

## Critique Assemblages in Response to Emergency Hybrid Studio Pedagogy

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Studio education focuses on active learning and assessment that is embedded in students' exploration of ill-structured problems. Critique is a central component of this experience, providing a means of sensemaking, assessment, and socialization. These critique sessions encompass multiple types of interactions among students and instructors at multiple levels of formality. In most design programs, these practices have been situated in a physical studio environment—until they were disrupted by the COVID-19 pandemic. As a group of educators and design students, we used this disruption as an opportunity to reimagine means of critique engagement. In this paper, we document the creation, piloting, and evaluation of new critique assemblages—each of which bring together a group of technology tools, means and norms of engagement, and channels of participation. We report both on the extension of existing critique types such as desk crits, group crits, and formal presentation crits, describing both the instructional goals of the new critique assemblages and the students' experience of these assemblages. Building on these outcomes, we reflect upon opportunities to engage with new hybrid critique approaches once residential instruction can resume and identify patterns of socialization and wellbeing that have emerged through these assemblages that foster critical reflection on studio practices.

Keywords: critique, studio pedagogy, hybrid educational practices

### Introduction

Studio education focuses on active learning and assessment that is embedded in students' exploration of ill-structured problems (Boling et al., 2016). Critique is a central component of this experience, providing a means of sensemaking, assessment, and socialization (Dannels et al., 2008; 2013; McDonald & Michela, 2019), encompassing multiple types of interactions among students and instructors at multiple levels of formality and with differing levels and types of participants. Critique practices have a long tradition as one of the core components of studio practice—part of what Shulman (2005) has termed a “signature pedagogy.” However, critique practices have been adapted over time, across design disciplines, and through a range of technological supports (Easterday et al., 2017; Gray, 2019; Jones et al., 2019; Kvan, 2001; Maher et al., 1996).

While there are important virtual examples of critique, such as the virtual studios at the Open University (Jones et al., 2019) and Marshalsey and Sclater's (2020) response to COVID-19 with “distributed studios,” the majority of critique practices have been historically situated in a physical studio environment. The pandemic disrupted these practices but provided an opportunity to reimagine means of critique engagement. While we recognize that the urgent pivot to online instruction in Spring 2020 due to the COVID-19 pandemic, and as such we cannot claim that our efforts constitute a deep and considered development of a technology-enhanced online learning environment, instead agreeing with Hodges et al. (2020) that our efforts began as an attempt to pivot to emergency remote teaching, the critique assemblages we have built during the pandemic have served as important reflective tools, serving as a stimulus for reconsidering the role of critique practices



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in both the physical and virtual studio environment, and we frame our contribution to the design education literature in this spirit.

In this paper, we document these early pilots of different “assemblages” of critique supports, with varying numbers of participants, means of engagement, channels of participation, and opportunities for reflection and deliberation across two different user experience (UX) design courses as these courses moved to hybrid or fully virtual environments. By critique assemblage, we refer to not only the technologies used to support the critique and the social practices that are enacted and supported by these technologies, but also the praxis of engagement and the norms that are performed, strengthened, or in tension through the assemblage. The purpose of this paper is to characterize these critique assemblages and the ways they enabled hybrid and virtual critique interactions and connect the critique interactions to broader historical notions of critique activity in the design studio. We seek to answer the following two research questions in this paper:

- 1 What critique assemblages were used to pivot from residential studio instruction to online or hybrid instruction?
- 2 What are the affordances of these assemblages and how were they experienced and participated in by students and instructors?

## Related Work

Over the past two decades, scholars have documented the communicative characteristics of critique, however, this knowledge is largely constrained to a particular physical arrangement with a familiar set of interlocutors (e.g., Dannels & Martin, 2008; Oh et al., 2012). In the sections that follow, we will briefly outline prior work relating to modes of critique, the interest of critical scholars in building studio experiences that are more equitable, and existing approaches to supporting critique practices through technology.

### *Critique and Studio Education*

Critique is used to teach disciplinary knowledge and techniques “just-in-time” (Uluoğlu, 2000), facilitate provision of feedback on student projects (Gray, 2019), inspire reflection on how what is learned can be applied to future efforts (Choi & Rhoades, 2020), and engage students in disciplinary modes of communication (Dannels et al., 2008; Hokanson, 2012; McDonald & Michela, 2019). Critique is increasingly common in online spaces adjacent to creative work (Kou & Gray, 2017; Luther et al., 2015), however, most studio courses rely heavily on physical engagement with critique in a physical setting (e.g., Schön, 1985). Thus, our approach builds upon what is known about critique in physical and digital environments, leveraging pilot work on increasing participation through multiple parallel modalities of critique (Easterday et al., 2017; Gray, 2019).

Design education scholars have described types of critique practices along multiple dimensions. Blythman, Orr, and Blair (2007) articulated a range of critique types in architecture education by differing levels of formality and purpose. Oh et al. (2012) later articulated this diversity in relation to levels of formality, degree of privacy or public access, and number of participants. Across both Oh et al. (2012) and Hokanson’s (2012) analyses of critique types, four main categories emerge: the **desk crit** (low in formality and number of participants), the **group crit** (slightly higher in formality with more public access), the **interim review** (higher formality with more participants), and the **public critique or jury** (highly formal and high stakes with high public access). In this paper, we will rely on this typology, focusing on desk crits, group crits, and final presentation crits (somewhere between an interim review and jury).

### *Critical Views of Studio and Student Autonomy*

Despite the widespread use of the studio approach in design education, numerous scholars have critiqued the power structures implicit in studio and critique practices, particularly in relation to student autonomy, power relations, and crunch culture (Anthony, 1991; 2007; Dutton, 1991; Gray & Smith, 2016). A strand of research has described the power dynamics between students and instructors in the studio environment, with Crysler (1995) noting that “faculty have tremendous power over students” in the studio program leading to “sexist and discriminatory behavior” as well as “verbal abuse, foul languages, and destructive comments at the end-of-year juries” in the context of architecture education. Other critical scholars such as Dutton (1991), Webster (2006, 2008), Gray (2013), and Blythman et al. (2007) have critiqued a variety of patterns of abuse that are often considered a part of studio’s “hidden curriculum”—harmful norms that are implicitly supported and performed through the rituals of studio. These critique structures are impacted negatively both by the common interpretation of Schön’s model of knowledge building, which was highly individualistic, focusing on the interactions between the individual student and a single expert tutor, without considering “all people learn all the

time”, according to a critique by Webster (2008). In addition to these concerns, Willenbrock (1991) and Dutton (1991) underscored the need to critically engage with these power imbalances and abuses, with Dutton calling for educators to “encourage students to voice their difference from normative values and histories to better understand the relations of power that construct their social subjectivity.” In our work, we seek to connect these critical discourses with the concerns of power latent in the performance of the crit.

### *Technology-Supported Modes of Critique*

Increasingly, technology is being used to support the aims of critique practices—both in the studio (e.g., Easterday et al., 2017; Gray, 2019; Gray & Howard, 2015) and using crowdsourced implementations to support creativity support among novices (Cheng et al., 2020; Luther et al., 2015). In this paper, we focus on efforts to extend the support of critique practices in the context of studio education, building on the ad hoc uses of technology reported in Gray and colleagues’ work and the purpose-built system described by Easterday and colleagues. In Easterday et al.’s (2017) system, the crowd critique model was intended to provide a wide range of functionality, including “quick invite tools; formative framing; a public, near-synchronous social media interface; critique scaffolds; “like” system; community hashtags; analysis tools and to do lists; along with social practices including: prep/write-first/write-last script and critique training.” In contrast, the system described by Gray (2019) emerged organically through the efforts of fellow students with the goal of building “critique capacity,” using off-the-shelf tools such as Google Docs to “provides multiple channels for interaction and learning during presentations and shows how learner engagement might be productively—and substantially—increased within the time and physical constraints of the critique.” In this paper, we will be focusing our attention on the creation of assemblages of *existing* tools rather than a purpose-built system, describing how we formed connections among these tools to support practices similar to those performed in a residential studio environment.

## **Methods**

In this study, we used an auto-ethnographic approach to identify instructional decisions relating to hybrid critique practices to identify characteristics of critique assemblages. In conjunction with these data, we also collected data from course critique experiences using these assemblages and conducted a small interview study to elicit student experiences of these critique events.

### *Study Context*

We focus this study on the experiences of students and instructors in three User Experience (UX) Design studios taught during the Spring 2020 and Fall 2020 semesters. These studios included a first-year undergraduate experience that began in a residential mode and was then disrupted due to the pandemic mid-semester (n=45), a second-year undergraduate experience that was conducted using a hybrid synchronous approach (n=42), and a first-year graduate experience also conducted with a hybrid synchronous approach (n=12). The residential studio model used prior to the pandemic included multiple critique events, including desk critiques with project team groups, group critiques that utilized the physical space to pin up and post in-progress work for feedback, and formal presentations that included opportunities for multimodal interaction using Slack. During the pivot to online instruction due to the pandemic in March 2020, we shifted Spring 2020 courses completely online for the latter half of the semester, relying upon Slack, WebEx, and Mural to communicate and share design work. During the Fall 2020 semester, we used a hybrid synchronous approach to allow a portion of students to attend class in person (socially distanced and masked) with the remaining students joining via a synchronous Zoom session. All group critiques and formal presentations critiques were conducted only synchronously online, with no residential participation.

### *Data Collection*

Data sources to document the creation and student experiences of the critique assemblages included critique session recordings, instructor and student reflections, student surveys, and student interviews. As a team of authors, we intentionally included multiple perspectives in relation to the designed critique events. The last author was the instructor or co-instructor for all three UX studios, the first and second authors were students in the graduate studio offered in Fall 2020 while one of them worked on data analysis for this project, and the third author previously experienced the two undergraduate studios when they were offered prior to the pandemic in residential form. In this way, we were able to triangulate multiple perspectives relating to the previous physical construction and performance of the crit, adaptation needed to address emergency hybrid requirements, and emergent student experiences of these critique events. While we have multiple points of data

through which to triangulate these student experiences and critique assemblage qualities, our focus in this paper is on the properties of the critique assemblages (supported by video recordings, JSON output of Slack critique events, and Mural or Miro virtual whiteboard PDFs) and the student experience of these assemblages (supported by interviews with undergraduate and graduate students during the Fall 2020 semester), and we do not always differentiate between these experiences of the critique assemblages by course or semester. Instead, the critique assemblages which we describe in this paper can be considered as the outcomes of iterative construction, student engagement, and subsequent alteration with a primary focus on the undergraduate studios (due to their larger enrollment). Critique sessions that we evaluate within this framing include: 12 group critiques, weekly desk critiques on demand, and 11 final presentation critiques. The undergraduate students that experienced these critiques enrolled as a cohort in the UX studio in Spring 2020 and Fall 2020; the graduate students matriculated in Fall 2020 and were only represented in that portion of the dataset. As part of the interview study, the student authors conducted 30-45 minute interviews with five undergraduate and five graduate students using a semi-structured interview protocol that focused on their experience of critique sessions during the Fall 2020 semester, including the relative value of the feedback from these sessions and an invitation to identify portions of these learning experiences that they wished to change.

### *Data Analysis*

We conducted two primary forms of analytic activities to support our project aims as a means of triangulating across data sources while seeking to build trustworthiness in relation to our reflective outcomes. First, we engaged in regular reflection sessions to externalize our decision-making processes, including expectations regarding critique outcomes and key affordances of the assemblages we created. During these virtual meetings, conducted throughout the Fall 2020 and Spring 2021 semester, we discussed challenges relating to our “pandemic pedagogy,” discussed student responses to previous versions of critique assemblages, and identified new potential productive areas for experimentation. Second, we used a reflexive thematic analysis (Braun & Clarke, 2019) approach to analyze interview and reflection data, with a particular focus on connecting student experiences to particular critique types and outcomes. This analysis was also conducted over a period of months, with the student and instructor experiences informing the overall blueprint for each assemblage. Our goal in this analysis stage was to complicate and pluralize the critique experiences, helping us in identifying both instances where negative experiences led to positive overall outcomes and instances where students unexpectedly enjoyed critique experiences that were hastily created. Across these two analysis activities, we were better able to understand the decisions that led to the creation of the critique assemblages, and we built a shared awareness regarding how these critique experiences impacted the instructor and student experience.

## **Findings**

### *Critique Assemblages*

We created a variety of critique assemblages to pivot from residential studio instruction to synchronous hybrid instruction. These assemblages all represented a significant departure from physical critique practices used prior to the pandemic and included a rapidly changing suite of technology tools (Table 1), some of which had been previously used in a more limited sense prior to March 2020. Since 2015, the messaging platform Slack<sup>1</sup> had been extensively integrated into course and program experiences, facilitating conversations among students and alumni across multiple cohorts, creating spaces for team discussion in our project-based collaborative studios, and supporting residential critique practices in formal presentations through what Gray (2019) has previously called a “multimodal critique.” In addition to interactions on Slack, all critique sessions prior to the pandemic were video recorded on GoPro cameras and distributed on the learning management system course site to encourage reflection on communication and design competencies.

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<sup>1</sup> <https://slack.com/>

Table 1. Summary of technological tools used to support different types of critique.

Critique Type	Zoom	Miro	Slack	Google Docs
Formal	•		•	•
Group	•	•		
Desk	•			

In the following sub-sections, we will describe how three types of critique (Desk, Group, and Formal Presentation) previously existed in the in-person studio space and how each was adapted to accommodate pandemic-era restrictions and provide new modes of participation.

### Desk Critique

Desk critiques entail one-on-one interactions between student teams and one or more instructors, with a focus on discussing in-progress design work. In residential UX studios, instructors would meet with student teams in the studio space during regular classroom instructional time. Because student teams were tasked with the same project prompt, these in-person critiques allowed for incidental learning by other student teams within earshot of an in-progress desk critique as well.

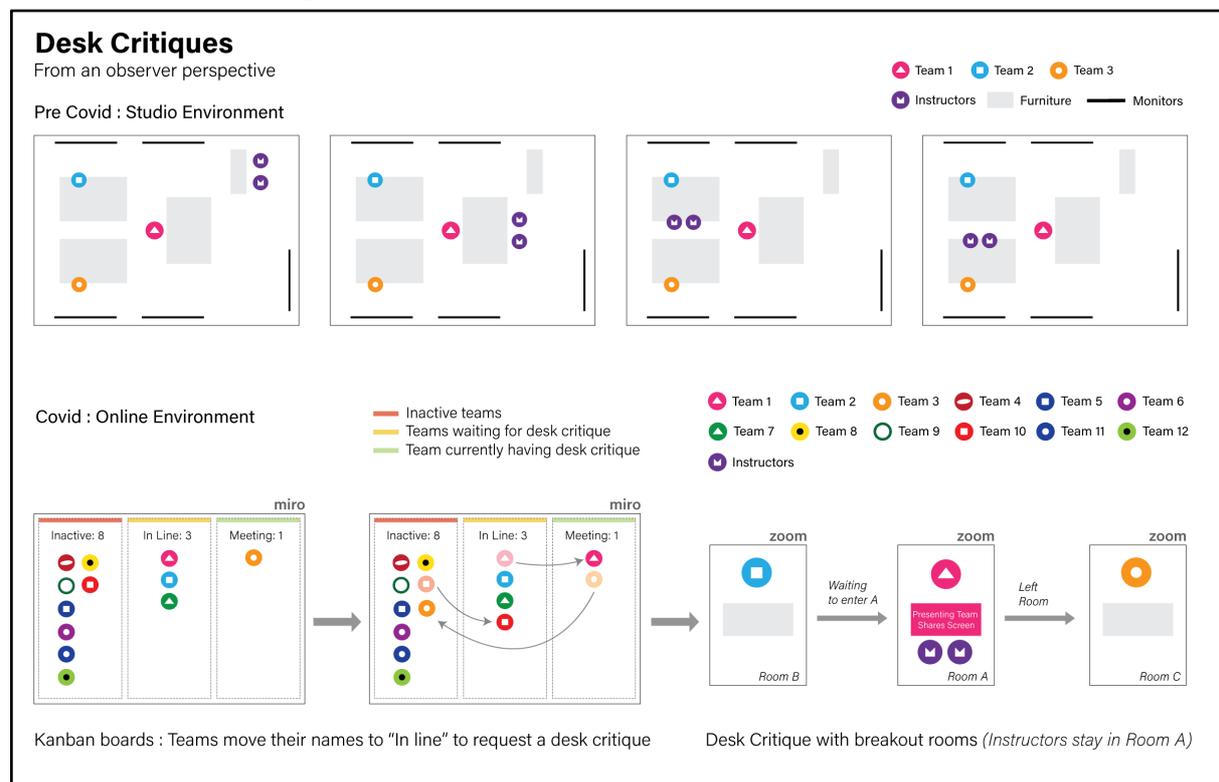


Figure 1. A desk critique assemblage that engaged students through Miro and Zoom.

In order to adapt to a virtual setting, the instructor wanted to encourage the just-in-time and student-directed qualities of desk critiques as they had existed in the residential studio. This assemblage consisted of the following elements: 1) a virtual whiteboard to indicate a team’s desire to receive a desk crit, and 2) video conferencing in breakout rooms to allow the instructor to privately meet with the students and have a discussion (Figure 1). Using Miro<sup>2</sup>, a virtual whiteboard space, instructors created a Kanban-style board with project team names organized into three columns. During open studio time, project teams worked in breakout rooms on Zoom,

<sup>2</sup> <https://miro.com/>

and had the opportunity to move their respective team's name from the "Inactive" column to the "Request a desk crit" column. Multiple project teams could queue in the center column, and then the instructional team would sequentially join the relevant team breakout room in Zoom and move the team name to the "Currently meeting with" column. Once within the breakout room, the instructor(s) would engage the group in conversation, providing feedback on in-progress design ideas. Sharing of student screens was often a key component of this assemblage, where students could quickly share in-progress work with each other and the instructor.

While this assemblage allowed for one-on-one discussion between students within the single team and instructor(s), this assemblage did not afford any incidental learning or accidentally "overheard" qualities that would have been common in a residential studio. However, the Zoom format was also more equitable in the sense that all students had equal access to shared content and high-quality shared audio with limited background noise, as concentrated with the cacophony of the residential studio when up to 50 students were working and speaking at once.

### **Group Critique**

Group critique underwent arguably the most significant change when instructors were forced to adapt to pandemic-era restrictions. Previously, group critique, often referenced by the memorable "gallery walk" component by interviewees who had experienced pre-COVID in-person critique, consisted of student teams presenting their in-progress work within the residential studio space using a variety of outputs including whiteboard drawings, sketchbooks, printouts of research, and physical prototypes. The gallery walk was accompanied by music as students and instructors traversed the studio space, looking at project outputs and taking notes that would seed conversation with each team in the question-and-answer portion of the crit. Once the gallery walk was complete, teams would present their work to the class and then engage in questions and receive feedback from their peers and instructors. Once feedback for one team had ended, another team would present and receive feedback, with the need for instructors and students to move physically through the studio space to engage with project outputs.

Instructors pivoted to the online collaborative whiteboard tool Miro as a means of supporting group critique sessions (Figure 2). Prior to a scheduled group critique, student teams would asynchronously upload pieces of their in-progress work to a dedicated Miro board using the program's built-in features. Once the synchronous class session began, teams briefly presented their work and core questions they wanted feedback on to other teams, leading to a virtual version of the "gallery walk" where students were asked to peruse this same Miro board and comment on other teams' work using a combination of Miro's features (e.g., sticky notes, text boxes). The instructors would typically play music during this time as well through Zoom. Once the allotted time expired, students had the opportunity to ask clarifying questions verbally via Zoom about feedback left on their project, provide verbal feedback on other teams' projects, and/or expand upon their own comments left on other teams' work.

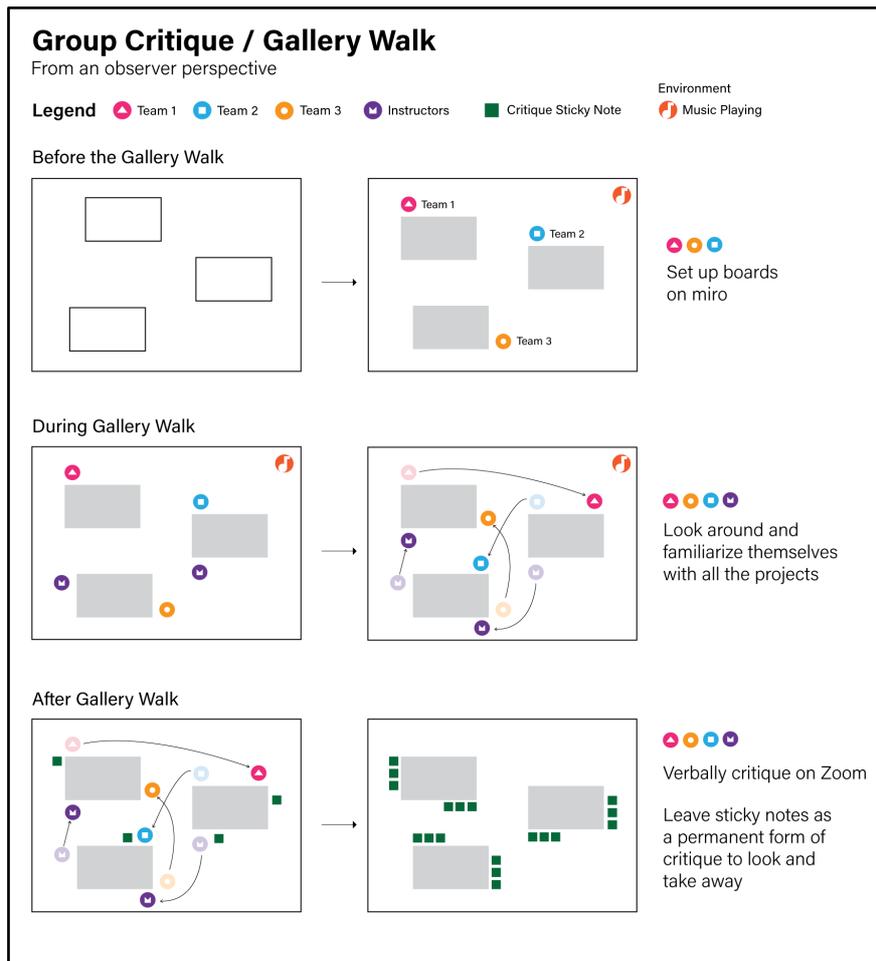


Figure 2. A group critique assemblage that engaged students through Miro and Zoom.

Unlike the in-person group critique sessions, this virtual critique assemblage provided significantly more equity in participation with fewer issues being heard or being able to provide feedback. From a logistical perspective, students did not have to physically post or dismantle their project outputs as they had in the residential studio, allowing Miro outputs to be added as a team well in advance of class, and allowing these outputs and subsequent feedback to remain persistent for them to revisit later in the project cycle. Importantly, the Miro-supported group critique also allowed for greater density of participation within a single project or across multiple projects. There was no vying for the best view of the physical artifacts, and indeed—dozens of students could easily view the same virtual outputs at the same time with the same level of fidelity and ability to engage by leaving feedback.

#### **Formal Presentation Critique**

Formal presentation critique sessions previously consisted of a team presenting their completed work using wall-mounted displays in the physical studio space. In addition to this visual interaction, instructors also created a dedicated channel on the channel-based messaging platform Slack for each formal presentation, often inviting upper-level students to join the critique session and provide feedback both during the presentation and during the verbal question-and-answer period. In addition, upper-level students often collaborated on a synthesis of critique using Google Docs to meet professional practices course requirements, with the document delivered to the lower-level students at the conclusion of the day's presentations.

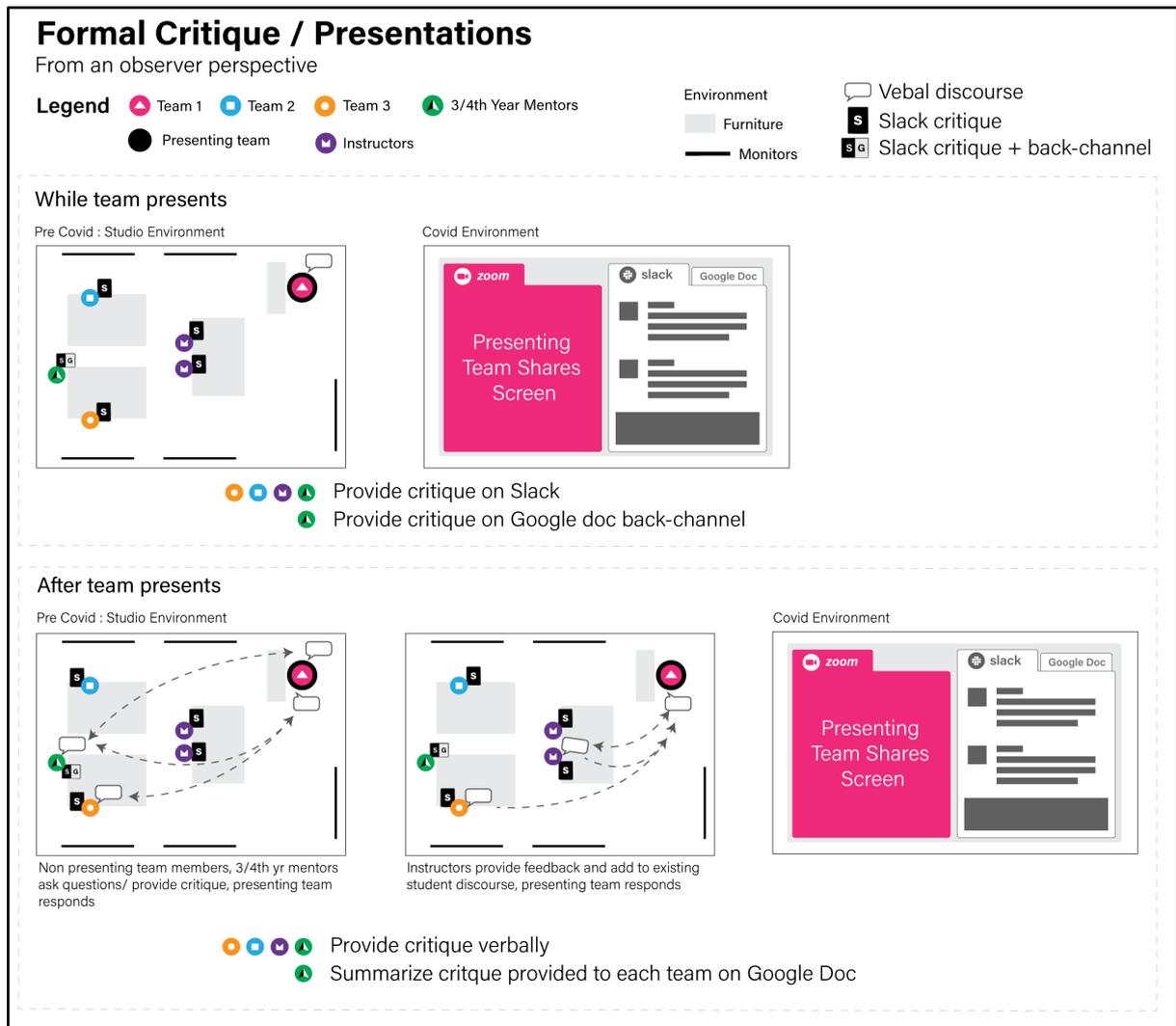


Figure 3. A formal critique assemblage that engaged students through Zoom, Slack, and Google Docs.

Aside from using Zoom to present final work, the formal presentation critique assemblage did not require the introduction of any other new technology. Using Zoom to support the final presentations surprisingly amplified the level of participation compared to the physical equivalent. While upper-level student participation was previously bound by the number of available seats in the studio, more students could join the Zoom call—and their presence increased the amount of critique being provided in Slack and Google Docs in ways that counterbalanced a small decline in engagement from other students due to “Zoom fatigue.” In addition to the increased capacity for the critique event, there were also areas of growth and opportunity in relation to the use of video conferencing software. While early presentations included some technical glitches as students became accustomed to the need for screen sharing preferences and became confident in speaking as a team at a distance, these issues were quickly resolved, allowing for quick transition time among speakers as compared to an in-person critique. Because everyone was joining the same Zoom space, audio quality and the ability to hear and accurately respond to questions was also much higher as compared to the in-person critique equivalent. In addition, the recording and transcription functionality of Zoom in the cloud also allowed for the ability of students to effectively reflect upon their presentation behavior, with the capability to search for text in the automatically generated transcript. Thus, in some ways, this critique assemblage became more equitable and accessible—in ways that are still being discovered as we investigate longer-term patterns of development of critique competence.

### *Affordances and Student Experiences of Critique Assemblages*

The critique assemblages that we created and piloted in Spring 2020 and Fall 2020 had a wide variety of affordances, some of which were known and anticipated, and all of which were experienced in similar yet unique ways by students and instructors.

### ***Desk Critique***

The specific mention of desk critique as a studio practice seldom appeared during our interviews with the UX students. However, when asked about prior critique experiences, one graduate student who had been part of the program as an undergraduate (and thus had experienced in-person desk critiques) mentioned how the desk critique is often the most beneficial because “you get more one-on-one—[the instructors] understand more of the project” but went on to mention how they could not recall engaging with this particular type of crit during the Fall 2020 semester. Based on results of a mid-semester survey to students in both UX studios to get feedback on a multitude of critique-related items, when students were asked about the frequency of desk critiques, 21 of the 38 undergraduates respondents wanted more of this type of critique, while 27 of these same students selected “always” when asked how often they applied feedback from desk critique to their projects. These survey results and a lack of reflection on desk crits in the graduate UX studio underscore some of the unique challenges in socializing practices which are intensely physical, embodied, and performative in the residential studio, and do not directly translate into the online space. The undergraduate UX students had learned patterns of engagement with desk crits during the Spring 2020 semester, and thus both had a conceptual image of what desk crits “looked like” and how they could be translated as more private conversations in Zoom breakout rooms. However, graduate students took longer to recognize both the value and the unique structure of desk crits in the online space.

While we have previously documented how desk critiques mostly took place via a combination of Zoom Breakout Rooms and scheduling in Miro, one graduate interviewee also discussed how an impromptu extended discussion between their team and an instructor in their team Slack channel acted as a desk crit of sorts. The interviewee explained how “[the instructor] had given [our team] a really good idea to explore, the unfortunate thing was we only had a week left and every contact we had basically just kept falling through” but believed if the team had “more time, [we] would have been able to really do something with it.” This conversation—while disconnected from both the Zoom classroom and somewhat asynchronous, still provided the team with just-in-time feedback they could use to alter their project scope and outcomes. This range of experiences underscores the difficulty in effectively translating and socializing desk critiques in a single semester, particularly with students such as the graduate students who lacked a mental model for the purpose, value, and experience of engaging in these critiques. For undergraduate students that already had a mental model, this translation into the online Zoom space resulted in a new assemblage through which most of the physical practices relating to desk crits could be translated.

### ***Group Critique***

When talking about group critique experiences prior to COVID-19 (colloquially referred to only through one portion of the critique—the “gallery walk”), one undergraduate student stated how “[Miro was] very similar to what we started with, which was going with our project groups and working on the whiteboards and interacting with each other...[so it’s] nice to see real time feedback, and collaboration, and all of those things.” This use of Miro to support a group critique assemblage translated most literally from the residential version, with students feeling relieved that they had more time (and space) to post their materials, as opposed to at the beginning of class (Figure 4). In addition, this assemblage afforded both a sense of social presence (via collaborators’ cursors in Miro) which reconstructed some of the studio “buzz” of an in-person gallery walk, while also affording quasi-permanence. After the crit concluded, students still had access both to their own materials and comments left by fellow students, but also access to other teams’ materials and a comprehensive Zoom recording of the entire session with screen sharing to archive the entirety of the experience.

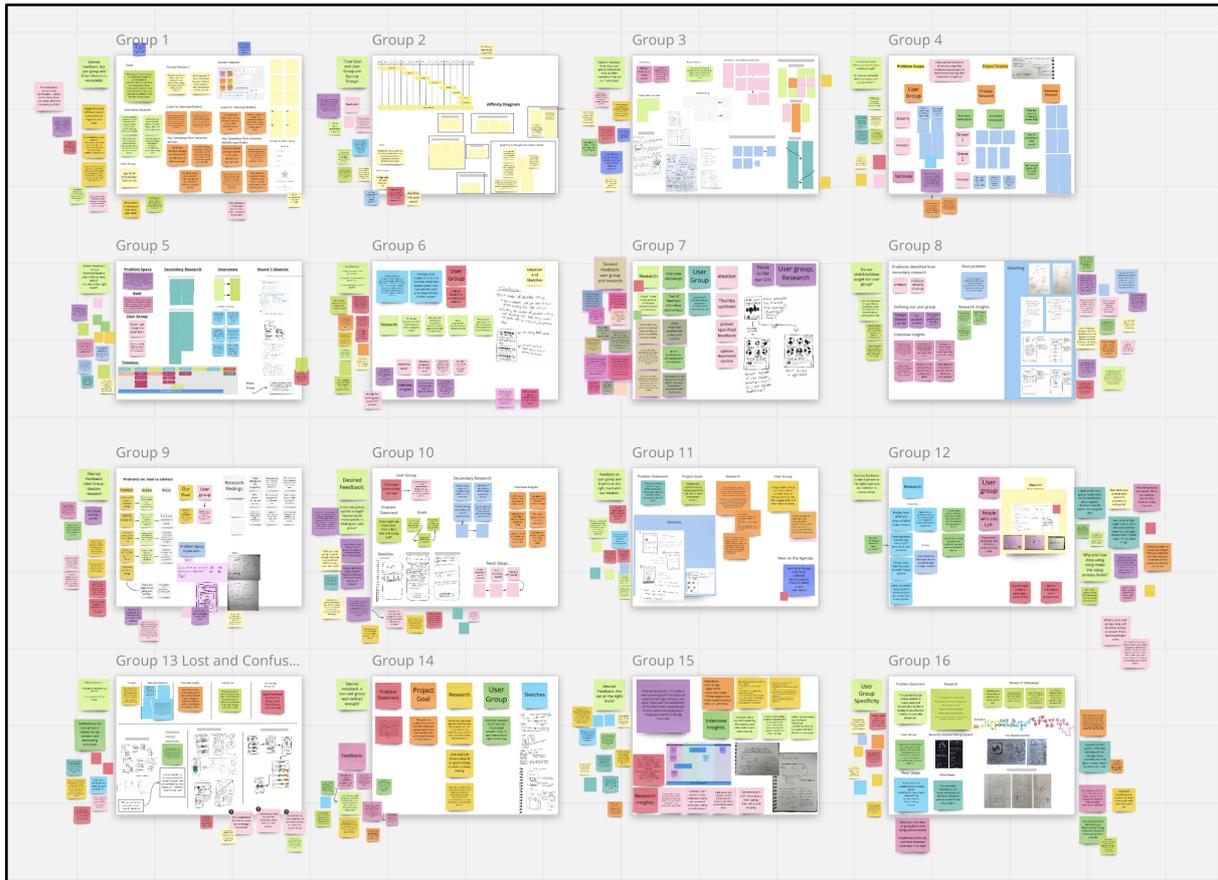


Figure 4. An example of a group critique Miro board with content from each team within each frame and comments surrounding the periphery of each frame from both students enrolled in the studio and upperclasspersons joining the session.

This assemblage of using Miro and Zoom to facilitate group critique was embraced by other interviewees as well, highlighting the ability to share, express, and communicate in-process design work with others. When discussing the final project of the semester, one graduate said “I think we found a good use of Miro...[and] hope we continue to share information, working together, and build up on that community...because I feel like that’s the start of actually communicating and being able to express our thoughts in a more effective manner.” However, this assemblage also introduced new challenges—most obvious to students that had previously experienced a more immersive in-person group crit. One undergraduate recalled how virtual learning came with challenges, noting how being online made it difficult “to give valuable, insightful feedback...because there is no dialogue happening...[because] we’re all muted...and you just have to kind of work with what [teams] put in Miro. So it’s a lot more difficult to get a fuller picture of what’s going on.” This lack of emergent discourse within the Miro environment did present a substantial limitation to interpersonal interaction, even while the overall quantity of critique feedback (measured in numbers of questions and notes) increased dramatically.

### **Formal Presentation Critique**

Formal presentation critiques as an assemblage were the least impacted by the shift to online synchronous instruction. In previous years, students had already been socialized to using Slack and Google Docs to create conversation around final design work, and some students also used the provided recordings and Slack conversation to reflect on their progress and decide on how to improve their work. To understand this particular critique assemblage further, we analyze all of the Slack posts from the formal presentation critique sessions for both studios in order to determine levels of engagement throughout the Fall 2020 semester, using the same type of analysis to previous semester presentations for the same studio to provide a comparison between pre-pandemic in-person and synchronous online formal presentation crits.

Three formal critique sessions were conducted in the undergraduate UX studio during the Fall 2020 semester. Participation through the semester remained fairly consistent, peaking in the middle of the semester with 422 unique feedback instances compared to 327 early in the semester and 347 at the end of the semester, all across an approximately 150-minute crit session. An average of 365 instances of feedback occurred across all

these formal presentation critique sessions, totaling 1096 critique statements. In the critique sessions from the 2019 Fall semester, we found 884 unique pieces of feedback across all three critiques, with an average of 294 critique statements per formal crit. These results demonstrate that critique interaction roughly scaled based on course enrollment (2019 n=33; 2020 n=39), even given the virtual conditions in 2020.

While student experiences of this critique assemblage were not as dramatically different, the affordance of interacting only online did provide the opportunity for different follow-on behaviors. One interviewee described how “right after the [formal presentation] critique, I talked to my teammate...about all the feedback, in our private project channel.” This ability to communicate privately and immediately following a presentation allowed team members to discuss the feedback they’d just received while it was fresh in their minds, instead of waiting until the end of the critique session. While not our direct object of study, Slack’s built-in emoji reactions often served as a way for students giving critique to agree with other peer’s feedback in ways that transcended both in-person and online final presentation critique sessions. For example, when a student posted feedback to the critique channel during or after a presentation, others would react with the “point up” emoji to indicate they had a similar question or thought. This emoji reaction was the most common reaction seen in our analysis of the Slack transcripts, with the “thumbs up” close behind. The ability to react to a person’s feedback could be viewed as engaging with the critique despite not verbally or non-verbally communicating feedback.

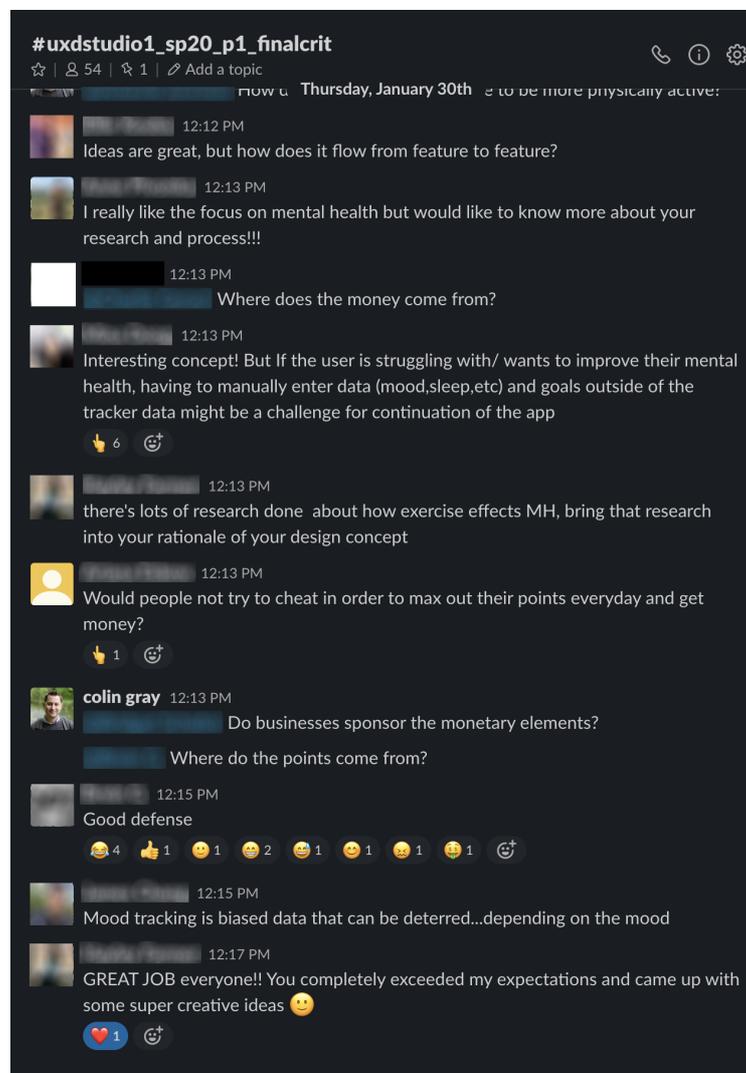


Figure 5. An example of a final presentation Slack critique channel, including questions and critical feedback alongside supportive emoji to represent agreement or social support.

Another aspect of critique relating to engagement on Slack was the use of phatic comments. Despite being less common in the graduate studio—perhaps due to less opportunities for socialization in their first semester due to social distancing and unfamiliar course experiences—phatic expressions were frequently identified in all undergraduate formal presentation critique sessions. These expressions made up 21% of the total comments from our analysis of this course’s Slack feedback, underscoring the utility of Slack as building affordances both for on-topic and off-topic banter as revealed by Gray and Howard (2015) in a previous study of technology enhanced critique environments. Examples of the use of phatic comments included students making a joke or commenting about something not directly related to the project being presented, often interspersed directly between critique comments much more germane to the design work being presented. These types of comments clearly played a role in the critique experience in ways that could be more fully explored in future work, particularly in relation to phatic expression and links to formal critique and as a form of socializing that then enables other critique practices.

## **Discussion**

Based on these findings, we have identified opportunities and challenges to support and extend critique practices in studio education, across both virtual and residential modes. In this section, we will briefly outline opportunities to engage with deeper socio-technical and critical awareness once residential instruction can resume, identifying patterns of socialization and wellbeing that support students’ autonomy and agency.

### *Permanent and Temporary Changes in Design Studio Critique Environments*

We have constantly reflected while building and modifying these critique assemblages, considering the possibility of some of these tools may become a permanent element of our UX studios, or greatly impact our current engagement with technologies to support critique. While Slack was effectively used in pre-pandemic critique sessions, Miro was a new addition that has the potential to remain a fixture going forward, due to its affordances of persistence, legibility, and cross-pollination, all while removing accessibility barriers to full participation in the studio. However, this shift in material from the physical to digital space also presents new potential challenges in residential instruction, including a lack of felt embodied presence in the studio, leaving the studio “buzz” in a technology platform even while in-person engagement will be desired. One of the heuristics we are evaluating in the next generation of our teaching approaches—where we seek to teach studio at scale—is the role of technologies in supporting a range of student needs and accessibility profiles. In particular, we have become more aware of the limitations of engagement for neurodiverse students that now have access to full automated transcriptions of critique sessions, who may be negatively impacted when we return to residential instruction where audio quality and legibility varies more significantly. We have also considered how to support some of the increased privacy of the breakout room desk crits, while not sacrificing the “overhearing” qualities of this critique type. Finally, while we see value in extending the crit through technology tools, we are challenged to consider how these critique assemblages might better balance in person, embodied engagement alongside technological interaction, allowing students both to feel “present” and to be able to fully participate as a critic, a fellow designer, and as a colleague.

### *Socialization and Well-Being*

The topics of socialization and well-being arose often during our interviews—building upon critical dimensions of the studio experience we had deeply considered as we built out this UX program in 2015. Many students understandably felt isolated due to the pandemic and had difficulty connecting with other members of their cohort, particularly those that were new to the graduate program who did not build relationships face-to-face prior to the pandemic. As one interviewee discussed, “we haven't really been able to get much face-to-face contact...[but] that's something we are trying to do more though...trying to reach out through social media or Slack, you know, the random channel just posting stuff.” Slack played a pivotal role in the formal presentation critique environment while functioning as a social tool as well, providing a centralized location for those enrolled in the program to converse, in both private and public channels, and develop a rapport with each other despite the lack of in-person socialization opportunities during the pandemic.

However, this constant use of technology in the remote environment—while pragmatically necessary—brought challenges. Despite the “Zoom fatigue” felt by many, one interviewee didn’t “necessarily think it [was] the technology that [was] hindering engagement...it [was] a person's want or drive to be participatory.” When asked about their expectations for critique, the same interviewee thought the sessions would “be more conversational...[with] people feeling okay to voice their opinions.” Through our analysis, we learned that students were more likely to provide written feedback via the use of Slack, rather than comment verbally via Zoom,

even if they reported that they would prefer conversational, verbal engagement. This is a tension that was already known in the residential studios, but we now have a better understanding of how these social and technological components of the assemblages function and can use this knowledge both to scaffold students' socialization and ability to "speak up" while also recognizing the reality of cognitive fatigue.

Building on these experiences from 2020, we have continued to adapt our critique assemblages to meet the needs of even more students through hybrid instruction. While we do not claim to have addressed all of the issues mentioned above, we find the language of critique assemblages to better describe the complexity of critique—moving beyond notions of critique as primarily performative or knowledge-building. Instead, we have found our focus on critique to point to new opportunities to support students' wellbeing, identify threats at the "hidden curriculum" level, and continuously assess our roles as instructors in building equitable critique environments. Future work could address perceptions of critique experiences over time, and the role of these experiences in reproducing certain cultures of interactions that may be informed, or even inhibited, by particular combinations of technological tools.

## Conclusion

In this paper, we describe a set of critique assemblages that bring together social and technological practices that allowed our studio pedagogy to be resilient during the online instructional response to the pandemic. Across desk, group, and formal critique types, we identify a set of technological tools that built on existing studio practices, and in many cases facilitated the identification of new affordances that may shape future residential studio experiences. We conclude with opportunities to consider wellbeing and socialization through critique engagement and strengthen student identity development in online and residential studio programs.

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