critiquing can have such a negative connotation that one of the more well-studied instructional design studios has intentionally avoided formal critiques because of concern about its effects on the culture that faculty want to encourage (Clinton and Rieber 2010).

The purpose of this study is to investigate how instructional design students perceive that the critique fits into their experience in the instructional design studio. We specifically examined informal critiques, often referred to as a "crit," consisting of discussions between studio participants where they share feedback on, and ideas about, others' work (Hokanson 2012, p. 75). In our case, these informal critiques took place between students from two instructional design studio courses in our graduate program. Studying informal, peer critiques provided an opportunity to learn about instructional design students' experience with this form of learning in a lower-stakes manner than might be the case if we introduced a jury or other, high-stakes form of feedback. The question we asked was, how do instructional design students perceive the informal, peer critique as an influence in their studio education?

Literature Review

Critiquing is "to analyze or assess something in a detailed way" (Thiessen 2017, p. 147). It plays such an important role in design that Gray (2013a) identified it as "the centre of design practice, both in the education of a designer and in formal design practice" (p. 110). While it seems an obvious purpose of critiquing is to improve the products of student work, scholarship on design education has identified other outcomes of the studio critique that have broader implications for the socialization and enculturation of design students.

These include gaining experience with decision-making (Huet et al. 2007), learning how to communicate (Dannels et al. 2008), and helping students "find their own voice as designers and to learn what is expected from them as members of a profession" (McDonnell 2016, p. 10).

It is often these broader outcomes that are studied in design scholarship, frequently focusing on how students perceive the critique as an influence in their education (Chiu 2010; Conanan and Pinkard 2001; Jurado 2011; Knowlton et al. 2016; Sawyer 2017; Schrand and Eliason 2012). This is likely due in part to the difficulty in isolating the effects of critique on an individual student's performance, given the highly-variable nature of how each student engages in the design process. But it is also due to the measure of success in a design studio including the "beliefs, values, or even enjoyment of design" that students are encouraged to develop, not only their ability to complete an individual assignment (Knowlton 2016, p. 353).

Although studio critiques are often performed by instructors or other experts, peer critique is also an important pedagogical method in design education (Hokanson 2012). Woolf and Quinn (2001) characterized peer critique as, "the structuring of a process to allow peers to review each other's professional processes and/or products with the goal of improving student processes or products" (p. 22). Peer critiques can happen both inside a studio course as well as outside the classroom structure (Gray 2013b). They are typically informal, having been described as "conversations" between students about their work-in-progress (Cennamo and Brandt 2012, p. 852). They also tend to be a fluid and natural part of the studio where ideas are shared rather than assessed (Budge et al. 2013). Peer critique is almost universally regarded by design students as an important component of their learning. This is possibly due to the "level of student engagement in peer reviews, level of student expertise, and level of trust and community among students" that frequently exist in design courses (Schrand and Eliason 2012, p. 58). This is the case even when peer reviewers are novices and their comments do not reflect the expert performance of the instructor (Oh et al. 2013; Zamberlan and Wilson 2017). In fact, Gray (2013b), quoting one studio participant, observed that it was often more valuable for peers to spend critiques "asking questions" about a project rather than "giving an opinion" about how an assignment measured against any formal standards (p. 202).

Scholarship has also observed similarities between peer critique in the design studio and other forms of peer learning found in education more broadly (Zamberlan and Wilson 2015, 2017). What is known about peer critique in other settings is that it offers benefits that traditional instructor-student interactions do not easily provide. Feedback from peers can provide students more frequent and more detailed opportunities for help (Topping 2009). Students also may be more likely to implement suggestions given by their peers (Jurado 2011;

Wood and Kurzel 2008). There are also social benefits to peer critique, as students learn to cooperate and work together as teams (Boud 2013; Rich et al. 2015). And Hattie (2008) concluded that peer critique also provides benefits for students actually performing a critique, helping them understand the subject more deeply and identify opportunities for improving their own skills.

Critiques are not a universal good in design education, however. Scholarship points to some disciplinary cultures of critique being overly harsh and even cruel, although this tends to be found in more formal forms of the activity such as summative jury reviews (Anthony 1991). Yet even peer critiques can come at some cost. If peers are perceived as competitors, interactions between students may be viewed as "stress-inducing," "a motivation for peers to 'steal' ideas from one another," or even leading to some students feeling "excluded or sidelined from the majority group" (Smith 2015, p. 86). Additionally, if students misunderstand the nature and purpose of the critique, the feedback they give can be superficial and not help their peers reflect or improve in meaningful ways (Thiessen 2017).

It is unknown whether these competitive tendencies between students exist in instructional design, but it appears to be unlikely. Two recent studies have investigated the role of peer critique in helping instructional designers build their knowledge and skill, both of which cast the approach in positive terms. Brill (2016) studied the technique in her instructional design course, concluding that students generally found critiques to be both helpful and supportive. And Clinton and Rieber (2010) mentioned student critique as a constructive component of their instructional design studio, although they do not describe it (or students perceptions of it) in detail.

Method

Our research employed a survey method, gathering both qualitative and quantitative data to understand the phenomenon of informal peer critique in one instructional design studio. Our goal was to better understand how students perceived peer critiques as an influence in their education, and develop descriptions of those perceptions that other studio educators may find insightful (Merriam and Tisdell 2016). This could include areas in which existing literature suggests we may find an influence (e.g., shaping students' design thinking and values as a professional, or providing them opportunities to engage in teamwork), but we also were open to peer critique having unexpected influences in our students' experience, and so included survey questions to solicit unforeseen results. Our intent was to explore peer critiques in a manner that would allow us to "understand how the actors, the people being studied, see things" (Stake 1995, p. 12). We recognize there are limitations survey data can provide in understanding these issues richly

and in a detailed manner. Our interest, however, was to begin inquiry into perceptions of critique and not to produce a definitive case study of the critique experience. We report findings using the actual words of our participants as much as possible.

Context

This study took place in the instructional design studio that has recently been established by the department of Instructional Psychology and Technology at Brigham Young University. Early efforts to develop our studio program can be found in Rich et al. (2015) and Gibbons (2016). At the time of this study two studio courses were a requirement for students specializing instructional design. The first was a beginning course that focused on basic skills of the instructional design process. Students worked individually to apply those skills in a project of their choice. The second was an advanced course where students worked as a team to solve a more difficult educational program for a client chosen by the instructor. These courses were integrated in the sense that those in the advanced class were required to assist beginning students with their initial design projects, while the beginning students performed a service assignment that would help the advanced students complete their course project. It is in the context of this integration that our study took place.

Participants

Our participants were students enrolled in the beginning and advanced instructional design studio courses described above. Because students in the advanced course typically have only two or three additional semesters of experience in the program than do those in the introductory course, it is important to note that throughout the paper our use of beginning and advanced only refers to students' status in the program. It is not necessarily commentary on their general skill level. We selected participants across two semesters. In the first semester, 12 beginning students and five advanced students enrolled. In the second, seven beginning and three advanced students enrolled. All students were included in our study, with the exception of one beginning student who opted out of the research. Our populations, then, were $N = 18$ (beginning) and $N = 8$ (advanced). Tables 1 and 2 provide additional information about students in the two classes.

Procedure

Our study took place in two class sessions a little more than half-way through each semester. Groups of 2–3 beginning students were assigned a reviewer from the advanced class. Note that while we define the activity under study as a critique, we use the term reviewer to refer to those offering these

Table 1 Characteristics of beginning students

Student characteristics	Count
Men	12
Women	6
Completing an instructional design PhD	1
Completing an instructional design MS	12
Completing another graduate degree	4
Completing an undergraduate degree	1
Prior instructional design experience	2
No prior instructional design experience	16
Professional experience (any field)	8
No professional experience	10
Total students (both semesters)	18

critiques. We do this to avoid negative connotations arising from the term critic, which would be more technically aligned but might misrepresent the nature of the activity that occurred. Each reviewer met face-to-face with his or her group over the course of about an hour in each of the two sessions. At the beginning of the first session, both the beginning and advanced students received brief instructions on participating in a critique. Advanced students then conducted their group as they thought would be most helpful for those with whom they were working. All reviewers asked questions about the projects and gave suggestions. Others expanded the experience by soliciting feedback from other students in the group, or by having students demonstrate a component of their project for the rest of the group.

In this study we did not provide students with a set of criteria to use during their critique sessions. Studio critiques in our program are more similar to the "conversations" described by Cennamo and Brandt (2012, p. 852), rather than evaluations or assessments (see also Shaffer 2003). We anticipate that additional research could explore how student perceptions of the studio critique are influenced in cases where specific evaluation criteria are included.

Table 2 Characteristics of advanced students

Student characteristics	Count
Men	5
Women	3
Completing an instructional design PhD	1
Completing an instructional design MS	7
Prior instructional design experience	8
No prior instructional design experience	0
Professional experience (any field)	4
No professional experience	4
Total students (both semesters)	8

Students in both classes completed a survey about their experiences in critique session. The survey consisted of a set of Likert-type questions for students to report their perceptions of the critique experience (see Tables 3 and 4), along with open-ended questions for students to provide comments on the process or outcomes of their critiques. Some questions for each class were parallel, meaning that we asked a similar question to both beginning and advanced students, allowing us to compare responses between groups.

Analysis

Our data analysis comprised two parts. We first calculated descriptive statistics for the Likert-type questions, both to judge student perception of the value they gained from the overall critique experience, as well as to compare perceptions between beginning and advanced students. Second, we coded the open-ended responses to summarize major themes evident within each response. In our findings, we first report the general outcomes of student critiques based on the statistics, followed by codes/themes that emerged from our further analysis.

The coding process consisted of three steps. Initial coding was based on significant keywords or phrases included in survey responses and was completed by two members of the research team, independent of each other. For codes that had an implied measure of value (e.g., "perception of student skills"), the initial code was also appended with a keyword representing the value being expressed (such as "positive" or "negative"). Second, the independent coding schemes were reconciled by the full research team into one set of codes. Third, the final set of codes were compared and contrasted, to find relationships between codes that indicated they could be merged or placed into a more inclusive category.

Trustworthiness

In this study, we used triangulation, negative case analysis, peer examination, and member checking to help establish the trustworthiness of our findings (Lincoln and Guba 1985; Merriam and Tisdell 2016). Triangulation took place through the gathering of both qualitative and quantitative data. In our discussion below, we draw attention to when the two types of data either converge to similar conclusions or where they reveal tensions between each other. Negative case analysis is the process of examining findings for examples that provide counter-evidence to conclusions being drawn. Researchers then consider how those negative cases should modify the confidence with which conclusions are presented or the conclusions themselves. Our negative cases are particularly discussed in a section on improving the critique experience. Peer examination took place both as the independent coding between members of the research team was discussed and

Table 3 Beginning students' perceptions of peer critique experiences

Question	Mean (1 = not at all; 5 = extremely)
How knowledgeable about instructional design was your reviewer?	4.2
How clearly did your reviewer explain concepts related to instructional design?	4.1
How well did your reviewer show concern for your learning?	4.4
How well did your reviewer answer questions about instructional design?	4.1
How helpful was it to your learning instructional design to receive feedback from someone other than your instructor?	4.2
How helpful was it to hear from your reviewer about his or her personal experiences?	3.9
How well did your reviewer help relieve anxiety about your ability to be successful in this course?	3.1
Before working with your reviewer, how confident were you that you had the knowledge and skills to be successful in this course?	3.6
To what extent did working with your reviewer give you new ideas about instructional design?	3.6
Did your reviewer clarify any concepts that were confusing when explained by your instructor?	27.8% Yes
	38.9% No
	33.3% Not Sure
Do you feel more prepared to be successful in this course because of working with your reviewer?	77.8% Yes
	22.2% Not sure

reconciled, as well as through discussion of this study with other researchers and educators. Finally, a member check was conducted with the study participants. Every participant who responded to the survey was emailed an initial draft of the article that highlighted all student comments as well as any themes under which we categorized the comments. The email also requested students to report instances they thought we were misrepresenting their intent in how we presented our findings. The feedback we received was incorporated into the final version.

Table 4 Advanced students' perceptions of peer critique experiences

Question	Mean (1 = not at all; 5 = extremely)
How prepared were you to review for beginning students?	3.4
How clearly did you explain concepts related to instructional design?	3.1
How concerned were you that your beginning student(s) learned the concepts of instructional design?	3.5
How well did you answer your beginning student(s) questions about instructional design?	2.5
How well did you help relieve your beginning student(s) anxiety about his or her ability to be successful in this course?	2.4
Before being a reviewer, how confident were you that you had the knowledge and skills to be successful as an instructional designer?	3.3
To what extent did being a reviewer give you new ideas about instructional design?	3.6
To what extent did being a reviewer clarify concepts or ideas about instructional design about which you were previously not clear?	3.1
Did you clarify any concepts that had confused beginning student(s) based on the original instructor's explanation?	12.5% Yes
	12.5% No
	75% Not Sure
Do you feel more prepared to be successful as an instructional designer because of your experience being a reviewer?	62.5% Yes
	12.5% No
	25% Not sure

Findings

While many students reported positive perceptions about the role of critique in their instructional design studio experience, the results were not the same for the beginning and advanced classes. In this section we review these findings, first from the beginning course, then the advanced, and finally comparing parallel measures between beginning and advanced students.

Results for Beginning Students

Beginning students generally perceived the critique experience to be helpful (see Table 3). Their greatest perceived benefit was the concern reviewers showed for their learning (M = 4.4 on a 5-point scale). Other highly reported perceptions were the value of receiving feedback from people other than their instructor, and how knowledgeable they thought their reviewers were about instructional design (both questions M = 4.2). Even the lowest reported parameter—how well reviewers relieved beginners' anxiety about being successful in the course—was reported slightly better than neutral (M = 3.1).

New Perspectives Beginning students reported that much of the value they gained from the critique experience came as reviewers offered them new perspectives on their projects. While only one student reported actually learning a new concept in a critique session, over 2/3 reported their reviewer helped them think about instructional design concepts in new ways, as illustrated by the following two statements:

- "It was very helpful because it was another perspective from outside the class;"
- "It was helpful just to get additional ideas and think about things from another perspective."

Individual Attention Beginning students also reported that reviewers gave them more individual and personalized attention than they could receive from the class instructor. One reason simply had to do with the time available in class. As one student commented, "it is easier to [critique] one on one and make sure information is covered and understood than it is to instruct an entire class and attempt to make sure of the same things." Additionally, some students mentioned that reviewers gave them perspectives they did not believe were available from their instructor, "my [reviewer] has a technical background, so I talked a little more about how I hope the technology will work in the end."

Similar Status Another recurring theme in beginning students' comments was how much they enjoyed working with reviewers who were in a similar situation to themselves. One

student reported, "it was also helpful that he was more my age and [instructional design] level, so I could see the realistic progress that could be made within a semester." Similarly, other students described the confidence they gained by observing students similar to themselves, "my [reviewer] survived this class and is [in] the more advanced class, so it must be possible!"

New Ideas Finally, after the critique sessions, over 80% of the beginning students had specific ideas of how they would work differently both on their class projects and in the future as both students and instructional designers. Often, their comments suggested a desire to seek more clarity or focus early on. Over half made a comment like, "I will focus more on defining and accomplishing end objectives." And beyond the parameters of the class, many reported they learned the value of seeking out critique of their work, "I've made personal goals to seek out more advice from [reviewers] and content experts regarding my project." Or, as another student stated, "I will make sure at the start of each semester to find a graduate student to bribe with food to critique all the things I do."

Results for Advanced Students

Advanced students' perceptions were mixed, with them reporting more value in the experience for themselves than in the value they thought they provided to beginners (see Table 4). The highest-rated perception among advanced students was whether being a reviewer gave them new ideas about instructional design (M = 3.6), and whether they felt more prepared to be successful as an instructional designer because of their experience as a reviewer (62.5% reporting Yes). Prior to this experience, only three reviewers (37.5%) were "very" or "extremely" confident that they had the skills and knowledge to be a successful instructional designer. Following the experience, the majority (62.5%) indicated that the process of acting as a reviewer helped them to feel more prepared to be instructional designers.

Advanced students also initially reported doubt about their capability to offer valuable feedback, or to speak authoritatively about instructional design. The most negative survey results related to advanced students believing they had adequately answered beginners' questions (M = 2.5), and whether they had relieved beginners' anxieties (M = 2.4). But after completing the experience, at least some came to believe they had more capabilities than they initially thought. As one student stated, "I wasn't sure that I would be that helpful, but now I feel that I was able to help. I felt that my experience had prepared me to think critically and to ask questions that help define a project and move it forward." The notion that they were more prepared to "think critically" was echoed by other advanced students who felt this project prepared them to be better instructional designers.

Several students also indicated that critiquing allowed them to see how their early program or professional experiences helped inform their current instructional design practices. One student stated, "it's more that I can see my preparation rather than necessarily being more prepared (though actually participating as a [reviewer] prepared me to [critique] in the future)." Another said, "looking at another project objectively helped me realize that I'm more prepared than I originally thought." Or, as one student admitted, "I am not quite as ignorant of [instructional design] principles as I thought." Some advanced students further explained how they would practice instructional design differently as a result of this experience. Most indicated that they would "seek feedback more hungrily." In some cases, this meant getting the "client's ideas and info more prior to jumping in with answers/recommendations."

Comparing Beginner and Advanced Responses

On parallel measures, beginning students rated advanced students higher than advanced students rated themselves. Because our sample sizes were small and we cannot assume our populations were normally distributed, we compared them using the Wilcoxon signed-rank test (see Table 5). All four comparisons suggest that beginning students more positive perceptions about the influence of advanced students is statistically significant when compared to the advanced students' perceptions of themselves.

Students' open-ended responses may provide some insight to why beginners perceived the advanced students more positively. Beginning students felt those providing critiques were empathetic, listened well, and helped beginners feel empowered. In fact, only three responses to the question about what reviewers did well focused on their instructional design knowledge or skill. Representative comments include

- "She made me feel capable;"
- "His disposition made it easy to work with him;"
- "He listened well and communicated a real sense of engagement and investment in the project."

Advanced students provided similar comments when asked what they thought they did well. One advanced student said, "I listened, took notes, asked questions, responded thoughtfully." Another's response was similar, "I showed concern by listening. I was concerned about helping with their projects." Emphasizing the affective dimension, another student responded that he or she, "told them their projects were awesome, sounded fun, and could be extremely useful. [I encouraged] smiling/laughing together."

Student Ideas for Improvement

Throughout their comments students also reported ways in which the critique experience could have been improved. Suggestions to improve critiques fell into two categories, preparation and frequency.

Preparation Advanced students explained that they could have benefited from more guidance in how to conduct a critique session. When asked how prepared they felt to offer critiques, most (75%) indicated that they were only "somewhat" ready for the experience. One student suggested that the advanced course instructor could have spent some time modeling critiquing activities, namely, demonstrating how to ask questions, offer feedback, and structure a critique discussion. The advanced students also pointed out that the beginners also could have been better prepared by their instructor for the experience. One reviewer noted:

> "The students we were supposed to [review] didn't always have questions or desire for feedback. They wanted to tell us about their ideas, but didn't have any questions afterwards. I think the expectations . . . should be more clear."

Finally, advanced students believed they could have been more prepared had they been familiar with beginners' projects before the critique sessions began. Because reviewers were unfamiliar with projects prior to the critique sessions, they had to spend some of their consultation time simply understanding the background on the beginners' work. Reviewers

Table 5 Comparison of beginning and advanced students on parallel questions (using the Wilcoxon signed rank test)

Question	Beginning student mean (1 = not at all; 5 = extremely)	Advanced student mean (1 = not at all; 5 = extremely)	p-value
Clearly explain concepts?	4.1	3.1	.001
Show concern?	4.4	3.5	.001
Answer questions?	4.1	2.5	.001
Relieve anxiety?	3.1	2.4	.0003

indicated that reading project summaries ahead of time would have helped them make better use of their critique sessions.

Frequency The most common feedback on how to improve critiques was how often students should work together. Both beginning and advanced students offered ideas for restructuring the critique process for greater frequency, most often suggesting that the experience could be improved if reviewers were involved in the project end-to-end. One student even recommended that it might be helpful to create critique groups as part of a project's initiation, and giving students the option to collaborate any time throughout the semester:

> I think it could be improved by having the [reviewers] more involved earlier in the semester. Perhaps we could have been paired up with certain students towards the beginning of the semester. Then if they had questions, we could have been another person to contact about concepts they were confused on, like an informal TA. From my experience, we came in too late in the semester to do more than offer feedback on what they're doing rather than act as a model.

Discussion

The Value of Informal, Peer Critiques

The positive tenor of our findings suggests that informal, peer critique can be a helpful component of the instructional design studio and should be considered by instructors in addition to other forms of teaching and assessment. We base this claim on two of our findings: first, the confidence students gained through the critiquing process; and second, how students' perceptions of the critique process reinforced design skills they had previously learned.

Student Confidence Many responses from both beginning and advanced students reflected a growing sense of confidence in themselves and their instructional design skills after participating in the critiques. The enthusiasm and interest advanced students showed helped build confidence in the beginners, which was at least as important (if not more so) than the actual substance of feedback that was given. It may be that beginning students experienced a halo effect, with their positive emotions influencing their impressions of advanced students' skills and leading them to judge the overall experience more positively. But, the effect was not isolated to beginners. Even the advanced students felt more confidence in their instructional design abilities after providing critiques, even though they questioned how helpful those critiques actually were.

Although we can imagine situations where untrained reviewers, even empathetic ones, could offer damaging critiques, we cannot discount the positive impact on our students' self-perception after their experience, even given the highly informal character of their discussions.

We contrast our findings slightly with Brill (2016), who concluded that it is valuable to include rubrics or other evaluative standards when implementing feedback techniques similar to peer critique. While some of this difference may be due to Brill focusing more on critiques as a form of knowledge building and we highlight their effect on students' confidence, we also emphasize that choosing more or less scaffolding is not an either-or decision. Just as multiple forms of critique are found in studios from other design disciplines (Dannels and Martin 2008), the same could (and likely should) be true in instructional design studios as well. The contrasting nature of our findings and Brill's suggests there is a place for both formality and informality, more structure and less, at different points throughout a studio course as means of providing students richer and more meaningful learning experiences.

Skill Reinforcement Our findings also indicate that positive student perceptions of the critique acted as reinforcement for design skills they had learned earlier in the course. The clearest example of this may be comments from students that reflected a sense of surprise about the usefulness of the critiques, as if they did not know that receiving outside input and feedback was actually helpful in the design process. As we considered these comments we realized that nearly all of our beginning students were new instructional designers working on their first substantive project. Even though they had been introduced in class to the practice of seeking out feedback on their work (and even completed a small assignment doing so earlier in the semester), these critique sessions were likely the first time that some of them took the process seriously. While they had learned the theory of critiques, not until they experienced them in-class had they seen the value of them in practice. It may be, then, that part of the value in informal and peer critiques could be to help persuade students that developing good design habits will be for their long-term benefit.

Improving the Critique Experience

While students offered suggestions for improving the critique experience, we see some tensions in our data regarding their ideas, meaning they could lead to benefits as well as unanticipated consequences. As noted, advanced students reported they would like to be more familiar with beginners' projects before critique sessions began, and students in both groups reported interest in participating in critique more often. However, giving advanced students time to review projects beforehand could also lead to them asking fewer questions during the critique itself, which the beginners felt was one of

the greatest strengths of the experience (i.e., that advanced students listened and asked questions).

The same could be the case regarding suggestions to implement more frequent peer critiques. Many of the beginners' comments highlighted the value of hearing new perspectives on their work, while also recognizing that over the long-term it was their responsibility to seek out needed critiques. Yet, we can imagine scenarios where providing more critique opportunities might lead to beginners' not developing a sense of autonomy regarding their own work, possibly even to the extent of their design process being co-opted by those providing the feedback. This may manifest as a strong-willed reviewer pressuring a less-experienced student into doing the project the reviewer wants, rather than one that is an expression of the beginner's own design character. Thus, involving reviewers more frequently throughout the process must also be balanced with careful monitoring to ensure responsibility and autonomy remains with the students completing the project.

We highlight these possible tensions in our findings as a reminder that the spirit of critique is one of flexibility and responsiveness to both immediate and long-term student needs (see Dannels 2005). And, as Wilson (2013) reminded, "the coherence and elegance of [a learning environment] does not reflect theoretical purity or consistency of origins, but rather how elements hang together and support a coherent experience for learners" (p. 40). No one form of critique will serve all needs equally well, and instructional design educators will need to be creative in adopting/implementing critique forms to help them tailor the approach for maximum student benefit.

Future Research Possibilities

We also surmise, based on our findings, that since informal peer critiques were perceived by instructional design students as a positive influence, it may be possible to shape other forms of critique in the instructional design studio so they also lead to positive effects. There has been concern among instructional design educators that formal forms of critiques such as juries may damage the supportive culture they hope to build in their studios (Clinton and Rieber 2010), and those implementing student evaluation through juries have reported that the process of doing so can be far from smooth (Knowlton et al. 2016). Yet, we speculate that it may be too early to give up these approaches completely. If our findings are reflective of the culture of instructional design more broadly, it appears that the instructional design studio is likely more similar to the supportive atmosphere found in some collaborative fields (Cennamo 2014) than to the competitive atmosphere found in others (Smith 2015).

Consequently, if formal forms of critique, such as juries, could be shaped in the instructional design studio so as to foster the same encouraging attitude as was demonstrated by our advanced students, those being critiqued would benefit from the higher levels of expertise that would be available from faculty, professional designers, or other evaluators. We recognize this may not be an easy task, as the history of juries demonstrates the difficulty of implementing them well (Anthony 1991). Yet, this is not universally the case, as they appear to be more effective in some design disciplines than they are in others (see Cennamo and Brandt 2012). Despite their drawbacks, even some critics of the jury have concluded that they should be reformed and not abandoned, recognizing that in theory they could play an important role in student learning and identity formation (Webster 2006). When we consider these observations along with our findings, we have hope that instructional design educators, with their understanding of the learning process and how to shape learning environments, may be in a strong position to innovate forms of jury critique that capitalize on their potential.

Limitations

There are several limitations in this study of which readers should be aware. First, the study was conducted with students from a single university, in a specific configuration of the design studio approach. Students from different university cultures or cultures of studio teaching may not experience the same outcomes as did our students. Additionally, only two critique sessions were conducted each semester. It is possible that student responses could have provided richer data if they participated in more critiques. Another limitation is that the number of students (especially advanced students) participating in the study was small. Although this is typical for educational research, we acknowledge there may have been more variability in responses had more students enrolled in our classes. Finally, the design of the study relied on survey data rather than forms of data collection that could provide more detailed descriptions of student perceptions, such as interviews. Our interest, however, was to begin inquiry into the issues surrounding student perceptions of critique in the instructional design studio, and not to produce a definitive case study. Future research can address these limitations through richer and more detailed forms of data collection.

Conclusion

Our purpose has been to explore how instructional design students perceive the informal, peer critique as an influence in their studio education. We conclude that it is perceived as a positive influence, especially as students were able to develop more confidence in themselves and receive reinforcement on skills they learned earlier in the course. Students also reported ways in which the critique experience could have been

improved. They suggested the critique process be restructured for greater frequency, both to spend more time critiquing projects and scheduling more critique sessions throughout the semester. While these suggestions may not be wholly without consequence, it appears that they do have merit and should be considered by instructional design educators.

Our findings have implications both for instructional design studio practice as well as for future research into the studio critique. First, we infer from our findings that there is a place in the studio for informal critiques of the type we studied, in addition to more formal critique structures that have been suggested by other researchers. The studio is a complex system with multiple purposes and desirable outcomes that may be different across disciplines and even across instructors (Brandt et al. 2013). Our study has led us to conclude that many forms of critique (formal and informal, more structured and less) are valuable for instructors to consider as they attempt to reach their desired ends, whatever those ends may be. Second, our findings point to the value of further studying how the critique is perceived by students in the instructional design studio, including the formal jury process that is often viewed negatively in other fields. We speculate our findings could serve to inform how jury or other studio critiques could be structured so that instructional design students experience them as a positive influence on their education.

Finally, we encourage both scholars and practitioners to continue inquiry into how the studio is influenced by, as well as is an influence on, the culture of instructional design education more broadly. Our research has strengthened our belief that the studio has valuable affordances for a variety of desirable ends that are important in the education and socialization of novice instructional designers. We hope this study contributes to readers' interest in exploring the role the studio environment could have for their own students or others whom they influence.

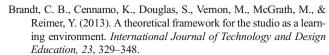## Compliance with Ethical Standards

Conflict of Interest   Jason K. McDonald is employed by Brigham Young University, the university under study.

Peter J. Rich is employed by Brigham Young University, the university under study.

Nicholas B. Gubler is a student at Brigham Young University, the university under study.

References

Anthony, K. H. (1991). *Design juries on trial: The renaissance of the design studio*. New York: Van Nostrand Reinhold.

Boud, D. (2013). Introduction: Making the move to peer learning. In D. Boud, R. Cohen, & J. Sampson (Eds.), *Peer learning in higher education: Learning from and with each other* (pp. 1–17). New York: Routledge.

Brandt, C. B., Cennamo, K., Douglas, S., Vernon, M., McGrath, M., & Reimer, Y. (2013). A theoretical framework for the studio as a learning environment. *International Journal of Technology and Design Education, 23*, 329–348.

Brill, J. M. (2016). Investigating peer review as a systemic pedagogy for developing the design knowledge, skills, and dispositions of novice instructional design students. *Educational Technology Research and Development, 64*(4), 681–705. https://doi.org/10.1007/s11423-015-9421-6.

Budge, K., Beale, C., & Lynas, E. (2013). A chaotic intervention: creativity and peer learning in design education. *International Journal of Art & Design Education, 32*(2), 146–156.

Cennamo, K. (2014). In education we all want to be nice: Lessons learned from a multidisciplinary design studio. In B. Hokanson & A. S. Gibbons (Eds.), *Design in educational technology: Design thinking, design process, and the design studio* (pp. 57–73). New York: Springer.

Cennamo, K. (2016). What is studio? In E. Boling, R. A. Schwier, C. M. Gray, K. M. Smith, & K. Campbell (Eds.), *Studio teaching in higher education: Selected design cases* (pp. 248–259). New York: Routledge.

Cennamo, K., & Brandt, C. (2012). The "right kind of telling": knowledge building in the academic design studio. *Educational Technology Research and Development, 60*(5), 839–858.

Chiu, S.-H. (2010). Students' knowledge sources and knowledge sharing in the design studio—an exploratory study. *International Journal of Technology and Design Education, 2*, 27–42. https://doi.org/10.1007/s10798-008-9061-9.

Clinton, G., & Rieber, L. P. (2010). The studio experience at the University of Georgia: an example of constructionist learning for adults. *Educational Technology Research and Development, 58*(6), 755–780.

Conanan, D. M., & Pinkard, N. (2001). *Students' perceptions of giving and receiving design critiques in an online learning environment.* Paper presented at the European conference on computer-supported collaborative learning (EURO-CSCL).

Dannels, D. P. (2005). Performing tribal rituals: a genre analysis of "crits" in design studios. *Communication Education, 54*(2), 136–160. https://doi.org/10.1080/03634520500213165.

Dannels, D. P., & Martin, K. N. (2008). Critiquing critiques: a genre analysis of feedback across novice to expert design studios. *Journal of Business and Technical Communication, 22*(2), 135–159. https://doi.org/10.1177/1050651907311923.

Dannels, D. P., Gaffney, A. H., & Martin, K. N. (2008). Beyond content, deeper than delivery: what critique feedback reveals about communication expectations in design education. *International Journal for the Scholarship of Teaching and Learning, 2*(2), 1–16. https://doi.org/10.20429/ijsotl.2008.020212.

Gibbons, A. S. (2016). Evolving into studio. In E. Boling, R. A. Schwier, C. M. Gray, K. M. Smith, & K. Campbell (Eds.), *Studio teaching in higher education: Selected design cases* (pp. 137–151). New York: Routledge.

Gray, C. M. (2013a). *Discursive structures of informal critique in an HCI design studio.* Paper presented at the Nordes 2013: Experiments in Design Research, Copenhagen, Denmark/Malmö, Sweden, Copenhagen, Denmark.

Gray, C. M. (2013b). Informal peer critique and the negotiation of *habitus* in a design studio. *Art, Design & Communication in Higher Education, 22*(2), 195–209. https://doi.org/10.1386/adch.12.2.195_1.

Gray, C. M. (2016). Emergent views of studio. In E. Boling, R. A. Schwier, C. M. Gray, K. M. Smith, & K. Campbell (Eds.), *Studio teaching in higher education: Selected design cases* (pp. 271–281). New York: Routledge.

Gray, C. M., & Smith, K. M. (2016). Critical views of studio. In E. Boling, R. A. Schwier, C. M. Gray, K. M. Smith, & K. Campbell

(Eds.), *Studio teaching in higher education: Selected design cases* (pp. 260–270). New York: Routledge.

Hattie, J. (2008). *Visible learning*. Thousand Oaks: SAGE Publications.

Hoadley, C. M., & Cox, C. (2008). What is design knowledge and how do we teach it? In C. DiGiano, S. V. Goldman, & M. Choroset (Eds.), *Educating learning technology designers: Guiding and inspiring creators of innovative educational tools* (pp. 19–35). New York: Routledge.

Hokanson, B. (2012). The design critique as a model for distributed learning. In L. Moller & J. Huett (Eds.), *The next generation of distance education: Unconstrained learning* (pp. 71–83). New York: Springer-Verlag.

Huet, G., Culley, S. J., McMahon, C. A., & Fortin, C. (2007). Making sense of engineering design review activities. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing, 21*(3), 243–266. https://doi.org/10.1017/S0890060407000261.

Jurado, J. A. (2011). Group projects in interiior design studio classes: peer feedback benefits. *Journal of Family and Consumer Sciences, 103*(1), 34–39.

Knowlton, D. S. (2016). Design studios in instructional design and technology: what are the possibilities? *TechTrends, 60*(4), 350–358.

Knowlton, D. S., Johnson, L., Thomeczek, M., Liu, Y., & Liumsden, J. N. (2016). Juries as innovation in an instructional design and technology program: a saga of continuous improvement efforts. *International Journal of Designs for Learning, 7*(3), 1–18.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.

McDonnell, J. (2016). Scaffolding practices: a study of design practitioner engagement in design education. *Design Studies, 45*(A), 9–29. https://doi.org/10.1016/j.destud.2015.12.006.

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco: Jossey-Bass.

Oh, Y., Ishizaki, S., Gross, M. D., & Do, E. Y.-L. (2013). A theoretical framework of design critiquing in architecture studios. *Design Studies, 34*(3), 302–325. https://doi.org/10.1016/j.destud.2012.08.004.

Rich, P. J., West, R. E., & Warr, M. (2015). Innovating how we teach collaborative design through studio-based pedagogy. In M. A. Orey & R. M. Branch (Eds.), *Educational media and technology yearbook* (Vol. 39, pp. 147–163). Switzerland: Springer International Publishing.

Salama, A. M., & Wilkinson, N. (2007). Introduction: Legacies for the future of design studio pedagogy. In A. M. Salama & N. Wilkinson (Eds.), *Design studio pedagogy: Horizons for the future* (pp. 3–8). Gateshead: Urban International Press.

Sawyer, R. K. (2017). Teaching creativity in art and design studio classes: a systematic literature review. *Educational Research Review, 22*, 99–113. https://doi.org/10.1016/j.edurev.2017.07.002.

Schön, D. A. (1985). *The design studio: An exploration of its traditions and potentials*. London: RIBA Publications Limited.

Schrand, T., & Eliason, J. (2012). Feedback practices and signature pedagogies: what can the liberal arts learn from the design critique? *Teaching in Higher Education, 17*(1), 51–62. https://doi.org/10.1080/13562517.2011.590977.

Shaffer, D. W. (2003). *Portrait of the oxford design studio: An ethnography of design pedagogy*. WCER Working Paper No. 2003–11. Wisconsin Center for Education Research.

Smith, K. M. (2015). Conditions influencing the development of design expertise: as identified in interior design student accounts. *Design Studies, 36*, 77–98. https://doi.org/10.1016/j.destud.2014.09.001.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks: Sage Publications.

Thiessen, M. (2017). I don't know, I just like it: exploring how design students think about criticism. *Art, Design & Communication in Higher Education, 16*(2), 145–156. https://doi.org/10.1386/adch.16.2.145_1.

Topping, K. J. (2009). Peer assessment. *Theory Into Practice, 48*(1), 20–27. https://doi.org/10.1080/03075070600680836.

Webster, H. (2006). Power, freedom and resistance: excavating the design jury. *The International Journal of Art & Design Education, 25*(3), 286–296. https://doi.org/10.1111/j.1476-8070.2006.00495.x.

Wilson, B. G. (2013). A practice-centered approach to instructional design. In J. M. Spector, B. B. Lockee, S. E. Smaldino, & M. Herring (Eds.), *Learning, problem solving, and mind tools: Essays in honor of David H. Jonassen* (pp. 35–54). New York: Routledge.

Wood, D., & Kurzel, F. (2008). *Engaging students in reflective practice through a process of formative peer review and peer assessment*. Paper presented at the ATN Assessment Conference 2008: Engaging Students in Assessment.

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

Zamberlan, L., & Wilson, S. E. (2015). Developing an embedded peer tutor program in design studio to support first year design students. *Journal of Peer Learning, 8*(1), 5–17.

Zamberlan, L., & Wilson, S. E. (2017). "Conversation leading to progress": student perceptions of peer tutors' contribution to enhancing creativity and collaboration in a first year design studio. *Journal of Peer Learning, 10*(1), 59–75.