How, Why, and With Whom Do User Experience (UX) Practitioners Communicate? Implications for HCI Education

Craig M. MacDonald[a]*, Emma J. Rose[b], and Cynthia Putnam[c]

School of Information, Pratt Institute, New York, NY, USA; [b]School of Interdisciplinary Arts & Sciences, University of Washington Tacoma, Tacoma, WA, USA; [c]College of Computing and Digital Media, DePaul University, Chicago, IL, USA

*Corresponding author:
Mailing Address: 144 W. 14th Street, 6th Floor, New York, NY 10011
Email Address: cmacdona@pratt.edu
ORCiD: https://orcid.org/0000-0002-1508-8565

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While being a good communicator is a key skill for user experience (UX) practitioners, human-computer interaction (HCI) education typically prioritizes the creation of tangible project deliverables, e.g., wireframes, over providing students with a more complete set of communication skills. In this paper, we draw from an analysis of 60 interviews with experienced UX professionals to argue that a nuanced understanding of communication strategies should be explicitly included in HCI education. Specifically, we identify five goals that shape communications between UX practitioners and four distinct audiences and show that they select specific methods (techniques, artifacts, and tools) to achieve these goals. Drawing on theories of situated and authentic learning, we discuss three key implications for HCI educators: embracing rhetorical complexity, simulating real-world communication challenges, and highlighting the performative elements of communication. Educators must embrace these challenges to help students become more effective communicators and prepare them for UX careers.

Keywords: Communication, UX Industry, UX Practices, HCI Pedagogy

Introduction

Communication skills are a key for success in most knowledge work. This is especially true for User Experience (UX), where effective communication enables the sharing of design information, facilitates decision-making, and helps coordinate and align project activities between multi-disciplinary teams (Chiu, 2002; Dalsgaard et al., 2014; Furniss et al., 2008; Self, 2019; Turner et al., 2010). In fact, communication skills are often perceived to be as important, if not more important, than technical skills when hiring for UX roles (Rose et al., 2020). Therefore, gaining a deeper and more nuanced understanding of communication practices is essential to becoming a successful UX practitioner.

While UX has roots in many fields, Human-Computer Interaction (HCI) is viewed by many as its most closely associated academic discipline, and most HCI education programs are now explicitly oriented towards preparing students for UX careers. HCI educators usually

acknowledge that effective communication is an essential component of the User-Centered Design (UCD) process and therefore understand that communication skills are important for students to develop. However, in our experience, many educators do not know exactly what communication skills to teach or how to teach those skills effectively. As a result, HCI curricula typically do not reflect a diversity of communication practices. Instead, HCI education tends to prioritize documentation as the primary form of communication, which flattens its complexity and inhibits students' ability to develop a more complete set of communication skills.

Therefore, we set out to better understand the ecology of communicative practices of UX professionals, with an eye towards identifying meaningful insights for HCI educators. Workplace communication is varied and multi-faceted, and includes a combination of oral, written, and visual communication styles (Turner et al., 2010). For our purposes, we consider UX communication practices to encompass all the methods that practitioners use to share or disseminate information with co-workers and other stakeholders as part of their typical UX process. To learn about these practices, we conducted interviews with senior UX professionals (i.e., people with at least 5 years of UX industry experience) representing both agencies/consultancies and in-house UX teams located throughout the United States. Interviews were conducted as part of a larger research project seeking to improve HCI pedagogy and curricula to reflect trends in the UX industry. Our interview questions focused broadly on the UX practices of each participant's organization, but for this paper we focus on analyzing interview segments in which participants discuss their communication practices. This paper has two key contributions: (1) it provides insight into the nuanced communicative practices of UX practitioners across a wide variety of professional contexts, and (2) it offers guidance to HCI educators on how to help students become more effective communicators and, by extension, better prepare them for UX careers.

The paper is organized as follows. First, we explore related work that highlights the challenges of teaching communication skills, the communication complexity of UX practices, and existing educational practices in HCI. Second, we detail the methods for this study including recruitment, data collection, and analysis. Third, we share the findings from the study organized into three categories: communication goals (why UX practitioners communicate), intended audiences (who UX practitioners communicate with), and communication methods (how UX practitioners communicate). Fourth, we discuss three implications for how understanding UX communicative practices can inform teaching in HCI, namely embracing rhetorical complexity, simulating real-world communication challenges, and highlighting the performative elements of communication. We close by sharing limitations and calls for future work.

Related work

To situate our study, we summarize related work in three areas: the challenges of teaching communication skills, the complexity of communication in UX practice, and practice-focused HCI pedagogy and curriculum development.

Challenges of teaching communication skills

Teaching communication skills is an ongoing challenge for educators in many fields. First, the term communication itself is broad and can encompass a wide variety of skills and practices, including oral communication, listening, written communication, visual communication, interdisciplinary communication, and intercultural communication (Reimer, 2007). Because the concept is so broad, what constitutes good communication is nuanced and may be specific to a particular organization and social context. Therefore, what makes someone a good *communicator* is not always clear, which can lead to a disconnect between

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employers and employees. In fact, several studies have identified a gap between employer expectations for communication skills and recent graduates' assessments of their own skills (Bozic Lenard & Pintarić, 2018; Donnell et al., 2011). Specifically, both employers and students believe communication skills are important, but students often overestimate their existing skill sets, whereas employers may underestimate the complexity for a new employee who is communicating in a new context. This complexity creates a challenge for educators teaching students to be effective communicators, especially when preparing them for careers in a broad and nascent field like UX. Current HCI pedagogical practices that focus primarily on deliverables oversimplifies the role of communication in UX and prevents students from gaining a deeper understanding of the full scope of communication skills required to succeed in professional contexts.

Complexity of communication in UX practice

UX is a particularly challenging communicative space due to its relative youth as a field, its rapid proliferation, and the fact that much of the communication takes place in interdisciplinary spaces. As stated by Greever in his practitioner-focused book, *Articulating Design Decisions*, "the growth of the UX designer has changed our role in so many ways, none more so than the need to explain ourselves to other people that don't share our experience in design" (Greever, 2020, p. 9). The complexity of communication in UX is due to the wide variety of internal and external stakeholders involved in UX, or what Lougmani (2018) refers to as "communication layers." Another UX practitioner, Doug Collins, writes that a key skill in UX is to learn and speak the language of partners and clients and to translate UX specific jargon and terminology for a wider audience (D. Collins, 2017).

In addition to these perspectives from practitioners, several scholarly studies have shown that UX is a highly situated rhetorical practice that requires flexible thinking and a

persuasive kind of cunning (Rose & Tenenberg, 2016). For example, Furniss et al. (2008) found that communicating work was one of three primary elements of usability practice due to the importance of persuading developers to implement design recommendations. Similarly, Gray (2014) found that UX practitioners' presentation and persuasion skills were essential. In a later study, Gray (2016) identified getting feedback, facilitating collaboration, and persuasion as three common types of communication for UX designers. These are all examples of what Goodman (2013) labeled "performance practices" in HCI, or instances in which designers use storytelling and narrative in front of an audience of collaborators or stakeholders. In Goodman's framing, these performative acts include planned client presentations, regular team design reviews, and spontaneous debates between designers, all of which are essential parts of the interaction design process. Notably, these communication practices closely mirror those from other design disciplines, such as architecture, industrial design, and fashion design (Lauff et al., 2020; Perry & Sanderson, 1998).

However, much of the research on communication in design has focused on the use of artifacts, likely because of their tangibility and their ability to "function as mediators between different individuals or groups, in design (aka, boundary objects)" (Perry & Sanderson, 1998, p. 275). For example, Wohlrab et al. (2018) observed that artifacts were used to either coordinate teamwork or as boundary objects to support systems thinking among multi-disciplinary teams. The use of design artifacts as boundary objects is particularly relevant in HCI since designing interactive systems requires negotiation and collaboration between multi-disciplinary teams (Bertelsen, 1998; Dalsgaard et al., 2014). However, researchers have also found that static artifacts like personas, sketches, design specs, and prototypes are rarely designed to be stand-alone deliverables and typically include verbal communication for explanation and contextualization (Blomkvist et al., 2015) . Likewise, Høegh et al. (2006) found that although usability reports helped developers address usability issues, directly

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observing usability studies was more effective at generating empathy with users and providing a richer understanding of those issues.

Personas and their communicative value have drawn considerable attention from scholars. As visual representations of intended users, personas are meant to serve as a basis of communication between project stakeholders and as a medium to share important insights derived from user research (Pruitt & Grudin, 2003; Salminen et al., 2018). When used effectively, personas can prevent teams from developing elastic visions of the intended user (Rönkkö et al., 2004; Subrahmaniyan et al., 2018), make user definitions more precise (DiMicco & Mann, 2016; Rönkkö et al., 2004), remind designers of relevant and essential user information during design discussions (Dotan et al., 2009), build support for design choices (Judge et al., 2012; Rose & Tenenberg, 2016), and align teams around a shared understanding of user needs (DiMicco & Mann, 2016; Dotan et al., 2009; Nielsen & Storgaard Hansen, 2014). However, personas lose their communicative power if they are not validated with real customer data (Faily & Flechais, 2011; McGinn & Kotamraju, 2008), are not viewed as trustworthy (Blomquist & Arvola, 2002; Rönkkö et al., 2004), or aren't well understood by relevant stakeholders (Jianming et al., 2007; Putnam, Reiner, et al., 2016). As a result, design teams tend to adapt personas to fit their specific needs (Chang et al., 2008) or they may not use them at all (Friess, 2012).

Documentation plays a significant role in translating design knowledge for different audiences, but UX professionals also need to "'manage client expectations' through rounds of meetings, 'get buy-in' from stakeholders on design decisions, negotiate technical decisions with developers, then 'socialize' their deliverables by presenting them to relevant decision-makers" (Goodman et al., 2011, p. 1064). Further, they must overcome practical communication challenges, such as transmitting information precisely, preserving the intended meaning of messages, influencing the behaviors of target audiences, and ensuring

information is distributed to the right stakeholders (Chiu, 2002). Additionally, previous research has shown that all design artifacts, including personas, have flaws: they get outdated (Wohlrab et al., 2018), are time-consuming to create (Blomkvist et al., 2015), and are interpreted differently depending on one's area of expertise (Self, 2019). There is also a fundamental mismatch between agile software development practices and artifact-driven approaches to UCD (Blomkvist et al., 2015; Wohlrab et al., 2018). In other words, communication for UX professionals is much more complex than creating the right deliverable or sharing the right artifact; instead, there is a complex communication ecology in which UX professionals need to move fluidly among varied strategies to satisfy different audience needs and achieve varied goals (Turner et al., 2010).

Preparing students for UX careers

The UX industry has experienced rapid growth and change over the past 20 years. One of these changes has been an increased demand for education programs that are oriented towards preparing students for UX careers. While other academic disciplines also offer students relevant knowledge and skills, the HCI discipline is most closely associated with the UX industry. As a result, nearly all HCI courses and programs are now focused on preparing students for UX careers, which challenges HCI educators to build curricula that reflect industry trends and provide students with the expanding set of knowledge, skills, and abilities expected of new UX professionals (Rose et al., 2020). Whether working in a design agency, on an in-house team, or as an independent consultant, for a small start-up or a multinational corporation, students must be able to adapt to a multitude of contexts (Gray, 2014). In addition, design educators are facing a call for a broader discussion for how UX education should be transformed to account for the growth and maturity of UX design as a field (Meyer & Norman, 2020). The increased adoption of agile software development and other "lean"

methods has also upended traditional waterfall-based (and documentation-heavy) UCD models (Blomkvist et al., 2015). Further, some organizations have adopted hybrid 'wagile' approaches that combine aspects of waterfall (set milestones, large-scale stakeholder reviews) with features of agile (scrums, sprints), adding an additional layer of complexity for students to master (Steane et al., 2020).

Curriculum improvement efforts in the HCI community have focused primarily on the topics and methods that should be covered by education programs (Churchill et al., 2016; Getto & Beecher, 2016), which yields a growing list of "hard" or technical skills that HCI students should learn. Discourse within the professional community has also emphasized technical skills, as demonstrated by the salient discussion of the "t-shaped" UX professional (Brown, 2005; Steane et al., 2020) and efforts to define the range of technical domains that comprise the UX profession (Batagoda, 2017; Garrett, 2002). However, as demonstrated in the previous sections, there is clear evidence that UX practitioners need to be highly effective communicators. In a previous paper, we reported that UX hiring managers listed effective communication as one of the most crucial skills, including a wider variety of techniques such as communicating research insights, articulating design problems, and facilitating collaboration (Rose et al., 2020).

Some HCI education programs do include communication skills in their program-level learning outcomes (e.g., Vorvoreanu et al., 2017), and many educators are actively grappling with the challenge of how advanced rhetorical strategies can be leveraged and explored in the classroom (e.g., Rose & Tenenberg, 2017). There is also an ongoing discussion about how studio-based pedagogy may be a better model for HCI due to its emphasis on critique and articulation (Arvola & Artman, 2008; Brandt et al., 2013; Koutsabasis & Vosinakis, 2012). However, this approach is not the norm; most HCI educators still use a lecture-driven, artifact-centric approach in their classrooms (Oguamanam

et al., 2020; Wilcox et al., 2019). Ultimately, this emphasis on documentation over other forms of communication provides an inaccurate picture of what professional UX practice looks like, which reduces the "authenticity" of the learning environment (A. Collins, 1988; Potter & France, 2018) and risks leaving students underprepared for professional roles. Clearly, students would benefit from both learning how to create documentation and also how to directly attend to the nuanced communicative environments they will likely encounter as they embark on their careers. Given the current deliverable-based approach and the disconnect between student awareness and employer expectations, it is therefore important to understand communication skills in UX in more detail and provide guidance to HCI educators seeking to incorporate a richer and more nuanced set of communication skills into their courses.

Methods

This paper presents a portion of findings from a larger project seeking to better understand UX industry practices to improve HCI pedagogy. In this section, we first describe the participants we recruited and the data collection method we used for the overall project, which were previously summarized in Rose et al. (2020). Then, we discuss the data analysis approach we applied for this specific paper.

Participants

Overall, we interviewed 71 total participants across 64 interviews (three interviews involved multiple participants). We used convenience sampling and snowball methods to recruit participants, including word of mouth, messages posted to email discussion lists and Slack channels run by professional UX organizations, posts to social media including Twitter and LinkedIn, and direct messaging on LinkedIn. We sought to interview people who had several years of industry experience because we felt those individuals would be more knowledgeable

about their company's overall UX processes. To ensure they could speak to the totality of their company's UX practices, we identified people who had been in a senior role (e.g., as a director, manager, lead, or other similar title) long enough to complete at least one project. Therefore, to be eligible for inclusion participants needed to have at least five years of experience in the UX industry and at least 6 months in a senior role. In our sample, participants had an average of 13.5 years of industry experience, and an average of 3.75 years in their current job. All participants had at least a bachelor's degree. A majority of the participants (63%, n = 45) held a managerial role, while 24% (n = 17) were individual contributors (i.e., non-managers) and the remaining 13% (n = 9) were internal or external consultants. In terms of organizational context, 61% (n = 39) of our interviewees worked on in-house UX teams and 39% (n = 25) worked in agencies or acted as independent consultants.

We focused our efforts on recruiting participants who lived or worked primarily in the United States. As a result, almost all participants worked for organizations based in the U.S. at the time of the interview; a majority (95%, n = 61) were also located in the U.S., with 36% (n = 22) on the East Coast, 36% (n = 22) in the Midwest, and 28% (n = 17) on the West Coast. The remaining participants were based in Europe (n = 2) and India (n = 1).

Less than half of the participants (41%, n = 29) worked remotely at the time of the interviews either all of the time (n = 13) or some of the time (n = 16); the rest worked entirely face-to-face. While participants held a variety of job titles, the most common titles were 'Directors of' (e.g. User Experience, Design), 'Seniors of' (e.g. UX Researcher, Manager) and 'Lead of' (UX Researcher, UX Architect). Participants were split almost evenly between those who worked primarily in design (32%, n = 23), primarily in research (25%, n = 18), and a mix of both research and design (27%, n = 19). Finally, participants worked in a variety of industries, with the most common being software (n = 6), financial services (n = 5), e-

commerce (n=4), medical devices (n = 4) and healthcare (n=4). A table summarizing our participants is available in Appendix 1.

Data Collection

We completed the interviews between June 1, 2017, and April 1, 2020. Due to differences in time zones and participants' preferences, interviews were conducted in three formats: remote video (n = 42), phone (n = 9) and in-person (n = 13). The different formats had no impact on interview content, quality, or length. All interviews were recorded and transcribed; however, we had four technical failures in which three interviews did not record and one recorded only half-way; as such, in this paper we are using the sample size of 60 (instead of 64) when reporting how common a finding was among our participants.

Interviews typically lasted 60-70 minutes and participants were offered a $30 gift card as a gratuity. Interviews were semi-structured and followed the same basic protocol, which covered a variety of topics related to the participants' current UX practices. We included questions about their current position, the size of their organization, the varied UX roles at their organization and how they intersected, the research and design methods they used, whether and how they incorporated accessibility into their work, and whether their company used agile methods. We also included questions about what they looked for in new hires and how they felt the UX industry had changed over the course of their careers. Time permitting, we also asked some participants to discuss recent projects that went well and poorly.

In this paper we report only our analysis of interview segments that discussed the communication practices of our participants (and their UX colleagues). Unless participants brought up the topic themselves, we asked participants to explain their company's communication practices near the beginning of the interview as part of a broader discussion about how UX is practiced at their company, typically after describing the size and structure

of their UX team and before discussing the use of specific design and research methods. We also probed specifically for which communication artifacts and tools they or their team used if participants did not discuss them organically. These interview segments were approximately 7-8 minutes on average, although there was some variety with six participants talking for less than four minutes and 13 participants talking for 12 minutes or more. Overall our analysis is based on approximately 480 total interview minutes, or roughly 13% of the total interview data.

Data Analysis

While we considered other analysis methods (e.g., thematic analysis), we chose content analysis because its systematic approach to categorizing large sets of textual data allows for the identification and quantification of trends and patterns (Krippendorff, 1989; Mayring, 2000; Vaismoradi et al., 2013). As explained by Neuendorf (2019), a key assumption of content analysis is that the coding scheme is the research instrument rather than the researcher. Therefore, we took steps to ensure a high degree of inter-rater reliability. Our approach included three phases: creation of an a priori coding scheme, inductive coding, and inter-rater reliability.

Step 1: Creation of a priori coding scheme

Because of its emphasis on quantifying patterns, the creation of an a priori coding scheme is critical to the use of content analysis (Mayring, 2000). Using Atlas.ti, one author first structurally coded all of the transcripts to identify segments of each interview in which communication was discussed. We then selected a subset of 12 interviews (four interviews conducted by each of the three authors) and individually coded the segments from each of those 12 transcripts that were structurally coded for communication. Next, we met to review our respective codes and draft operational definitions. Through discussion, we combined our

three separate lists of codes into a unified coding scheme with three broad categories: who they were communicating with (audience), why they were communicating (goal), and how communication was facilitated (method), which was further split into artifacts, techniques, and tools.

Step 2: Inductive coding

Next, each author individually coded the remaining transcripts using our common coding scheme to guide our analysis and ensure consistency. During this process, we found that identifying methods and audience was typically a matter of systematic coding (i.e., counting instances). Despite differences in their geography, industry, and company size, there was a high level of consistency in the ways participants discussed who they communicated with and how they communicated with those audiences. This consistency allowed for a straightforward application of codes in these two categories with minimal disagreement between the three researchers. However, identifying participants' communication goals was far more nuanced and required an additional step.

Step 3: Inter-rater reliability

After completing a first round of inductive coding on all the transcripts, we met again to review our respective lists of codes from the goals category and create a common set of five codes and operational definitions. We then created a crosswalk to translate our individual codes into this new consolidated set. Because of this added step, we conducted a separate inter-rater reliability analysis. Using 10 from the original subset of 12 interviews, we sampled 57 segments of discussion about communication. We then asked three people - one of the authors and two others from outside our research team (one HCI graduate student and one UX professional) - to use this new code book of operational definitions to identify the intended goal(s) for each of the 57 interview segments. We evaluated inter-rater reliability

using Fleiss's kappa in SPSS version 26 for all five categories and segments combined (n = 57 segments x 5 categories = 285 segments).

Once the inductive coding was complete, we individually exported a transcript by code spreadsheet from Atlas.ti. If at least two of the three authors agreed that the code was present in the transcript, we included that code in our final quantitative summary of each category and report that number as an indication of commonality.

Findings

In this section, we report our findings in the three categories from our analysis: communication goals (why), intended audiences (who), and communication methods (how). Some participant quotes have been lightly edited for clarity and to remove filler words (e.g., "um" and "you know").

Communication Goals (Why)

When describing their communication practices, an overriding theme across all participants was that their choice of communication method was almost always determined by what they were trying to achieve. As P28, a senior designer on an in-house team, explained:

> "I think it depends on the problem being solved...Sometimes, an artifact such as a photo of a brainstorming session is enough to show like, 'Oh, we've done something. We've done work. We've had conversations about this particular thing. Here's an outcome of that.' We are typically of the mindset that documentation is nice, but there's so much going on, if you can't really justify a long-term need for it, we might not do it."

We identified five (often overlapping) categories describing why UX professionals communicate, listed here by how many participants mentioned the goal (see Table 1): (1) sharing research insights, often with the goals of making users more visible to other teams and stakeholders; (2) alignment, i.e. getting teams and stakeholder on the same page; (3)

direct collaboration, e.g., the use of common platforms and software for brainstorming and sharing assets; (4) persuasion and buy-in, to get other teams and stakeholders to agree with a perspective and (5) peer review and feedback, to make a design or deliverable stronger.

[Insert Table 1 here]

Fleiss' kappa for the combined five categories indicated a high-moderate agreement among the three raters, (n = 285 discussion segments), κ=.571 (95% CI, .569 to .573), p < .001; κ = 0–0.20 is considered slight, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial, and 0.81–1 is almost perfect agreement (Landis & Koch, 1977).

Sharing Research Insights

The most commonly cited communication goal participants discussed was to share research insights. We further identified two subcategories: (a) general sharing of insights and (b) for making users and users' needs more visible to other teams and stakeholders.

(a) In an example of general sharing of research insights, P57, a design ops manager, reflected on how their research team communicated insights to make them more accessible:

> "I love our research team for that ...They make brilliant presentations with all of their
> findings usually...which starts off very dry with the methodology for three pages usually,
> which I tend to skip. Um, then they have an exec summary. They have the key findings
> in a little bit more detail and they unpack it from there, kind of going into more and more
> detail. And usually at the end they have a list of our recommendations [on] what to do."

(b) Several participants also discussed how they shared research insights with the aim of making users visible to others. As a senior UX researcher, P59 reflected on finding ways to humanize their users:

> "There's a lot of videos that I share, lots of video clips and lots of talking about, 'so this
> is what this overall means, this is what this insight means.' Really focusing more on, this

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isn't necessarily all of the findings...these are the important things that you need to know and then this is the human behind the screen so that, you know, typically she, what she looks like and what she cares about and these are the sorts of things that then affects how she's interacting with this."

Alignment

We coded for the alignment category when participants discussed how they achieved a 'unified vision' among team members, other teams, and/or stakeholders. The concept of 'unified vision' included: (a) the goals/scope of the project; (b) awareness about what people/team-members were working on; (c) team building (often in context of remote workers); and (d) checking back during the project to assure that the teams' understanding was accurate.

(a) Determining the goals and project scope was typically described early in a project and was especially important to the participants who worked in agencies. For example, during an interview with a team of two people who managed a UX agency (P22), they recounted:

> "We've been kind of trying to standardize this a little bit, from the project scope, carrying that over to some type of a high-level brief that can be used both for the internal team members to really rally around, understand what the goals and objectives are from the outset. And then also use that as kind of a working document or artifact with the clients so that we are literally on the same page and it's highlighting the things that are important."

(b) It was also common for participants to discuss alignment in terms of a 'check-in'; i.e., to assure a level of transparency about what team members were working on; P19, a consultant who worked on government-related projects discussed this type of alignment both among teams and for stakeholders:

> "Because it was a very small team, we could keep user research fairly visible easily and everyone on the same page, cause we're so small, we're just saying, 'okay, we're doing this today.' Our daily stand ups where we're like, a really good facilitation method of just showing us what's on the plate, what's coming and communicating...And another thing we had is just show and tell's, so sometimes each month that [stakeholder] we kind of just say what we're up to."

(c) We identified the sub-category of team building when participants referred to alignment in terms of 'togetherness' and bringing teams together through meetings or otherwise. For example, P12, a design lead for an in-house UX team, described the interpersonal benefits of getting their team on the same page:

> "We have a weekly, we call them 'Thank God it's Monday' meetings. And so it's just the design team we get together and talk about whatever it is that we need to talk about. If it's project based, if it's timeline based, if it's, you know, getting feedback and growing as designers, if there's skills that we want to pick up. So it's kind of open for the team."

(d) Finally, we also identified a generalized alignment that did not fit into the first three categories. This was typically to assure that the team had an 'accurate' or 'correct' understanding of some aspect of a project. P20, a senior designer for an in-house UX team, explained:

> "This is an opportunity for all the different teams that speak to users and gather data as well as insights…to get together and share what they're learning and make sure that everyone is aligned or that we're getting the right, like there isn't any red flags. Like maybe, if we're gathering data from Google Analytics, is this accurate or not accurate? Just to make sure we're on the same page."

Direct Collaboration

We identified two sub-categories of communication directly tied to collaboration: (a) when participants referred to using common platforms, a common language, and/or common assets

and (b) when participants referred to sharing assets for brainstorming and ideation.

(a) Many participants discussed the importance of using common platforms to share files and communicate directly with collaborators to get work done. P44, who had worked in multiple in-house organizations, reflected on why their team used Jira to communicate with developers:

> "That's where the developers already are. And the less I'd make the developers change their work habits, the more success I'm going to have getting them to do the things I want them to build…So it can't be just left to something casual...it needs to be like, we're going to fill out these tickets and we're going to attend these - if you're doing agile or scrum - we're going to attend these sprint meetings."

(b) Participants also discussed how they shared common assets, such as whiteboards, for brainstorming. In an example of this type of 'why', P61 told us about how their company used a common platform for ideation:

> "We use a tool called Mural… It's a kind of a collaborative, almost like a whiteboard…like post-it wall program where a bunch of people can get in it at the same time. They can collaborate. And you know, kind of brainstorm, share thoughts. So usually if we're working on a project or an idea that's in early stages, we'll all jump in a Mural together and kind of ideate there."

Persuasion and Getting Buy-in

Many participants reflected on a communication experience that had the goal of persuading team members, stakeholders, or others. In an example, P25, an independent consultant, discussed the importance of customizing communication strategies for the audience to maximize buy-in:

> "So the best way we found for [the client] to consume the information is, I kid you not, we print out on plotter paper one wireframe and assorted iterations...It works out to be probably three feet high and four feet long for each one of these. And they love it…they're eating it up. And they're consuming it and they're reacting to it and they are

engaging with it and well, shit, you can't ask for better. That's what you want the client to be doing. You don't want them to be falling asleep in a meeting because they don't understand what they're seeing on screen. So if you get to print it out and tap dance for 'em, great. If that's how they can communicate, that's what you need to do."

In another example, an in-house design team manager (P39), explained the need to get buy-in from executives to move forward with a project and add necessary resources:

"[It's] just the reality of business, we had to get approval to go forward. So we created some light prototypes to kind of like conceptually show what it might look like. We had no intention other than to convince the board and our senior stakeholders, 'Hey, this is painting a picture of what we can do.' So from there the researcher worked with a digital designer because we didn't have a UXer on the team at the time to create something, and we knew that the UX role, if we got approval, would be the key hire."

Feedback and Peer Review

Finally, we coded for feedback and peer review when participants explicitly discussed communicating in order to get and give feedback on in-progress design and research work. An apt quote in this category came from P7, an in-house UX researcher:

"...it's the ability for them to design something and then we can all go in and comment on it. That's rad. Cause it's just like this ongoing comment stream and that's everything from like the copy that's on that page. But also me walking in there and kind of being like, 'Hmm, I don't think we have this quite right, I don't think this really fits what we were trying to...whatever.' So that's giving actual feedback on design in that way."

Intended Audiences (Who)

In addition to the communication goal, the intended audience is a key factor that influences how information is communicated and in what form. When communicating with different audiences, practitioners chose different strategies and approaches for each group. Several participants reflect on how the choice of audience steers the communication method; as independent consultant P29 said:

"There isn't a silver bullet deliverable that gets everybody's juices flowing or, and creates a common understanding there. There's a toolkit of things I can do that I sort of pick from selectively depending on what I Intuit from the way my customer is."

When examining the intended audience(s), we identified four primary groups: (1) within the UX team, with (2) other internal teams, with (3) leadership, and with (4) external clients (see Table 2). In the following section, we explain these four groups and provide salient quotations that speak to nuances that inform the choices of communication strategies for each audience.

[Inset Table 2 here]

Within the UX Team

A key audience for communicating about UX work is other members of the UX team, which could include fellow researchers, fellow designers, or a mix of both. In terms of goals, communication within the UX team is mainly about getting feedback/peer review or facilitating direct collaboration, but they also include sharing research insights and alignment around a common vision. P38, a design director at an agency, explained that strong communication within the UX team is essential for collaboration:

"The team is always co-located together in a project space. And that project space, everybody moves their desks and people actually don't have separate seating areas outside of the project space if they're on a project. And so everybody is spending all their time together in close proximity and this allows the team to use a lot of conversation as well as a physical media to communicate with each other."

Within this category, we also identified a subset of interactions specifically between a manager or supervisor and their individual team members. These interactions often take the form of one-on-one weekly meetings where a manager checks in with the team member to understand what they are working on (alignment) and acts to remove obstacles or clarify

expectations (direct collaboration).

With Other Internal Teams

The participants in our study shared a wide range of other internal teams they work with to collaborate and coordinate UX work. These groups included developers, product or project managers, and people in business or marketing roles. These communication efforts were to communicate about the role of UX in relation to these other disciplines (sharing research insights, persuasion and getting buy-in) and also to coordinate across disciplines to move a project forward (alignment and direct communication). Many participants emphasized the importance of working closely with developers as a significant part of UX work. P46, a manager of an in-house UX team, explained the importance of communicating clearly and maintaining good relationships with developers:

> "Once we get to a point where we have a fair idea of this is kind of the approach we want to take, we'll bring in the dev[eloper] lead to validate that we're not going to create.... what we want or the scope of what we want to send something crazy that they're not going to be able to deliver."

With Leadership

We used the term leadership to describe other people within the organization who had influence or impact on a UX project but were not directly involved in the project itself. Depending on the organization, this can include C-level Executives and Vice Presidents. These stakeholders are typically engaged when there is a milestone or an important decision to be made and often the interaction focuses on the goal of getting their support and buy-in for a new product feature or approach. P23, a manager of an in-house design team, explained the nature of their interactions with leadership:

> "Well we have a new SVP [Senior Vice President] of product and we're doing a demo of some of the work that we've been doing next, early next week where sometimes we'll do it in front of the CEO and the COO and the CTO about concepts that we're working towards."

With Clients

UX practitioners who work in consultancies or agencies communicate frequently with their clients. While this category has some commonalities with the leadership category, they also are unique because, depending on the firm, clients can be engaged at different points in a project from discovery through prototyping and sometimes through the build out of the product. However, interactions with clients typically have high stakes since they are the customers paying for UX services. As P32, a design director for a digital agency, explained, communicating for persuasion and buy-in is critical as a consultant because you are always pitching to clients and moving across different domains:

> "I do find that I'm a pretty good consultant, but you know, it does weigh on your creative soul a little bit because you really get into just constantly pitching, pitching, pitching and the level that I'm at, I'm responsible for the profitability of my team and we constantly have to win new work and it does become a little bit of a grind because we do such diverse work that we're jumping from like products for small business owners to beauty products for the millennials, and then auto parts."

Further, the type of client or their industry often drives the requirements and deliverables for a project. Additionally, clients often have their own needs, nuances, and organizational culture that drives their interaction with the UX firm. For example, P21 reflected on the unique needs of government clients:

> "Government clients typically need more ... documentation for their reporting to have the artifact to hold up. They have a challenge of really needing to get buy-in from a lot of different teams often in the organization. So they really need the heavier artifact at the end where it is a more of a lengthier report."

Communication Methods (How)

Finally, our findings confirm that UX practitioners use a complex and evolving set of methods when communicating with different audiences to achieve a variety of goals. We present communication methods in three categories: techniques, artifacts, and tools. For clarity, we will discuss these methods as separate categories even though not all participants made an explicit distinction between them.

Techniques

We used the term techniques to refer to communication methods that involve the real-time exchange of information with other people. We identified eight unique techniques that were mentioned by two or more participants and mapped them on a spectrum from planned to impromptu (see Figure 1).

[Insert Figure 1 here]

On the left side of this spectrum, *planned* techniques are those which are scheduled or at least structured in advance and typically involve larger groups of collaborators, leaders, and clients. The most commonly used planned techniques were meetings (37%, n = 22), presentations (22%, n = 13), and workshops (17%, n = 10). They were typically used to share progress (alignment) and to get collaborators on board with an idea or direction (buy-in and persuasion). According to P7, an in-house senior UX researcher, planned techniques are also valuable ways to share research insights:

> "One common thing that we do here is...like an academic poster presentation, same idea, but you just make it a little more visually snazzy and you have food and you invite people to like browse the content rather than presenting it to them. And so those can get really creative...like you can bring a whole bunch of iPads and have them engage with the competitors. You can have a listening station where they can actually watch the focus

group you conducted. So there's a lot of creative things there just as far as getting actual

user's experience out to your team."

On the right side of the spectrum, *impromptu* techniques are ad-hoc interactions typically

between UX team members and direct collaborators. These techniques included critiques

(17%, n = 10), sitting together (8%, n = 5), and informal conversation (8%, n = 5). They were

used to critique ideas and concepts (peer review and feedback), share or revise in-progress

work (direct collaboration), and keep each other informed (alignment). In-house senior

designer P28, explained the value of these ad hoc interactions:

> "Oh, well we're super close. We all sit together...We have our own little pod to preserve
> this kind of unique culture of our team. There are days where I have a floating desk that I
> can go sit with my developers that I want and sometimes it makes sense that I do that,
> but I've always had a home base that is shared and it's like little creative hub...By sitting
> together, we get to eavesdrop on each other and just kind of banter and learn about just
> what's happened, what's happening in the business that might not immediately seem like
> impacts my work, but could potentially have downstream impacts."

Overall, participants described using a mix of both planned and impromptu communication

techniques; for example, they might hold regular team meetings and design reviews to mark

major project milestones while also utilizing informal conversations, on-the-fly critiques, and

improvised share-outs to brainstorm ideas and make incremental improvements.

Artifacts

We used the term artifacts to represent communication methods that involve recording,

visualizing, and transmitting information asynchronously. We identified 23 distinct artifacts

mentioned by two or more participants and mapped them on a spectrum of static to fluid (see

Figure 2).

[Insert Figure 2 here]

Artifacts on the *static* end of the spectrum represent a snapshot in time, while artifacts on the *fluid* end of the spectrum are meant to be iterated and refined over the course of a project. A key finding from our research is that participants did not typically express a preference for one type of artifact over the other. Instead, they tend to select artifacts based on their goal(s) and the intended audience(s), as explained by senior in-house designer P28:

> "It's not like everything you make needs to have wireframes and they all have to have an InVision and they all have to have, you know, X, Y and Z. It really is dependent on the need at the time. But some of the common ones are pen and paper sketches, some level of interaction, whether it's in a prototype or if someone codes it out. Sometimes it's easier just to sit with a developer and be like, 'Hey, can we throw this together real quick?' Um journey maps upfront towards the beginning of the project...Yeah, it's like the basic what you hear and what you see in every Medium article. It just depends on the situation."

Communication artifacts are chosen to achieve different goals, for different audiences, at different stages of the design process. At the beginning of a project, static artifacts like project briefs (3%, n = 2) crystallize the team's current understanding of the problem and define the scope of work (alignment) and personas (10%, n = 6) highlight user requirements (sharing research insights). The middle stages may feature some static artifacts (e.g., collages or photos, notes, and emails) to document major decisions but typically feature more fluid artifacts: journey maps (35%, n = 21), flows (13%, n = 8), site maps (3%, n = 2), and user stories (12%, n = 7) keep everyone on the same page (alignment); sketches (12%, n = 7), wireframes (22%, n = 13), and prototypes (30%, n = 18) allow for critique (peer review and feedback) and direct collaboration; and, style guides/pattern libraries (8%, n = 5) and design systems (13%, n = 8) are shared assets used by multiple team members to get work done (direct collaboration). Towards the end of a project, static artifacts like decks (13%, n = 8), written reports (12%, n = 7), and video/audio reels (18%, n = 11) can highlight project success and share key takeaways for stakeholders (persuasion and buy-in).

Tools

Participants also mentioned using a variety of tools to communicate with teammates, collaborators, and stakeholders. We identified 23 tools mentioned by two or more participants which we grouped into five categories: brainstorming, design, messaging, productivity, and project management (see Table 3).

[Insert Table 3 here]

Notably, all of these tools were explicitly mentioned as being used to communicate even though only messaging tools, e.g., Slack or MS Teams (32%, n = 19), and productivity tools, e.g., PowerPoint/Keynote (13%, n = 14), were created primarily for this purpose. For example, Miro (5%, n = 3) was designed for collaborative brainstorming and Jira (18%, n = 11) is a project management platform, but in meeting those needs they also facilitate communication for direct collaboration and alignment with UX team members and other close collaborators. Digital prototype tools like Sketch (32%, n = 19) and   Figma (13%, n = 8)   also offer in-line commenting to enable on-the-fly peer review and feedback or cloud-based editing to support real-time direct collaboration (again, with UX team members and other internal teams). Another key finding is that although participants used many different tools, they also noted the importance of being flexible and not locked in to any specific platform. Here's P3, a lead strategies and external consultant, describing the importance of exploring different tools:

> "The tech industry moves super-duper fast obviously, which means the tools we're using to do the work that we do is all moving super-fast as well...It may not be so much about trying to stay on top of...this trend, that's great however much you can do that, but being forced as part of our process to try different tools and use different tools to do some different things and to talk and learn about what the pros and cons of some of those different approaches are."

Discussion

Due to our sampling of a large number of participants across different types of organizations, industries, job titles and roles, our results provide insight into the "day-to-day, lived experience" of UX practitioners (Goodman et al., 2011) by offering a comprehensive overview of the rhetorically complex space of UX communication practices in the United States. Not only are UX practitioners skilled in using planned, purposeful techniques to persuade and educate different audiences, our findings confirm that they are also fluent in impromptu and fast-paced communication that facilitates ongoing collaboration and critique. We also showed that although UX practitioners do use common artifacts such as journey maps and written reports, they also have a dynamic process for choosing which artifact to use for a specific audience and purpose. Finally, UX practitioners adopt a range of tools, from messaging and productivity software to project management, design, and brainstorming platforms, to achieve different communication aims and to interact with collaborators and stakeholders.

     We believe these findings will help practitioners explore and expand their current practices, but they are also highly relevant for HCI education. Given that many HCI educators are charged with preparing students for UX careers regardless of where they end up being employed, be it a small boutique agency, a design-driven technology company, or a large government organization, it is important to convey the complexity and nuance required to communicate and collaborate in UX spaces. Simultaneously, we must calm the rhetorical complexity for students long enough for them to gain experience and skill in using common techniques and creating common artifacts, but then introduce the complexity by revealing the nuances of how the work is done in practice (Rose & Tenenberg, 2017). Teasing apart this complexity can be a challenge for teaching HCI, but it is crucial for aspiring UX practitioners. In this section, we reflect on the significance of our findings to the challenges

of teaching UX and offer three implications for educators seeking to address this complexity in their classrooms.

To contextualize these points, we will draw from two distinct but interconnected learning theories commonly applied to HCI education: situated learning and authentic learning. Situated learning asserts that knowledge and skills should be learned in "contexts that reflect the way the knowledge will be useful in real life" (A. Collins, 1988, p. 2). The defining characteristic of situated learning is what Lave & Wenger (1991) call "legitimate peripheral activity," or the notion that mastery of knowledge or skill requires learners to gradually become full participants in a professional community. While most applicable to a professional apprenticeship, scholars have adopted the notion of situated learning to classroom settings through the concept of the cognitive apprenticeship. In this model, educators demonstrate and expose students to professional practices by providing them with "authentic" learning experiences that reflect real-world contexts and challenges (Hill & Smith, 2005; Putnam, Dahman, et al., 2016; Turnbull, 2002).

An authentic learning environment has four characteristics: (1) course materials and activities reflect and are aligned with the outside world; (2) course assessment is based on realistic learning tasks; (3) instruction is personally meaningful to the learner; and (4) learning activities are aligned with the intellectual traditions of the discipline (Rule, 2006; Shaffer & Resnick, 1999). For HCI education, authenticity therefore means (1) creating classroom activities and learning experiences that mirror real-world UX contexts; (2) assessing students in ways that reflect those activities; (3) making sure learning is personal and meaningful for students; and (4) using problem-solving strategies and approaches that reflect those used by UX professionals. A focus on authentic learning also helps to cultivate students' instrumental judgement, or their capacity to choose appropriate methods for

approaching design problems (Gray & Boling, 2018; Murdoch-Kitt et al., 2019; Nelson & Stolterman, 2012).

In this section, we outline three important implications from our research that can shape how and to what extent educators can create authentic learning experiences for students. We present these ideas as prompts and considerations to inform teaching rather than as concrete recommendations, as we understand HCI learning contexts vary greatly. We also stress that these ideas are meant to be conversation starters and to encourage further exploration of different pedagogical strategies. We are very aware of how making big changes in our teaching feels risky. Therefore, we recommend that educators consider how these ideas may be incorporated (a) at the curricular level, in modifying a program's structure, degree requirements, or tracks/concentrations, (b) at the course level, in changing or adapting different teaching practices or pedagogical strategies, and (c) at the project or assignment level, in changing deliverables or modifying assessment criteria. Where possible, we provide example strategies from existing HCI programs or courses that can serve as inspiration.

Embrace the Rhetorical Complexity of HCI

Reflecting on our own teaching practices and discussing these challenges with other instructors, we acknowledge that we too often ask our HCI students to produce static design deliverables as evidence of learning. This tendency seems appropriate given that students are engaged in producing artifacts that can demonstrate technical skills such as prototyping and creating research reports in the relatively short amount of time of an academic term (quarter or semester). However, our findings show that in practice, UX professionals use a full spectrum of communication techniques and artifacts with an increasing shift to those that are more impromptu and fluid. Therefore, as instructors we should aim to increase the diversity

of communication methods that students use during their HCI coursework and programs. Summative deliverables are always needed, especially to show a full understanding of the design and research process in UX. However, giving students opportunities to use less formal and more ad hoc communication methods - and assessing them for clarity and purpose - can help students gain a deeper understanding of communication practices common in industry.

Importantly, re-conceptualizing how students practice and are assessed for their communication skills can create a learning context that better reflects how those skills are used in real world situations (A. Collins, 1988). In the professional world, UX practitioners do not always create a specific artifact or rely on a particular technique, as the structure of HCI coursework often implies. Instead, they deliberately choose a method based on (a) who they are trying to engage and (b) what they are trying to achieve. Therefore, we encourage educators to intentionally focus on teaching students *how to select* appropriate communication methods based on those two factors rather than just dictate the creation of specific deliverables, which can lead to communication being seen as just a ritual or algorithm (McCormick, 2004). In addition to emphasizing the intended audience(s), it's also crucial to acknowledge the different goals of UX communication. Historically, creating empathy for users and explaining user requirements has been viewed as one of the most important goals of UX communication. While our findings support this as a common goal, they also identify other important goals for UX communication, such as establishing a shared vision among a multi-disciplinary team or articulating one's internal thought process or approach, typically as a way to solicit peer feedback or provide a rationale for the design choices. For students, this means communication deliverables should be tailored to appeal to the specific needs and expectations of each intended audience. For educators, this means extending the learning experience beyond the creation of the deliverable to include the choice of deliverable, its interpretation and use, and how effective it is for its intended audience(s),

which will help students develop instrumental judgement on when and where to use the multiple communication methods available.

While these ideas may seem daunting to explore, many HCI educators are already applying some of these pedagogical strategies. For example, faculty in the New Media Design programs at Tilburg University are shifting their focus away from assessing design artifacts in isolation and instead evaluating whether students are effectively contributing and conveying new knowledge (Slegers et al., 2019). In the UX Design program at the University of Toronto, some faculty are using "gradeless learning" in which instructors articulate the goals of an assignment rather than creating a standardized grading rubric. This "ungrading" approach emphasizes peer critique and iterative improvement, which challenges students to become creators who own, evaluate, and validate their own work and that of their peers (Pandeliev, 2020). As an alternative approach, Lallemand (2021) developed a "self-exploration" booklet featuring rich method descriptions and case studies that help students build a deeper understanding of different research methods and when/how to apply them. While more work would be needed to collect a similarly robust set of case studies, this approach could be adapted to focus explicitly on teaching students how to selectively apply different communication methods.

Simulate Real-World Communication Challenges

Client- or community-based projects, where students apply their UX skills to address an existing real-world problem, have long been a feature of HCI education (Fernandez, 2004; Lazar, 2011; Shneiderman et al., 2006). These "real-world" projects offer many benefits, including helping students gain confidence in their skills, learn how to interact with external stakeholders, and build a stronger portfolio (MacDonald & Rozaklis, 2017). However, an underappreciated benefit of these projects is that they offer students opportunities to identify

and overcome realistic challenges to effective communication. It is well-established that UX professionals need to be able to communicate effectively with a variety of different audiences, and that each audience requires its own unique approach (Goodman, 2013; Gray et al., 2015). In particular, it was clear from our analysis that a significant portion of any UX professional's interactions is with people beyond the UX team. Whether it's clarifying the scope of a project, establishing a clear target or goal, or ensuring everyone understands specific research insights, UX professionals need to learn how to communicate across disciplinary boundaries and establish common ground.

Real-world projects create more personally meaningful learning experiences by tasking students to solve a specific real-world problem, but they can also more accurately reflect the real-world communication challenges and difficulties inherent to professional UX practice (Shaffer & Resnick, 1999). External clients or stakeholders likely come from other disciplines and backgrounds, which should inspire students to critically think through their choice of communication tool, technique, and artifact. Further, whenever possible, educators should strive to create learning opportunities that bring together students from different disciplinary perspectives to simulate the complex rhetorical situations that students will find themselves in as they begin their careers. For example, faculty members in the MSc program in Information Systems and HCI at HSE University St. Petersburg have aligned their User-Centered Design and Information Systems Architecture courses to give students' hands-on experience with different stages of UX design and development work (Musabirov et al., 2020). Similarly, faculty in the School of Design at the University of Cincinnati are exploring the use of community projects that require students from different disciplinary backgrounds (e.g., graphic design and information technology) to share knowledge and collaborate with each other (Jung & Srivastava, 2020). If instructors are unable to combine students from different disciplines, they should still strive to create project teams that include students with

varied backgrounds and experience levels. As one example, the UX Design program at Purdue University uses "vertically integrated" studios in which students from different cohorts all work together on a single studio-based project (Parsons et al., 2020).

Finally, our findings suggest it would be helpful for students if they are introduced to tools and approaches that are widely used in industry. For example, many HCI courses still follow a waterfall model even though this methodology is increasingly rare. As a result, students may emerge from their courses or programs unprepared to work in agile or hybrid 'wagile' environments (Steane et al., 2020). To address this challenge, educators should consider simulating features of agile development to provide students with communication opportunities that mirror practical settings. Further, by using industry-standard technical platforms or project management tools, students can gain practice and proficiency with these tools. For example, using Slack for project coordination, using a Trello-based KanBan board to make task completion visible, or using Jira to create and track user stories and their associated design tasks.

Highlight the Performative Elements of Communication

As our findings demonstrate, the types of communication skills used in UX practice are rich and diverse. Further, a majority of the participants in our study emphasized the importance of developing strong communication practices for the UX team. Keeping open lines of communication, encouraging the solicitation of feedback in both formal and informal formats, and encouraging team members to provide feedback on in-progress projects is essential not only to the health of the UX team but also to the growth of each individual UX professional. These examples all highlight the fact that the performative elements of UX communication (Goodman, 2013) are far more important than many educators may realize.

First, there's the performance of engaging stakeholders using storytelling techniques to persuade them to adopt a certain perspective or make a certain decision; this performance act is particularly important in agency settings, where practitioners must gain the trust and support of their paying clients. Next, there's the performance of sharing research insights in a way that non-UX people can understand and appreciate them. There's also the performance of a design critique: being able to articulate one's decision-making process, talk through an idea, and respond in real-time to critical feedback, regardless of medium or audience. Workshop facilitation is also a performance that demands holding people's attention, stimulating discussion, and establishing a shared vision. Finally, there's the performance of informal communication, in which clarity and consistency are paramount to building strong relationships and being perceived as a valued team member. No matter the context and no matter the method, a UX professional must be able to effectively engage an audience, tell a compelling story, and make progress toward achieving specific goals. Therefore, an authentic learning experience means making these performative elements more visible (Rule, 2006).

There are several strategies for highlighting the performative elements of communication in the classroom. For example, instructors can model different impromptu communication opportunities, such as holding regular team meetings to check in on project status and discuss solutions to ongoing challenges (Parsons et al., 2020) or, for smaller cohorts, hold regular one-on-one meetings with students to mirror the mentoring relationships they may experience on the job. To help students practice their facilitation skills, instructors can moderate in-class debates (Xenos, 2019), assign students to lead class discussions about critical topics (Slavina & Gilbert, 2021), or have students develop and teach in-class workshops on different methods (Leshed, 2019). Faculty can also incorporate more performative methods into their courses, such as experience prototyping with integrated storytelling (Mitchell et al., 2019), improv-based brainstorming activities (Leshed, 2019), or

roleplaying to present research outcomes (Fass & Groves, 2019). Finally, facilitating regular

design review or critique sessions, a staple of studio-based pedagogy (Arvola & Artman,

2008; Brandt et al., 2013), can help prepare students for the high levels of public feedback

they will receive on the job. These sessions can help students achieve fluency in giving and

receiving feedback, practice their articulation skills, and gain confidence in using different

communication techniques. If these learning experiences become standard elements of HCI

education, students are more likely to recognize the value of performance in advancing their

work and understand how to apply different performative strategies in different contexts.

Limitations and Future Work

One important limitation of our study is that it included a highly U.S.-focused sample (recall

that only three individuals we interviewed were not located in the U.S.). As a result, our

findings may not reflect UX practices in other areas of the world, especially in regions where

the UX industry is more nascent or emerging. Additionally, most of the interviews were

conducted prior to the COVID-19 lockdowns; as such, we do not have a good sense on how

the rise of remote working has impacted communication practices. Finally, because our

interviews were not explicitly designed to explore communication, we could only analyze

what participants shared during these interview segments and could not account for what

participants did not say about their communication practices. As a result, our results may not

represent an exhaustive inventory of all the ways in which UX practitioners communicate.

Our findings of the complexity of the communication space therefore have implications for

future research more focused on how practitioners choose their methods, how they tailor their

messages for various audiences, and a more in-depth exploration of communication successes

and failures.

Other future work also includes further exploration (and assessment) of the suggestions for pedagogy that are outlined in our discussion. We envision recruiting other instructors and engaging them in a conversation about how they currently teach communication skills (and which of the strategies they might already employ) and then how they might incorporate some of our lessons (if they do not currently do so). We then plan to return later to evaluate what worked (or did not) and how variables such as course format (e.g., lecture vs. studio, online vs. in-person) or education level (e.g., undergraduate vs. graduate) are perceived as influencing the success of different pedagogical strategies.

Conclusion

In this paper, we presented findings from 60 interviews with senior UX professionals in which we explored their communication goals, audiences, and methods. As a whole, we confirmed that the UX communication landscape is diverse and complex, with practitioners selecting from a range of techniques, artifacts, and tools to achieve specific goals when interacting with their teammates, other collaborators, and high-value stakeholders. Our findings are of interest to UX practitioners who want to explore expanding their communication repertoire, and to researchers interested in understanding how HCI methods are applied in industry settings. However, the major contribution of this work is for informing how HCI educators incorporate communication into their curriculum to better prepare their students for UX practice. We offered three ways in which educators might incorporate the rhetorical complexity of UX communication in their classrooms: (1) embrace the complexity by introducing students to a range of goals, audiences, and methods and how those interplay, are dynamic and subjective; (2) simulate or seek out real-world contexts for students to practice their communication skills in more practice-like settings, increase the stakes, and expose them to the challenges of communicating with multidisciplinary collaborators; and (3)

highlight the performative aspects of communication by providing space for students to practice articulating their findings and decisions through storytelling and conversation. By incorporating a wider array of communication strategies into HCI courses, educators can teach students how to amplify their expertise and become more effective contributors throughout their UX careers.

Craig M. MacDonald is an Associate Professor in the School of Information at Pratt Institute where he also directs the Center for Digital Experiences, a student-driven UX consultancy and academic research lab. His research focuses on strengthening organizational UX practices and improving HCI and UX education.

Emma J. Rose is an Associate Professor in the School of Interdisciplinary Arts & Sciences at the University of Washington Tacoma. Her research focuses on human-centered design, participatory and inclusive methods, and UX pedagogy.

Cynthia Putnam is an Associate Professor at DePaul University's College of Computing and Digital Media. She teaches in the graduate human-computer interaction program (HCI). Her research interests are in HCI pedagogy, accessible computing, and child-computer interaction.

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Appendix 1. Summary of study participants, including job details, education, experience, and location.

ID	Title/Role	Type	Industry	Manager	Highest Degree	HCI degree	Years in Industry	Location
P1	UX Consultant	Agency	General		PhD	Yes	7	US-East
P2	Senior User Researcher	In house	Software		Masters	Yes	8	US-West
P3	Senior Solutions Architect	Agency	General	Yes	PhD	Yes	10	US-Midwest
P4	Lead UX Researcher	In house	Consumer Electronics	Yes	Masters	Yes	8	US-West
P5	Research Associate	Agency	General		Masters	Yes	22	US-West
P6	Principal, Content Strategy	In house	Cybersecurity		Masters	Yes	10	US-West
P7	UX Researcher	In house	Social Media		Masters	Yes	14	US-West
P8	Director of UX	In house	Healthcare	Yes	Bachelors		12	US-West
P9	Design Team lead	In house	Industrial products	Yes	Masters	Yes	15	US-West
P10	User Researcher	Consultancy	Education		PhD	Yes	6	US-East
P11	Human Factors Engineer	Consultancy	Medical Devices		Masters	Yes	<1	US-West
P12	Design Lead	In house	Education	Yes	Bachelors		7	US-West
P13	Design Lead	Agency	IT services		Bachelors	Yes	11	India
P14	UX Consultant	Agency	General		Masters	Yes	38	US-East
P15	Founder and Principal	Agency	General		Masters	Yes	32	US-East
P16	Senior Design Research Manager	In house	E-commerce	Yes	Bachelors		12	US-West
P17	Senior UX Researcher	In house	E-commerce		Masters	Yes	8	US-West
P18	UX Designer / Product Manager	Consultancy (internal)	Government		PhD	Yes	7	US-West

ID	Title/Role	Type	Industry	Manager	Highest Degree	HCI degree	Years in Industry	Location
P19	User Researcher	Consultancy (internal)	Government/Healthcare		Masters	Yes	6	Europe
P20	Senior Product Designer	In house	Heath/Lifestyle	Yes	Bachelors		5	US-East
P21	Senior Researcher	In house	Marketing	Yes	Masters	Yes	6	US-East
P22-1	CEO, Founder	Agency	General	Yes	Masters		20	US-East
P22-2	Design Director	Agency	General	Yes	Bachelors		19	US-East
P23	Senior Director of UX	In house	Enterprise Software	Yes	unknown		20	US-West
P24	Director of Design	In house	Financial services	Yes	Bachelors		20	US-West
P25	Director of UX Design	Agency	General	Yes	Bachelors		29	US-East
P26	Head, User Experience	In house	Telecommunications	Yes	Masters	Yes	7	US-East
P27	Experience Design Director	Agency	General		Masters	Yes	11	US-East
P28	Senior Product Designer	In house	Education		Bachelors		7	US-East
P29	Lead UX Architect	Consultancy	General		Bachelors		20	US-East
P30	UX Lead	In house	Financial Services		Bachelors		17	US-East
P31	UX Lead	In house	Healthcare	Yes	Bachelors		24	US-East
P32	Director, Experience Design	Agency	General	Yes	Bachelors		8	US-East
P33	Director of UX Design	In house	Telecommunications	Yes	Bachelors		11	US-Midwest
P34-1	Managing Director	Agency	Medical Devices	Yes	Masters		17	US-Midwest
P34-2	Senior Vice President, User Experience	Agency	Medical Devices	Yes	unknown		10	US-Midwest
P35	Director of Mobile Applications	In house	Consumer Products	Yes	Bachelors	Yes	11	US-Midwest

ID	Title/Role	Type	Industry	Manager	Highest Degree	HCI degree	Years in Industry	Location
P36	Manager, Research & Human Factors	Agency	General	Yes	Bachelors		7	US-Midwest
P37-1	Manager, UX and Product Design	In house	Insurance	Yes	Masters	Yes	7	US-Midwest
P37-2	Manager, Visual Design and Content Strategy	In house	Insurance	Yes	Bachelors		25	US-Midwest
P37-3	Vice-President, UX & Design	In house	Insurance	Yes	Masters		22	US-Midwest
P37-4	Manager, User Interface Engineers	In house	Insurance	Yes	Masters	Yes	19	US-Midwest
P37-5	UX Strategist	In house	Insurance	Yes	Bachelors		33	US-Midwest
P37-6	UX Researcher	In house	Insurance		PhD		10	US-Midwest
P38	Senior Design Director	Agency	General	Yes	Masters	Yes	10	US-East
P39	Director of UX Design and Design Operations	In house	Financial Services	Yes	Masters	Yes	13	US-East
P40	Manager, UX & Research	Consultancy	Cybersecurity	Yes	PhD	Yes	5	US-East
P41	Senior Manager	In house	Financial Services	Yes	Masters	Yes	5	US-Midwest
P42	Freelancer	Consultancy	General		Masters	Yes	7	US-West
P43	UX Manager	In house	Government	Yes	Bachelors		17	US-East
P44	Director of Product Development	In house	E-commerce	Yes	Bachelors		9	US-West
P45	Director of UX	In house	Healthcare	Yes	Masters	Yes	14	US-Midwest
P46	UX Manager	In house	Financial Services	Yes	Masters	Yes	9	US-Midwest
P47	Principal, UX	In house	Retail		Masters	Yes	8	US-Midwest

ID	Title/Role	Type	Industry	Manager	Highest Degree	HCI degree	Years in Industry	Location
P48	Director of UX	In house	Travel	Yes	Masters	Yes	24	US-Midwest
P49	Senior Director, Experience Design	Agency	Healthcare	Yes	Masters	Yes	17	US-Midwest
P50	Managing Partner	Agency	Medical Devices	Yes	Masters	Yes	12	US-East
P51	Director of Design Operations	In house	Food services	Yes	Masters	Yes	19	US-Midwest
P52	Senior Manager, Experience Research	In house	Heath/Lifestyle	Yes	Masters	Yes	7	US-West
P53	UX Consultant	Consultancy	General		Bachelors		20	US-East
P54	Design Director	In house	Insurance	Yes	Masters	Yes	8	US-Midwest
P55	Director, Research Team	In house	Medical Devices	Yes	Masters	Yes	8	US-Midwest
P56	Director, UX Research	In house	E-commerce	Yes	Bachelors		18	US-Midwest
P57	Manager, Product UX	In house	Software	Yes	Bachelors	Yes	10	Europe
P58	Senior Interaction Designer	In house	Software		Bachelors		10	US-Midwest
P59	Senior UX Researcher,	In house	Retail		Masters	Yes	10	US-Midwest
P60	Business Analyst / Consultant	In house	General	Yes	Bachelors		10	US-Midwest
P61	Senior Product Designer	In house	Software		Masters	Yes	7	US-Midwest
P62	Senior UX Researcher	In house	Automotive	Yes	Masters		20	US-Midwest
P63	Senior Manager, Product Design	In house	Software	Yes	Bachelors	Yes	12	US-Midwest
P64	Consultant	Consultancy	General		Masters	Yes	20	US-Midwest

Table 1. Commonly cited communication goals. Percentages based on N = 60 recorded interviews.

Category	%	n
Sharing research insights	57%	34
Alignment	47%	28
Direct collaboration	45%	27
Persuasion and getting buy-in	37%	22
Feedback and peer review	27%	16

Table 2. Commonly cited audiences. Percentages based on N = 60 recorded interviews.

Category	%	n
Within the UX team	85%	51
With other internal teams	92%	55
With leadership	15%	9
With clients	30%	18

Table 3. Commonly used communication tools, by category. Percentages based on N = 60 recorded interviews.

Category	Name	%	n
Brainstorming	Whiteboard	12%	7
	Miro	5%	3
	Mural	3%	2
Design	Sketch	32%	19
	Figma	13%	8
	InVision	13%	8
	Adobe XD	5%	3
	Axure	5%	3
	Illustrator/ Photoshop	3%	2
	Balsamiq	3%	2
	OmniGraffe	3%	2
	Zeplin	3%	2
Messaging	Slack/MS Teams	32%	19
	Blue Jeans	3%	2
	Skype	3%	2
Productivity	PowerPoint/ Keynote	23%	14
	Dropbox	3%	2
	Excel	3%	2
	Google Suite	3%	2
Project Management	Jira	18%	11
	Confluence	13%	8
	Sharepoint	5%	3
	Trello	5%	3

Figure 1. Commonly used communication techniques, from planned to impromptu. Percentages are based on N = 60 recorded interviews.

Figure 2. Commonly used communication artifacts, from static to fluid. Percentages are based on N = 60 recorded interviews.