Designerly Talk in Non-Pedagogical Social Spaces

Colin M. Gray
Indiana University Bloomington
comgray@umail.iu.edu

Craig D. Howard
Texas A&M University - Texarkana
craig.howard@tamut.edu

Abstract

Students live and work in worlds where virtual communities, such as those created via social network sites (e.g. Facebook) may interplay with their formal learning, but scholars of design pedagogy know little about how these spaces can support design learning. In this study, we describe how a set of informal communications, encapsulated in five student-created and managed Facebook groups, functioned as part of the overall pedagogy in an interaction design Master's program. We discuss ways in which students may learn in these spaces apart from the formal curriculum, and document instances where communication with other students and practitioners brought about instances of self-directed learning and sharing of expertise. Some of these learning experiences emerged as designerly talk through our investigation of extended comment threads in these Facebook groups. We present the conventions of the discourse and four types of design learning embodied in specific examples, noting implications for design pedagogy and the recognition of a student-generated hidden curriculum.

Introduction

Despite decades of research in higher education surrounding the creation and sustainment of pedagogical practices, we know surprisingly little about how the student experiences learning outside formal instruction, particularly in design education (Gray, 2013; Willenbrock, 1991). The literature has relatively little to say about how students communicate informally in physical studio spaces in design education (see Dannels & Martin, 2008; Joel, 2011 as rare examples), and even less is known about how students interact with each other in productive ways in digital environments. In this study, we address the case of a student-created community on Facebook (FB) that supports students in a residential Human-Computer Interaction design (HCI/d) Master's program. In this community, students have created a network of groups to interact around the formal curriculum, supporting their coursework, and linking them to alumni from the program that are now practicing in the field of interaction design. We will address the emergence of *designerly talk* among participants, and how this talk supported the formal instruction and the future movement of students into practitioner roles.

Review of Literature

We take a critical pedagogy perspective on the computer-mediated communication (CMC) that occurred among students and alumni of this design Master's program, all of which took place outside formal instruction. We discuss the role of student communication in design education, and the role of critical pedagogy and non-traditional perspectives on design education (Crysler, 1995; Dutton, 1991; Gray, 2013). Additionally, we introduce the notion of *designerly talk* —discourse where students begin to project themselves as part of the larger practice community, employing characteristics of design thinking, reflective practice, and interaction in professional ways with their peers. A challenge we face in a review of literature for this study is that the literature generally focuses on formal instruction, and the interactions we study here took place outside of the formal instruction in which they were engaged.

Design Education

Design education centres around the studio—generally a physical space that allows for communication, display of work, critique, and other formal pedagogy (Hetland, Winner, Veenema, & Sheridan, 2007; Shaffer, 2003; Schön, 1985; Shulman, 2005). Since the early 1990s, virtual design studios (VDS) have also been explored, either as a replacement for a physical studio, or as a way to extend the formal studio space into the digital realm (Gross & Do, 1999; Kvan, 2001; Maher & Simoff, 2000). These spaces have been used primarily as a vehicle to extend the formal pedagogy, but can also facilitate some level of communication around critique (Conanan & Pinkard, 2001), display of student work (Blevis, Kim, Stolterman, & Makice, 2008), or other functions.

The studio is a manifestation of the formal pedagogy, but it is not deterministic of the kind of learning that *will* take place (Crysler, 1995), as design learning is often highly social, and can be affected by people and experiences outside of student/professor interactions (Webster, 2008). Understanding the student experience, as well as the ways in which students shape their own learning environment, is crucial to establishing a holistic understanding of the educational environment in which students live and work. A limited amount of work of this character has taken place within research on design education (Gray, 2013; Willenbrock, 1991), but taking on a critical pedagogy perspective allows us to look beyond the formal pedagogical structures to how they are perceived and used by students. Critical pedagogy is perspective on education that emerged in the work of Freire (1970/2000) in the 1970s, and is critical of traditional educational structures that assume students are empty vessels, and need to be "filled" by the professor. Another helpful construct that emerges from this perspective is the *hidden curriculum*—the implicit norms, values, and educational structures that are implicitly transferred to students in the learning experience (Dutton, 1991; Freire, 1970/2000).

Based on previous studies in this design program (Gray, in press; Gray, 2013a), the authors have discovered a number of student-created mechanisms for communication that guide their experience in the program, alongside the formal instruction. One of these structures—a network of Facebook groups created by students, and later extended to alumni of the design program—was frequently referred to as a place where information sharing, critique, and other processes that supported the formal learning environment were enacted. To more fully understand the holistic experience of students in this program, we set out to understand what kinds of communication were happening in this online space, and how this space might inform the hidden curriculum that was passed from student-to-student, rather than from professor-to-student.

Analyses of CMC in Learning Contexts

Researchers of CMC have long held the notion that analyses of learner contributions are more reliable accounts of what learners are learning than self-reports (Herring, 2001; Howard, 2010). Around this idea has grown a large number of studies that interrogate learner contributions to computer-mediated discourse (Henri, 1992; Pena-Schaff & Nichols, 2004; Marra, 2006), and to a lesser extent, the sequences of those contributions (deSiqueira & Herring, 2009, Howard, 2012a; Jeong, 2004 ,Wise et al., 2012). While these studies have generally concentrated on participation

in formal curricula, they do come to a consensus on three factors that dramatically impact learning in online discussions in general: a) power dynamics among participants, b) the design of the online space, and c) the topics or content addressed. The combination of power dynamics, media design, and topics discussed is termed "the socio-technical context" (Bijker, 1991) and reporting these is necessary for a reader to critically evaluate research of online discussions (Herring, 2007). What the literature of CMC in education lacks is studies of the power dynamics among peers in informal learning, although Paulus (2009) did find evidence that social interactions can create a sense of community and forward larger educational goals within formal curricula.

The FB groups we study here provide insights into how learners can use these spaces, and what can happen when they do. The role online communities play in forming and maintaining communities of practice has been researched in commercial spheres that use email list-servs and linear discussion forums (Hara, 2009), but social network sites (SNS, as defined by boyd & Ellison, 2007) are far more multifaceted and less investigated, especially when it comes to use in the practice of teaching and learning. These SNS include affordances that may make their usage far more relevant to those learning design. Linked documents, video sharing, and image sharing are affordances of SNS that list-servs and linear forums lack. Therefore, SNS participation may in fact be more pivotal in the creation of a community of practice for design learners than previous research on other forms of online sharing might suggest.

Designerly Talk

We searched the corpus of CMC in this study for evidence of externalised design thinking (Cross, 1982; Nelson & Stolterman, 2012; Schön, 1983). In the context of CMC, we have come to a descriptor of *designerly talk* to express the interactive nature of these communications. None of the communication was borne out of think-out-loud protocols or interviews; rather, these communications are real exchanges in the process of learning. We see the term *designerly talk* as describing communications that embody a critical character, express design judgment in a tacit or explicit way, and occur within a real community of practice around design.

Purpose of Research

A theme of recent research in design learning has been the importance in understanding the holistic learner experience—this theme comes from both instructional design (e.g., Parrish, 2009) and critical pedagogy (Dutton, 1991; Webster, 2008), as well as historically from pragmatist philosophy (e.g., Dewey, 1934/2005). We recognise that virtual spaces in which students interact as part of a holistic learner experience are integral to overall learning outcomes. Without understanding these informal spaces, we can only conjecture about their impact on the total learning experience. Inquiry into the communications that can occur in informal spaces adjacent to the formal curriculum enhances our understanding of the total learner experience and thus deepens our understanding of design learning.

In this study, we describe how a set of informal social spaces—five FB groups—functioned as part of the overall pedagogy of an interaction design Master's program. We then provide evidence of ways in which students may learn in these spaces apart from the formal curriculum.

Method

This study draws on naturalistic observation of communication among students (and a few alumni) in an existing set of FB groups created to support a Master's program in interaction design. We use a combination of qualitative and quantitative methods to understand the sociotechnical context of communication, the type of information being communicated, and the expression of designerly talk alongside the formal pedagogy of this interaction design program.

Data Collection

These student-created FB groups have existed since October 2010, according to the timestamps of the earliest posts in the original group. Originally begun as one group for a cohort of students in the HCI/d Master's program, they have since grown to three cohort-based groups (for the 2012,

2013, and 2014 Master's cohorts), a "current years" group for all currently enrolled students, and an "all years" group, containing both current students and alumni. In total, five groups where individuals generally hold membership in three, but often more than three.

After receiving access to study these groups through the institutional review board, all status updates, comments, and associated data were downloaded through the FB API using a custom PHP script. This data was stored in a MySQL database for future access in a set of relational tables, allowing for reconstruction of threads and other forms of analysis. The data was downloaded from all groups on April 26th, 2013. This corpus included: 4,558 status updates or "threads", 15,273 comments, and 5,494 "likes" on posts or comments since the creation of the first group in October 2010.

Results

The Socio-technical Context

The socio-technical context impacts the types of communications that take place in any given online space (Bijker, 1991; Herring, 2007). The power dynamic was generally peer to peer, with the occasional participation of advanced students in the PhD program, alumni, and academics who teach in the program. The set of FB groups used for this study were created and managed entirely by the student population of a top-tier Master's program in Human Computer Interaction design (HCI/d) at a large Midwestern US university. The HCI/d Master's program is a two-year residential degree, and incoming students are organised into cohorts. The initial FB group was created by a Master's student to simplify communication within his cohort. As this cohort group developed, groups that spanned additional communities also became necessary, and so students decided to create the "all years" and "current years" groups in May 2011 and September 2011, respectively. Over time, other cohorts began to create their own group using a similar structure, and creating the new group for the incoming cohort has become a tradition among students. Students from the current cohort set up the new group, recruit students who have been accepted into the program, and start the process for that new cohort to build their own community. This happens just weeks after students are accepted, and months before they will meet face-to-face. Across all five groups included in this study, 183 participants—comprising Master's students, PhD students, academics, and alumni—participated in conversations.

The content of communications clearly played a role in how the media was used. When students post status updates, they generally pick the group that is most appropriate for the audience they are talking to (Gray & Howard, 2013). Learners' reasoning for group selection may be based on whether or not the topic has something to do with their cohort, is a request to current students, or is a request for advice from advanced students or practitioners. Academics who teach in the program are present in all three types of groups, but do not actively participate, lead discussion, or post status updates, although they do on rare occasion respond to posts that interest them. Topic choice in relation to the subsequent discussion became a focus of our investigation and lead to the creation of a purposive sample.

In terms of the technical limitations of these communications (media design), status updates— the initial communication that starts each thread and subsequent comments— are essentially unlimited (60000 characters) in possible length. Group norms are more deterministic of the types of communication that appears in these spaces. Status updates averaged 31.14 words (sd: 48.05) in length, and words were an average of 3.95 (sd: 1.17) characters in length. The cases we selected were not identical to the communication as a whole, and we did not expect all communications to manifest designerly talk. Table 1 contrasts the cases we selected against the entire data set.

Table 1
A comparison of comments in terms of raw descriptors across three sets

	Corpus (n=15273)	Corpus of 15+ Comments (n=168)	Exemplar Corpus (n=50)
Average comments per thread (SD)	3.44 (5.42)	22.96 (10.37)	25.32 (9.70)
Average number of interlocutors (SD)	2.23 (2.79)	10.17 (4.75)	12.22 (6.07)
Average number of words (SD)	19.35 (30.51)	22.83 (37.00)	29.95 (50.27)
Average thread length in words (SD)	64.83 (165.71)	501.64 (560.09)	737.98 (802.83)
Average number of characters per word across the corpus (SD)	3.65 (1.26)	3.76 (1.09)	3.69 (1.85)

Thread starters, or "status updates" as termed on FB, were of particular interest because they could impact the resulting discussion. Out of 168 threads with 15 or more comments that were selected for deeper analysis, some used multimedia or links to start the conversation in the status update (*n*=19, 11%).

Group conventions lead to status updates being longer than comments, and also more complex as suggested by average word lengths. The threads which resulted in the most participation were more likely to begin with text and contained fewer links than threads which did not develop into extensive exchanges. Similarly, the comment sections of the longer threads were more complex as evidenced by word length and higher average word counts.

Creating the Purposive Sample

To identify representative threads of the types of communication that produced designerly talk in this community, we first surveyed the entire data set, coded into types of communication, then selected threads representative of the types of sharing that occurred. To do this we applied criteria, the first of which was a minimum length of 15 comments. Our reasoning was that longer threads generally included a greater number of interlocutors and more substantive communication, making our analysis more grounded in evidence and contextualised examples. 168 threads satisfied this criterion.

Once the 168 threads had been selected, they were displayed using a custom PHP script to reconstruct the original conversation from the database. A researcher read through each thread, identifying the major themes using a preliminary thematic analysis through application of open codes. These codes were applied in a non-exclusive manner, and were recorded in a parallel database table, allowing for additional analysis without altering the original dataset. 18 codes were used in this initial coding exercise, with an average of 2.38 codes (SD = 0.95) applied to each thread.

Once these open codes were assigned to all threads in the 15+ corpus (n=168), we read through all threads a second time, selecting exemplar threads based on the range of codes that had been created during the preliminary coding process. 50 exemplar threads were selected, with an awareness that these threads may have a structural composition similar to but not identical to that of the entire corpus (see Table 1).

To facilitate the identification of types of designerly talk present in the informal communication, these exemplar threads (*n*=50) were then sorted a second time using an open coding system based on the preliminary set of open codes. We then identified 11 types of designerly talk and applied one code exclusively to each of the 50 remaining threads. Four threads were selected for additional discussion because they exemplified manifest designerly talk or the coordination of discussions

about design. The threads we discuss in detail contained characteristics typical of a number of different threads in the largest corpus, such as starting a discussion by inserting a video into the status update, as we address in the fourth case, *Being an Ethical Designer*.

Analysis

Initial Coding

During the initial coding process, the 168 threads that contained 15 or more comments were evaluated and assigned one or more codes as themes arose in the data. These codes were applied to both the holistic conversation in the thread, as well as defined subsections of conversation. An average of 2.38 codes were applied to each thread, with a minimum of one code and a maximum of five codes (Table 2).

The codes spanned a wide range of topics along the trajectory of the academic year—from orientation and introductions, to the development of projects and assistance with coursework, to traditions that have developed within the department (e.g., camping trip, spring social). In addition to these chronologically-bound events, there were also themes that occurred as a regular part of the group, as a group of students began to work towards becoming professional designers. Themes such as requests for advice or critique, use of exemplars to discuss issues, issues around preparing for (or working in) professional practice reflected this shift in student capability and interest over time. The largest theme by far— social/networking—also reflected this trend, with the students' willingness and interest in socialising binding together both their professional activities, their design work, and their desire for entertainment and community-building.

Table 2
Initial open coding scheme applied non-exclusively to threads (n=168)

Code	Frequency
definition of HCI	3
group logistics	3
upskilling	3
traditions	3
studio	4
research	4
introductions	6
international	7
transportation	12
orientation	14
tools	14
project	23
exemplars	29
entertainment	33
coursework	35
advice/critique	46
professional practice	49
social/networking	114

Secondary Coding

Based on the initial open coding, exemplar threads (*n*=50) were selected from the 15+ corpus (*n*=168). This set of exemplar threads was consistent with the code application of the larger set, with only the transportation and international themes not represented. These removed threads were largely orientation-related, dealing with locating places to eat or shop. The resulting set of threads was categorised a second time, using the original codes as a reference. The second thematic analysis resulted in 11 new codes, which were applied exclusively (Table 3).

Table 3

Secondary open coding scheme applied exclusively to threads (n=50)

Code	Frequency
advice or request for critique	6
definition of terms or concepts	4
group logistics/communication	5
sharing course materials	4
coursework advice	3
practitioner advice	11
tools to use or not use	3
collaborative projects	4
conferences/professional networking	2
teambuilding/reflection	8

These codes reflected a similar breadth of subject matter as the initial coding scheme, but reflected finer distinctions between types of conversation. Professional activities were split between practitioner advice and interest in conferences or professional networking. The teambuilding and reflection theme also reflects a community-building element of the threads that was not captured effectively in the initial coding scheme.

Discussion

From the final set, we selected four cases to discuss in additional detail because they exemplify the ways in which designerly talk can manifest in the SNS (social networking) space. We outline the context of conversation, the characteristics of the discourse, and ways designerly talk manifested itself in each of these four threads.

Selecting Professional Tools

This thread represents a larger theme of solicitations by students or practitioners, requesting input on selecting a tool for professional use. While these tools can be represented quite broadly—from methods for design to software to physical tools—this specific thread focuses on the selection of a digital single lens reflex (DSLR) camera (Figure 1). As mentioned previously, cohort groups are commonly formed well in advance of the students actually beginning the program. This thread is an excellent exemplar of this engagement, where we see an incoming first year student requesting advice on which camera to buy for the program in April 2012, even though he would not begin classes until August of that year.

Figure 1. Screenshot of a portion of the thread, posted in the 2014 Cohort group on April 25, 2012

There is an underlying tension in the responses that result, primarily from the student's incoming cohort, but also from current students in the program. This tension can be seen more broadly, but emerges as it relates to picking a DSLR: should one pick a tool based on the use in the academic program, or based on the professional use of that tool as a designer (both in the program and beyond)? The original thread asks a simple question, and seven other students respond with nine distinct exemplars for him to consider. But the discussion moves beyond mere presentation of camera choices that might be appropriate. The discussion grows organically to include pros and cons of each choice, often providing a URL to a page with more details on that camera model, and, in several cases, even providing links to photos that have been taken by the student with the specific camera being referenced. In this act, they are sharing products of their own creativity using these tools, while also highlighting the merits of each device. This exchange is designerly talk manifest within the FB group.

In parallel with the presentation of camera exemplars, the division between selecting tools for a program or selecting them as a quasi-professional develops further. A second year student who is arguing for the former view only considers the program needs as a valid consideration offered that:

A dslr [digital single-lens reflex] *is not a requirement for our program, and most students who go through it do not have one. When we use images in our program, it is about meaning making. A dslr won't help with that, that is all up to the person taking the photograph.*

Comment #6/15, April 25, 2012

In contrast to this view, other incoming students advocate for a broader view of taking photographs, with one stating:
A camera is good for when you do user research and for documenting your design processes in general. It's good to take lots of pictures :)

Throughout this discussion, designerly talk emerges. Normative statements are made about the role of cameras in the design process, generalisations are made about how this tool might be used in the classroom, and distinctions are drawn between learning that is carried out solely for degree completion and learning as an ongoing act to achieve success as a practitioner. In reading these statements, it is important to remember that these exchanges are taking place among students from different years in the program, a majority of them not having formally begun coursework.

This informal space allows the students to share a level of individual expertise that may not be possible in a traditional classroom setting. One incoming student, who later emerges as a well-studied photographer, offers clarification to a second-year student's remarks about a camera, pointing out: [the camera you mentioned is] *different from a DSLR, for it doesn't have a mirror or pentaprism*. Another student references a course they took as an undergraduate at the same university, discussing how photography can be used more broadly to discuss *content, framing and story boarding*. These students are developing their discourses around tools in design, a skill they will need as students and emerging design professionals.

Without this informal space, these moments of quasi-professional information exchange may not take place to the same degree. Students accepted into a top-tier program such as this one may bring an enormous amount of motivation to the program, and based on this example, seem ready and willing to express this motivation before they enter formal study. This thread shows the potential of these interactions in driving a larger curriculum, certainly becoming part of the hidden curriculum outside the formal classroom or studio, and the extent to which they should be recognised by design educators who hope to create spaces that foster this type of learning.

Selecting a Professional Domain Name

In this case, a student poses a question to his cohort's FB group requesting advice about which domain suffix to use for his professional portfolio - with arguments made for the efficacy of ".me" or ".info." We selected this thread, part of the "practitioner advice" theme, because it was typical of this type of interaction, generally involving a student or alumnus of the program asking for advice about something related to their professional activities.

Figure 2. Screenshot of a portion of the thread, posted in the 2014 Cohort group on November 22, 2012

The original poster was the most active in this conversation, and while there were 10 interlocutors in this thread, five of them posted only once (Figure 2). The conversation lasted for 21 comments, but the final nine comments trailed off into a more social discussion about meeting up for drinks to continue the conversation in person. The original poster was a first semester Master's student, and this conversation included primarily Master's students but also two PhD students. Prior to the resolution of the original poster's question in comment #12, he received seven suggestions or points of analysis from six different students, all in less than three hours. The temporal aspect alone is impressive for learning outside of coursework. However, this conversation took place in a cohort FB group with approximately 90 members, predominantly students, but with membership by some faculty, PhD students, and other cohorts of Master's students. Approximately 10% of the cohort participated in a learning moment completely outside of coursework in the program.

The link between the initial discussion around the question he posted grew into a broader discussion of the role of search engine optimisation and networking, with one more advanced student advocating that "*URLs are [...] a 90s concept*" and that the original poster should focus more on "*search, connections, and social context.*" The bridge between the formal and social conversation was social and professional, with the original poster inviting one of the students: "*Let's talk about it at ...* [a local restaurant] *some time soon. I'll buy you a scotch.*" The topic mentioned was quite important for professionals, but did not have immediate importance for students.

Setting up a portfolio site and seeking feedback is designerly talk. It is an important step for a design professional as they search for jobs, but the student cohort in question was just coming to the end of their first semester of education in a two year program. The original topic that was posted presupposed that students have the ability and motivation to establish a web presence for themselves as practicing designers. Presumably, the original question about which domain suffix to use was prompted by a student-run recruiting event traditionally held in February, but this thread occurred in November of the preceding year.

"Mad Skillz Club"

Sharing expertise and skill sets was a recurrent theme on the FB groups. This specific case follows the general format of sharing expertise, but in a more meta-organisational, quasi-formalised way. The conversation links the virtual groups and physical studio space via the organisation of a *Mad Skillz Club* that has a tradition in the program as a student-run club in which students share their expertise with each other. The name has remained, and this thread (in Figure 3) was an attempt to resurrect this tradition and begin regular meetings in the studio once again.

Figure 3. Screenshot of a portion of the thread, posted in the 2014 Cohort group on February 14, 2013

This request had appeared in a different form during the first semester in this same group, but while the original thread was framed in organisational terms ("how can we do this?"), this thread was more pragmatically centred ("I'm going to start hanging out in the studio Mondays 5-7pm..."). The original request is quite long compared to most status updates at 134 versus 31 words across the corpus, and ends in a direct question, soliciting responses from this student's cohort (Figure 3).

Initial responses were from other students, each describing what kinds of skills they would like to learn or share in this venue. A second-year student then replies, and the original poster comments again, realising that he meant to post this in the "Current Years" group, and instead, posted it in the group for his cohort. The second-year student notes that this isn't a problem: "*Eh we are all in the same clubs anyway.*" Two students then return to the strategy used in the failed post from the Fall semester, calling for additional structure and assigned topics for each week. The original poster replies, dismissing this direction in a polite manner, noting: "*Frankly, I'm of the mind that level of organisation is what has made Mad Skills* [sic] *so hard to sustain. For this first go around I think it might be better to keep it open and see how it goes.*"

At various points in the conversation, a second-year student and a PhD student interject, but their position is not one of power, but rather in support of the general direction proposed by the original poster, confirming the past structure of the group. The conversation is collegial, demonstrating

how this space can result in supportive sharing and self-directed learning. There is no strong dialectic, as there is in some other threads; students expressed agreement with the concept, and differed only slightly in implementation. After this thread, several additional threads demonstrate that this event did take place, and students met five to six times during the remainder of the semester.

In contrast with some of the other threads we present, this thread can hardly be called a "discussion." The conversation was primarily a logistical coordination of a student organisation via the FB group, and was not primarily a venue for deliberation or debate. The conversation was critical only in the coordination of the group activities, and in determining a strategy for supportive sharing which might be most universally beneficial. This set of exchanges holds value not as a true exemplar of manifested designerly talk, but as the coordination required to manifest design learning in another context.

Being an Ethical Designer
In this case, a student posted a video of an artefact[1] that was built promote anti-smoking efforts in India (Figure 4). This video was posted without explanatory text, and was shared with the "all years" group comprised of current Master's and PhD students, faculty, and alumni of the program. The video was likely posted here because the original poster felt the topic was relevant or interesting to a broader audience of designers, not just students in his cohort.

---

[1] http://www.youtube.com/watch?v=sqH_hqzdZqs

Figure 4. Screenshot of a portion of the thread, showing the original video status post. This status update was posted in the "All Years" group on January 10, 2013.

We selected this thread because it is typical of a group of posts that bring forth core issues in the field, either intentionally, or as a by-product of conversation. Numerous threads include the posting of designed artefacts, but this status update is somewhat unique in that it contains no supporting text. This thread activated sharing of personal perspectives and experiences around the posted artefact, allowing students and practitioners to have an extended conversation around what it means to be an ethical designer. The resulting thread was somewhat longer and more complex than other threads from the "definition of terms and concepts" theme, but this thread was also the most active (at 27 comments) and most complex (an average of 60.11 words per comment) of those we chose as exemplars. This conversation among Master's students, PhD students, and practitioners, reiterates a common theme of ethical design and responsibility from the curriculum, but would have been difficult to recreate in a traditional classroom environment given the number of participants and their ability to craft their contributions asynchronously.

The thread begins with two posts lauding the anti-smoking design described in the video. The design incorporated a chant used for mourning the dead in India into a public lighter often found in shops, connecting death with cigarette lighting to discourage smoking. After a one day lapse in the conversation, three posts quickly followed questioning the ethics of the design that was originally presented, taking the position that people are responsible for their own agency and decisions. In comment #9, one of the students shifts the conversation slightly, reframing the discussion in design terms, linking their classroom instruction in interaction design to the ethical conversation, referring to the people affected by this design as "users." This marked one of the first points in the conversation where the formal pedagogy and the artefact conversation align, embedding the discussion of ethics directly into the role of the designer - the future or actual role of the participants in this thread. The participants use a variety of strategies to grapple with the concept of user agency, making generalisations and hypotheses in a variety of contexts to strengthen their arguments. A second year Master's student then enters the conversation, referencing more general concepts of agency outside of design, citing relevant literature in philosophy, and referencing a project all students in this program complete in their first semester (a behavioural prototype around the use of thermostats) as a boundary object to link the discussion to a shared experience that is relatable, attempting to draw the conversation away from the more hypothetical and generalisation direction.

The conversation is then redirected again by a PhD student and practitioner with more experience and higher-level discourse skills in the field. The discussion between these two individuals continues for three extended comments, including more nuanced perspectives from practice, until a first year Master's student returns the conversation to the previous, more accessible level. The thread concludes with a series of posts by another Master's student with a background in philosophy; he uses this thread to signal to others that this is an area where he has expertise.

The thread lasts a total of five days, including periods of high activity and days where no posts are made at all. The application of an instance of design to the formal pedagogy facilitates students' discussion of deep and intricate concepts in design without the guidance of academics. Students put forward positions and engage in rich conversation with peers, doctoral students, and practitioners. This discussion exemplifies instances where students develop designerly talk in a context where academics are unlikely to participate.

Implications for Future Research

Regardless of educators' positions on using social media within the formal pedagogy, the holistic student experience will include time spent in these spaces. Educators cannot expect to understand the full experience of learning without understanding the learning that takes place, and does not take place, on social media. This particular media—Facebook (FB)—may pass out of use, but it is unlikely that mediated communication of this kind ever will. Wiser educators will consider it among the pedagogical tools at their disposal, and the potential of social media of all kinds should be understood to be used most adeptly.

The evidence presented in this study also implies that design educators and researchers of design pedagogy must re-assess just how much learning communities can accomplish on their own. Along these lines is an implication that the role of the teacher is changing. We must ask ourselves just what role the teacher of design should take given the speed of technological change and our learners' access to each others' thoughts and ideas. The learning in these FB groups came about without the oversight of professors or the leadership of a body of educators. Learners can learn as independent groups, but what *should* they learn as independent groups and what *should* they experience as instruction? We must find ways to separate the knowledge that is best gained through learning communities from the knowledge that is unlikely to be accessible there. Surely unguided learning in social networks sites is not always accurate learning. Future research that finds ways to pick apart instances of misconception, and topics where unguided learning is a dangerous path may hold a transformative utility for the field of design pedagogy.

A final implication is that some learners will not be served if such mediated social networks or like approaches are not implemented in their institutions, yet this is tempered by the student-generated nature of this specific community. We know that some learners are more vocal in CMC situations (Howard, 2012b), but how can instructional designs legitimate this kind of communication without destroying its autonomy and freedom? We are forced to ask if a SNS community of learners is a necessary component of modern design curricula. Are we failing those learners if we do not provide for, and legitimate, SNS participation that evidences learning? It is clear from the analysis of this space that a space constructed by an academic within the context of a course or academic program may have substantially different patterns of use than that created by the students without an explicit academic mandate.

Conclusion

Not all student populations may have the willingness or innate capability to use a social network in this quasi-professional way, but we offer these cases as evidence that it can, and does, happen under certain conditions. The social network discussed here supported a type of professional development that was vital to the success of the overall program, and potentially the recruitment of students into professional positions. While conversations such as these are likely out of the view of those who create the formal curriculum, these kinds of conversations are nonetheless part of what living and learning in this program actually entails. These conversations exemplified a hidden curricula within a design program where numerous opportunities to interact with other students in a quasi-professional way supported learning.

The first and fourth examples offered in this paper, namely, *Selecting Professional Tools* and *Being an Ethical Designer* threads, revealed opportunities for designerly talk that broke the confines of space and time. The *Selecting Professional Tools* thread addressed temporal bounds through evidence of design learning prior to the start of the formal curriculum, and in doing so, suggest that perhaps design education for the 21st century should reach beyond simply who is enrolled in a course. These learners, both enrolled and not yet enrolled, grappled with a persistent design education question: should one pick a tool based on the use in the academic program, or based on the professional use of that tool as a designer? Their discussion suggests we can expand who is involved in learning. This evidence calls into question *enrolment* as the singular claim to access to learning. This example presents a kind of teaching that perhaps could not have been envisioned without the SNS tool (FB).

The *Being an Ethical Designer* discussion around the anti-smoking lighter design in India presents a case where designerly talk around the ethics of a design is similarly unbounded. The FB groups provided learners the opportunity to craft contributions and try out their designerly talk on other designers outside of the pressures of speaking up in class. This is a context we could not hope to craft in a face-to-face environment. Learners in a classroom setting are always pressed to create their contributions on the spot, and insightful contributions from others cannot be re-experienced or studied. The contributions from advanced students and professionals provided unmatched learning opportunities for those willing to consume the full discussion.

Two of the four threads we discussed in detail made clear connections between design learning and design practice. *Selecting Professional Tools* suggests we may be able to design for learning that is beyond the context of the teacher-learner relationship in new ways. The learners' discussion about tool selection is more akin to workplace design discourse than it is to teacher-student talk. This SNS discussion forced the learners to think maturely about design, beyond the program and into the real world of practice. This type of interaction in the SNS may suggest new avenues to access the learning we traditionally relegate to internship learning or apprentice-style instruction. Similarly, *Selecting a Professional Domain Name* evidenced a bridge between learning and practice as part of the experience of the FB groups. An out-of-class activity that engages 10% of a cohort in designerly talk surely suggests a desirable feature for pedagogy. While these data do not suggest ways to make this happen, they do suggest that this kind of learning can take place outside of formal instruction.

The third case, *Mad Skillz Club*, exemplifies learning that we hope to support in pedagogy but often find extremely difficult to accomplish. The learner driven and organised learning, as evidenced in FB comments, resulted in actual face-to-face learning comprising five or six student-led learning sessions in a single semester. We surely do not want to imply a causal relationship between the student-led sessions and FB, but what we cannot deny is that the convenience of the tool played a role in facilitating that activity.

Designers of instruction must understand how informal pathways of communication might support or hinder learning. In this study, we focused only on the supportive role, revealing four different ways designerly talk manifested in a SNS. These examples suggest that informal and formal patterns of communication interact in the generation of a learning experience. We found evidence that certain kinds of learning may be more easily imparted via designerly talk with peers and practitioner/alumni than might have been possible in formal instruction. As design programs adopt complex hybrid and virtual components, it is critical that researchers deepen their understandings about the construction and sustainment of online communities—particularly communities that were not formally designed as part of the curriculum, but support the development of learning and professionalism in tangible ways.

References

Bijker, W. E. (2001). Social construction of technology. In N. J. Smelser & P. B. Baltes (Eds.), *International Encyclopedia of the Social & Behavioral Sciences* (Vol. 23, pp. 15522–15527). Oxford, UK: Elsevier Science.

boyd, d. m., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), Article 11. Retrieved from http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html

Blevis, E., Lim, Y. K., Stolterman, E., & Makice, K. (2008). The iterative design of a virtual design studio. *Techtrends: A Journal of the Association for Educational Communications and Technology, 52*(1), 74-83.

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).

Cross, N. (1982). Designerly ways of knowing. *Design Studies, 3*(4), 221-227.

Crysler, C. G. (1995). Critical pedagogy and architectural education. *Journal of Architectural Education, 48*(4), 208-217.

Dewey, John. (1934/2005). *Art as experience*. New York: Perigee Trade.

de Siqueira, A., & Herring, S. C. (2009). Temporal patterns in student-advisor instant messaging exchanges: Individual variation and accommodation. Proceedings of the 42nd Hawai'i International Conference on System Sciences (HICSS-42), Los Alamitos, CA: IEEE Press.

Dutton, T. A. (1991). The hidden curriculum and the design studio: Toward a critical studio pedagogy. In T. A. Dutton (Ed.), *Voices in architectural education: Cultural politics and pedagogy* (pp. 165-194). New York: Bergin & Garvey.

Freire, P. (1970/2000). *Pedagogy of the oppressed*. New York: Continuum.

Garrison, D. R. (1992). Critical thinking and self-directed learning in adult education: An analysis of responsibility and control issues. *Adult Education Quarterly, 42*(3), 136-148.

Gray, C. M. (2013). Personal and pedagogical factors that shape design thinking. *Design and Technology Education, 18*(3), 8-20.

Gray, C. M. (in press). Informal peer critique and the negotiation of habitus in a design studio. Art, *Design and Communication in Higher Education*.

Gray, C. M. & Howard, C. D. (2013, November). *Expectations of reciprocity? An analysis of critique in Facebook posts by student designers*. Paper presented at the Critique 2013 Conference Proceedings. Adelaide, South Australia.

Gross, M., & Do, E. (1999). *Integrating digital media in design studio: Six paradigms*. Paper presented at the American College Schools of Architecture Conference, Minneapolis, MN.

Hara, N. (2009). *Communities of practice: Fostering peer-to-peer learning and informal knowledge sharing in the work place*. Berlin: Springer-Verlag.

Henri, F. (1992). Computer conferencing and content analysis. In A. R. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden Papers* (pp. 115-136). New York: Springer.

Herring, S. C. (2001). Computer-mediated discourse. In D. T. D. Schiffrin & H. Hamilton (Eds.), *The handbook of discourse analysis* (pp. 612-634). Oxford: Blackwell.

Herring, S. C. (2007). A faceted classification scheme for computer-mediated discourse. *Language@Internet, 4*, Article 1. Retrieved from http://www.languageatinternet.org/articles/2007/761

Hetland, L., Winner, E., Veenema, S., & Sheridan, K. (2007). *Studio thinking: The real benefits of visual arts education*. New York: Teachers College Press.

Holt, J. E. (1997). The designer's judgement. *Design Studies, 18*(1), 113-123.

Howard, C. D. (2012a). *Higher order thinking in collaborative video annotations: Investigating discourse modeling and the staggering of participation*. Doctoral Dissertation, Indiana University Bloomington.

Howard, C. D. (2012b). An instructional paradigm for the teaching of computer-mediated communication. *Instructional Science 40*(3) 493-513. doi: 10.1007/s11251-011-9187-0

Howard, C. D., Barrett, A. F. & Frick, T. W. (2010). Anonymity to promote peer feedback: Pre-service teachers' comments in asynchronous computer-mediated communication. *The Journal of Educational Computing Research, 43*(1), 89-112.

Jeong, A. (2004). The combined effects of response time and message content on growth patterns of discussion threads in computer-supported collaborative argumentation. *Journal of Distance Education, 19*(1), 36-53.

Kvan, T. (2001). The pedagogy of virtual design studios. *Automation in Construction, 10*(3), 345-353.

Maher, M. L., & Simoff, S. (2000). *Collaboratively designing within the design*. Paper presented at the Co-Designing 2000 Conference.

Marra, R. (2006). A review of research methods for assessing content of computer-mediated discussion forums. *Journal of Interactive Learning Research, 17*(3), 243-267.

Nelson, H. G., & Stolterman, E. (2012). *The design way: Intentional change in an unpredictable world* (2nd ed.). Cambridge, MA: MIT Press.

Parrish, P. E. (2009). Aesthetic principles for instructional design. *Educational Technology Research and Development, 57*(4), 511-528. doi:10.1007/s11423-007-9060-7

Paulus, T. M. (2009). Online but off-topic: Negotiating common ground in small learning groups. *Instructional Science, 37*, 227-245.

Pena-Shaff, J., & Nichols, C. (2004). Analyzing student interactions and meaning construction in computer bulletin board discussion. *Computers and Education, 42*, 243-265.

Polyani, M. (1966). *The tacit dimension*. Garden City, NY: Anchor Books.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.

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

Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.

Shaffer, D. W. (2003). *Portrait of the Oxford design studio: An ethnography of design pedagogy*. WCER Working Paper No. 2003-11. Madison, WI: University of Wisconsin-Madison.

Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus, 134*(3), 52-59.

Willenbrock, L. (1991). An undergraduate voice in architectural education. In T. A. Dutton (Ed.), *Voices in architectural education: Cultural politics and pedagogy* (pp. 97-119). New York: Bergin & Garvey.

Wise, A. F., Perera, N., Hsiao, Y., Speer, J., & Marbouti, F. (2012). Microanalytic case studies of individual participation patterns in an asynchronous online discussion in an undergraduate blended course. *The Internet and Higher Education, 15*(2), 108-117.
.