

Two

Analyzing Procedure to Make Sense of Users' (Inter)actions

A Case Study on Applying the Ethnography of Communication for Interaction Design Purposes

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The information communication technologies of our early twenty-first century support an astonishingly complex range of person-to-person interactions, from the local to the global, from mundane to extraordinary, for purposes modest to lofty. Designing user experiences for today's global, technology-mediated interactions is no simple matter, particularly when platforms are intended to connect people across linguistic and cultural borders, via a multiplicity of channels and modes. What's more, such platforms must often serve different purposes for multiple stakeholders, such as whole organizations, their service providers, and their clients/users. Utilizing a local strategies research perspective can be helpful in navigating this multifaceted design terrain. In this chapter, I describe two related conceptual tools, act sequence and procedural knowledge, which are grounded in the ethnography of communication research tradition. Using a case study on Eloqi,² a virtual organization that built and deployed an online English as a foreign language (EFL) training program for paying customers in China, I will demonstrate how act sequence and procedural knowledge can be used to examine local understandings about acting, action, and practice in technology-mediated settings. More specifically, I will use these key concepts to analyze problematic user experiences that occurred during live interactions between Eloqi's employees (English trainers) and their clientele (students). To situate my study I discuss the theoretical context for this work, introducing pertinent concepts drawn from the ethnography of communication and outlining their relevance to interaction design. I then present the research context for this case study, followed by the data analysis and findings. Finally, I suggest the broader implications of this research.

THEORETICAL CONTEXT

The ethnography of communication (EC) is a distinct theoretical and methodological approach to studying situated communication practices as well as the local cultures and strategies that such practices instantiate. EC is closely related to ethnography, a social scientific research tradition rooted in the discipline of anthropology. Like ethnography, which “[discerns] patterns of socially shared behavior” (Wolcott 1999, 67), EC research is used to produce ethnographic reports detailing and interpreting local cultural processes. As with traditional ethnography, EC typically involves immersion in a local setting, during which time the researcher employs various methods of data collection, primarily qualitative (participant observation, interviews, etc.) but possibly quantitative, too. EC is differentiated from ethnography by its lineage and focus: it was born from linguistics, focuses on communication practices, and uncovers “relationships between language and culture” (Keating 2001, 285). More specifically, by examining the patterning of communication norms, rules, practices, and meanings, EC-grounded research can effectively discern local beliefs about personhood (what it means to be a person in the world), sociality (how to connect with others in a community), and rhetoric (how to communicate strategically to achieve one’s desired goals) (Philipsen and Coutu 2005; Carbaugh 2005, 2007; Philipsen 2002; Philipsen, Coutu, and Covarrubias 2005).

In the last twenty-five years, EC scholars have produced substantial reports analyzing the communication practices and traditions of local communities. This body of work represents a wide variety of languages and cultures, and includes both intercultural analyses as well as cross-cultural comparisons (Baxter 1993; Carbaugh 1988, 2005; Coutu 2000; Edgerly 2011; Katriel 1986; Katriel and Philipsen 1981; Philipsen 1975, 1992, 2000; Philipsen and Leichter 2007; Winchatz 2001; Fong 2000; Leichter and Black 2010; Sprain and Gastil 2013; Witteborn and Sprain 2009). There is now a growing interest in using EC-grounded approaches to study online and other technology-mediated communication, whether to examine the communication and cultural life of online communities or the ways in which people interact with technologies offline (Carbaugh et al. 2013; Dori-Hacohen and Shavit 2013; Witteborn 2011, 2012; Boromisza-Habashi and Parks 2014; Hart 2011). Just as communication scholarship in general can contribute to design work (Jackson and Aakhus 2014; Aakhus and Jackson 2005), EC has much to offer towards the strategic design of communication structures, actions, and practices (Leichter, Rudnick, and Edmonds 2013; Sprain and Boromisza-Habashi 2013), including those for technology-mediated environments. In fact, several key characteristics of EC research make it a good fit for user experience research and interaction design.

User interfaces (UIs) are a means not only of presenting information, options, and activities to the user, but also of organizing information, options, and activities. As such they are communication tools that support communication processes, and they embody, employ, strategically utilize, and support communication conventions. In basic design terms, the UI must communicate its functionalities and protocols to the users clearly enough that they can easily intuit what to do, when, and how (McKay 2013). The UI, however, is just one component of the larger user experience (UX), which “encompasses the entire experience users have with a product [including] the internals that users don’t interact with directly, as well as the externals, such as the purchasing process, the initial product experience (often called the ‘out-of-box’ experience), customer and technical support, product branding, and so on” (McKay 2013, 6–7). The ultimate aim in designing a UX for a technology-mediated environment is to foster the possibility for what is dubbed agency.

Agency results when the interactor’s expectations are aroused by the design of the environment, causing them to act in a way that results in an appropriate response by the well-designed computational system. This matching of the interactor’s participatory expectations and the actions to the procedural scriptings of the machine creates the pleasurable experience of agency. Bad design frustrates the interactor by creating confusing or unsatisfiable expectations, or by failing to anticipate actions by scripting the machine with appropriate responses. (Murray 2012, 12–13)

In other words, the ideal technology-mediated environment invites instinctive actions that match users’ own “mind maps” for engaging in the task and/or interaction at hand. If the user can act instinctively in the environment and produce the appropriate (anticipated, desired) results, then the design is a success.

Achieving the desired degree of agency in a build may be complicated by the fact that the build itself (the UI, or the technology supporting the communication) shapes the process of using it (Appel et al. 2012), sometimes in unexpected ways. Presumably, designing for maximum agency becomes even more complex when the build connects users for person-person interactions, whether asynchronous or synchronous, or via text, audio, and/or video. In these cases the design has an immediate impact not only on the user-machine interaction, but also on the user-user interactions being supported by the technology (Appel et al. 2012). In these cases, designers must account for multilayered and complex sociocultural dynamics impacting the user experience: users’ social orientations towards their interactions with the technology (Nass, Steuer, and Tauber 1994), “the interpretation of [technological] artifacts as part of larger social and cultural systems” (Murray 2012, 11), the interactions

of users with other users via the technology (Dix et al. 2004), and the sometimes nebulous social conventions that users develop for use in particular technology-mediated communication situations (Vorvoreanu 2009). Because of this, it makes sense to include sociocultural analysis into UX design, all the better to understand how “design decisions that shape [digital artifacts] affect the way we think, act, understand the world, and communicate with one another” (Murray 2012, 2).

The definition of agency presented above, particularly as it applies to user experience and design, strongly parallels a concept central to EC: communicative competence. Communicative competence is the ability to communicate appropriately with others according to the local norms, premises, rules, and other socio-linguistic factors of the given context (Hymes 1972a, 1972b; cf. Sprain and Boromisza-Habashi 2013; Witteborn 2003). From the EC perspective, standards of communicative competence are applied in all social groups, across all potential means, modes, and styles of communication. What those standards of communicative competence are, however, will vary widely according to the local setting, participants, goals, norms, etc. (i.e. the local culture). For this reason, defining communicative competence always necessitates carefully identifying how one is expected to communicate properly according to the local culture and the given circumstances (Philipsen 2010). As the above definition of agency suggests, this is precisely the aim of good user design. To produce good builds, designers must thus be highly attentive to the social conventions (norms, premises, rules, etc.) associated with technology use. These conventions include those “that govern our navigation of space, our use of tools, and our engagement with media” (Murray 2012, 10) as well as those governing users’ interactions with one another. As sociocultural artifacts, some of these conventions may be universal (culturally general), but they are likely to include local (culturally specific) conventions, too. Whether designing a communication tool or a strategic communication process, the objective is to create a build that fits with and leverages users’ intuitive, locally endorsed ways of being, connecting, and communicating (Leighter, Rudnick, and Edmonds 2013; Sprain and Boromisza-Habashi 2013). The EC approach provides us a means of discovering these locally endorsed ways (Hymes 1962, 1972a; Saville-Troike 1982).

Being communicatively competent requires acting in accordance with context-specific variables (Philipsen 2000) such as the setting, participants, goals, norms, etc. These variables are neatly summarized in the SPEAKING heuristic (Milburn n.d.; Hymes 1962, 1972a), an EC tool for analyzing situated communication summarized in Table 2.1. Here I call out one variable in particular: the act sequence. Act sequence denotes the sequence, or order, in which a communicative activity is expected to play out (Hymes 1962, 1972a; Saville-Troike 2003). Act sequences for everyday

Table 2.1. Hymes's SPEAKING Heuristic

Setting/Scene	What is the setting in which the communication activity is taking place?
Participants	Who is involved in the communication activity? What are their roles and relationships?
Ends	What are the goals of this communication activity?
Act sequence	What are the activities comprising the communication activity, and how are they sequenced?
Key Instrumentalities	What is the tone of the communication/activity? How is the communication being carried out? Through what modes and/or means?
Norms	What are the social norms governing communication here?
Genre	What is the genre or style of this communication activity?

Table created by Tabitha Hart referencing work by Dell Hymes. Please see this chapter's references for a complete list of Hymes's works utilized.

and routinized behaviors are "conventionalized" patterns of communicative behavior, often distinct to the local cultural milieu in patterning, form, and/or content (Hymes 1962, 1972a; Saville-Troike 2003). We naturally draw on our learned, localized understandings of act sequences as we engage in tasks, social situations, and other types of routine activities, including those mediated by technology. With, for example, a work-related email, the standard act sequence would be a salutation followed by the main point of the message, with a valediction at the close.

To know an act sequence for a given activity is equivalent to possessing procedural knowledge, that is, the knowledge of what steps or actions should occur, how they should be carried out, and in what particular sequence (Shoemaker 1996; Nickols 2000). Here again, there is a clear connection between UX and EC: good design leverages users' procedural knowledge and engages users in act sequences that feel natural and logical. Where "a poorly designed UI is unnatural...and requires users to apply thought, experimentation, memorization, and training to translate it into something meaningful" (McKay 2013, 3; cf. Nielsen 1994; Nielsen 2015), a good design presents users with a natural "fit" between the procedural knowledge that they hold in mind and the act sequencing built into the design. Importantly, the EC approach provides a theoretical/methodological approach to identifying what act sequences are considered natural or logical in local contexts, thereby aiding in the process of inventorying users' procedural knowledge. It can be challenging to articulate procedures, given the innateness of this type of knowledge,³ so this is a very useful feature of EC.

An opportune situation for identifying procedure is clash, or cases in which interlocutors apply different and/or conflicting notions of

procedural knowledge (Shoemaker 1996; Holdford 2006; Bailey 1997). The EC approach is especially well suited to studying such cases and helps researchers attune to “the differences in communication practices and that lie at the root of different social, technical, or environmental disputes or miscommunication” (Sprain and Boromisza-Habashi 2013, 183). Numerous EC reports have been produced that identify and examine cases of communication tension and clash in real life settings (Coutu 2000, 2008; Bailey 1997; Huspek 1994).

Finally, once local concepts of communicative competence and proper act sequence have been identified, EC findings can be used to “suggest modes of intervention that resonate with local needs and local systems of meaning” (Sprain and Boromisza-Habashi 2013, 182; Sprain and Gastil 2013), making it a perfect fit for the iterative design/redesign approach favored in the field of UX (Cooper 2004).

To summarize, the EC approach is tailor-made for focusing on real users rather than imagined ones, actual practices rather than assumed ones, and local concepts of natural and correct communication as performed and described by users themselves. In all of these senses, EC research is truly a user-centered approach (Witteborn 2012; Witteborn, Milburn, and Ho 2013) and highly suited to UX/design purposes.

RESEARCH CONTEXT

Eloqi (2006–2011) was a small startup company that built and deployed an online English as a foreign language (EFL) training program for paying customers across China. Eloqi’s training program focused on oral communication skills and was designed to help customers pass the oral component of the IELTS, an internationally recognized English proficiency exam. By logging into Eloqi’s password-protected spaces, customers could access the company’s specialized learning modules (lessons, homework assignments). More importantly, they could use the company’s interactive, web-based, and voice-enabled UI to connect one-to-one with English trainers in the United States for live fifteen-minute conversation lessons.

With Eloqi’s express support I conducted an ethnographic study of the company, whose members (students, trainers, and admins) met almost entirely online. The most important period of my study was the ten months from 2009 to 2010 when I conducted online participation observations within the Eloqi community. As a participant observer I was inducted into the Eloqi trainer pool. In this role I participated regularly in the community’s online activities, reading and responding to posts in the trainer forum, attending weekly trainer meetings, working shifts,

and hanging out with the other trainers—all online. Most importantly, I worked directly with Eloqi's students, training them in English conversation skills in intensive one-to-one fifteen-minute sessions, just as the other trainers did.

At the time of my participant observations, Eloqi's most popular lessons were those in the Core English Logic (CEL) series, which the company developed expressly to prepare students for the oral component of the IELTS. The CEL series was the brainchild of the company's chief technology officer, who had assembled a team to crack the code of the IELTS oral exam. After researching the types of questions posed to candidates, this team identified what they believed to be a comprehensive set of thirty-one common IELTS question formulations. Accordingly, Eloqi created the CEL lesson series to teach students clear-cut strategies for classifying and answering each of these questions types, a sampling of which is presented in Table 2.2.

To access the CEL lesson series, students contacted the Eloqi office (located in Beijing, China) by phone or email to purchase a subscription. Once subscribed, the students were free to access the Eloqi platform, where they could choose which lessons they wanted to do during the available timeslots of their choice. Once a student had initiated a lesson, he or she would use an Internet-enabled device to work through a self-guided online pre-activity. All pre-activities were designed to prepare students for their live interactions with trainers, and included materials on relevant vocabulary, pronunciation, grammar, and so on. After completing the pre-activity, students would be placed in an online queue to be connected with the next available trainer. When the student's turn

Table 2.2. Eloqi CEL Question Types and Recommended Answer Strategies

<i>CEL Question Type</i>	<i>Eloqi's Recommended Strategy for Answering</i>
How often do you do X?	To talk about how often you do something, state how often you do it. Explain why you do it at that particular degree of frequency. Give detailed reasons. Give examples.
What do you usually do?	To speak about what you usually do, state what you do when you get up in the morning. Next, state what you do at different parts of the day. Say how often you do these things (sometimes, never, frequently). Finally, say how you feel about them.
What do you dislike about X?	First you say one or two things that you don't like, say how much or the degree that you don't like it, and say why you don't like it.

Table created by Tabitha Hart using Eloqi lesson materials. Published with the knowledge of the company identified by the pseudonym Eloqi.

came up, the system would automatically connect her/him with an Eloqi trainer. Together, the trainer and student would follow the prompts on their screens to proceed through the lesson that the student had chosen.

Each CEL lesson was structured around a fixed sequence of increasingly complex tasks and activities to teach the given formula. Because Eloqi desired a high degree of control over and consistency in the use of its proprietary learning materials, the company scripted all CEL lessons and also built the scripting into the UI. A typical CEL lesson opened with a very brief greeting before proceeding directly to pronunciation practice with the target vocabulary. This was followed by a series of short drills during which the student practiced building phrases and statements that could be used to answer the relevant CEL question type. Finally, the lesson transitioned into a “putting it all together” segment, during which the student practiced answering the target question in a slightly more conversational manner. For each of these CEL lesson segments, the UI presented the trainer with prompts on what to say and when to say it (Figure 2.1, a). While some of the prompts in the UI were open enough to allow trainers to select their own phrasing (“correct [the student],” “reformulate [the question],” “ensure the student understands”), many were fully scripted (“Now let’s practice answering the questions like in a real exam; your answers should last for forty seconds at the most”) and were intended to be read out word-for-word. When trainers recited lines or successfully led a student through a section, they clicked the corresponding prompt in the UI, causing the prompt and the section to “white out,” denoting comple-

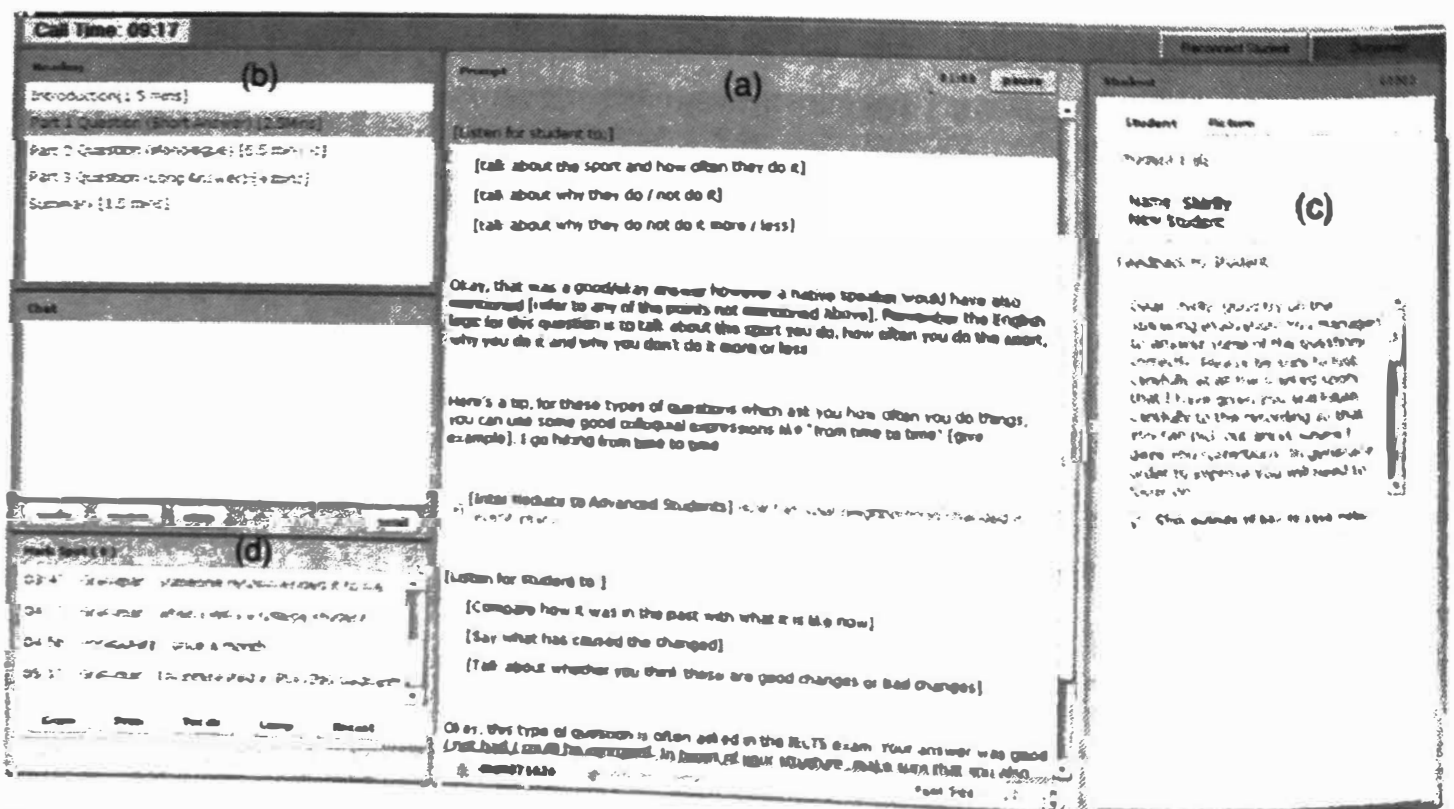


Figure 2.1. Eloqi lesson UI. Screen shot published with the knowledge and agreement of the company identified by the pseudonym Eloqi.

tion. This action was always recorded in the system and was visible to admins as well as any other trainers who subsequently worked with that student on that lesson. In this way the UI served as a visual tracking cue by which a viewer could quickly see evidence of how the trainer and student had progressed through the lesson.

Simultaneous to working through the prompts and the highly structured lesson plan, trainers had to carefully manage their time. Each segment had its own time limit (Figure 2.1, b) and the entire lesson could not run more than fifteen minutes. What's more, trainers were required to give a minimum number of corrections to each student, both orally and in writing. Personalized notes to each student were provided in a dedicated feedback box on the UI (Figure 2.1, c), while detailed written corrections to the student's speech were provided in a separate area of the screen (Figure 2.1, d).

During my participant observations I jotted down notes and took screen shots, and after each observation I wrote up field notes (Emerson, Fretz, and Shaw 1995). In addition to recordings of my own lessons, Eloqi also granted me unrestricted access to the company's master archive, which contained audio files and screen shots documenting every trainer-student interaction that occurred on the platform. From this archive I selectively transcribed and analyzed recordings that were relevant to the experiences, discussions, and activities of trainers and students. Ultimately I reviewed approximately 130 trainer-student recordings and transcribed about half of them. Finally, I conducted a series of interviews with Eloqi admins, trainers, and students. The aim of these interviews was to investigate points of interest that arose during my participant observation and ask interviewees about their perceptions and interpretations of the Eloqi experience. All of this material (notes, screen shots, field notes, trainer-student lesson transcriptions, interview transcriptions) became part of my dataset.

In preparing the original write-up for this study my goal was to identify the system of norms, premises, and rules guiding communicative conduct, that is, the *speech code* (Philipsen 1997; Philipsen, Coutu, and Covarrubias 2005), in Eloqi's community. This included the community's key values on personhood (what it meant to be a competent English speaker), relationships (how trainers and students connected with one another on a relational/interpersonal level), and rhetoric (what it meant to communicate with one another strategically), which I have reported on elsewhere (Hart 2016).

Meanwhile, as I was collecting and analyzing the data I discovered an intriguing subset of trainer-student interactions in which the lessons did not go as planned. I approached these interactions as speech events, or routinized speech activities "directly governed by rules or norms for the

use of speech" (Hymes 1972a, 56; cf. Saville-Troike 2003). From there, I applied Hymes's SPEAKING heuristic (Hymes 1962, 1972a) to analyze which, if any, of these communicative competence-related variables helped to explain what was happening. In so doing, I found the act sequence variable combined with the related concept of procedural knowledge to be very helpful in making sense of what was not working in these lessons. I now turn to an analysis of what this process yielded and an explication of how the concepts of act sequence and procedural knowledge shed light on why these interactions were problematic.

ANALYSIS

My discovery of these cases of problematic communication occurred in one of four ways: a flag in the system marked the case as problematic; a colleague reported issues to the community; I experienced the issues myself while teaching; or I came across a case while transcribing and analyzing trainer-student recordings. Most of the cases of problematic communication that I examined were associated with, or resulted in, the following conditions:

1. Early termination of an interaction by a trainer or a student. Each trainer-student interaction was required to run a minimum of twelve minutes. If a lesson ran significantly under this minimum, it was red flagged in the system as incomplete.
2. Directives by a trainer to a student to call HST (Eloqi's customer service team) for assistance. HST representatives were charged with interfacing directly with students to solve any problems that arose.
3. Reports by trainers to supervisors about problematic communication with a student. All trainers were required to "hang out" in the trainer chat room (Figure 2.2) while working. Beyond being a convivial space for passing the time in between lessons, the chat room was where trainers reported any issues with students. Whenever issues arose, trainers announced them in the chat room. The supervisor on duty in the chat room would then contact HST, and HST would in turn contact the student to bring the issue to resolution.
4. Technical issues that slowed or halted a lesson, or caused it to terminate, including audio/sound problems, the UI not responding properly, and other difficulties related to the technological aspects of the platform.
5. Markedly halted progress through a lesson. As previously mentioned, lessons were strictly timed, and the total lesson time had to fall between twelve and fifteen minutes.⁴ Each lesson was comprised

welcome to the chat room. You can see the
 currently in the room by looking at the right.
 Say "Hello" to everyone by just typing in the
 box below and hitting return.

Tabitha has entered the room

How easy it is will depend on
 the software you use to back it up. I
 have the worst luck with system
 restoration so I just back up data files
 which don't require any software to
 restore.

Oct 23 8:58 AM

Good morning Tabitha

I do the same thing.

Tabitha Good morning!

I tried Norton but it never quite gets is
 right.

Primary Trainer Chat Room

Welcome all
Trainers!

Who's here? [Leave](#)



[Upload a file](#)



Figure 2.2. Eloqi trainer chat room. Screen shot published with the knowledge and agreement of the company identified by the pseudonym Eloqi.

of a series of tasks and activities, and each of these in turn had an allotted number of minutes, meaning that the trainers had to maintain a pre-determined pace throughout the interaction. When I observed that a trainer was spending significantly longer than the allotted time on a given activity, I categorized it as markedly halted progress. Occasionally trainers reported this in the chat room.

6. Significant deviations from the standard Eloqi lesson script. As described earlier, all Eloqi lessons were heavily scripted and pre-planned. When I observed that a trainer-student interaction was straying from the lesson script in a significant and/or sustained manner, I categorized it as a script deviation.

In analyzing these cases, I found that the vast majority of them pertained to misunderstandings around the expected act sequence for trainer-student interactions. In other words, trainers and students experienced confusion about how to competently proceed through the lesson according to the local Eloqi lesson protocols. What's more, these cases could be sorted into four broad types of procedures, summarized in Table 2.3, each of which I will now describe.

Table 2.3. Procedure Types

<i>Procedure Type</i>	<i>Summary</i>
Lesson Initiation & Participation	How to initiate and participate in an Eloqi lesson; how to meet the expected conditions for participation.
Navigation/UI	How to navigate and use features of the Eloqi UI within the context of a live lesson with an Eloqi trainer.
Task/Activity Content	How to complete specialized CEL tasks and activities, as per the task/activity design.
Troubleshooting the Technology	How to handle technical problems that arise during a live Eloqi lesson.

Data collection and table creation by Tabitha Hart.

LESSON INITIATION AND PARTICIPATION: HOW TO TAKE PART IN AN ELOQI LESSON

The most fundamental requirement for participating in an Eloqi lesson was to be seated at a computer. Technically speaking, students could have connected to the Eloqi platform via landlines or cell phones, and could use these devices to speak with trainers; however, it was a long-standing company policy that all participants connect via Eloqi's specially built UI in order for a lesson to go forward. If this condition wasn't met, the trainers had to terminate the lesson immediately, as in Excerpt 2.1. In it the student (Xia) appears to be unfamiliar with this fundamental condition for participating in a live Eloqi lesson when she reveals that her computer is closed (0:56). The trainer responds by clarifying the expected procedure (1:03) before terminating the lesson, consistent with company protocols. To emphasize, this particular lesson was terminated because the student didn't follow the expected act sequence for accessing an Eloqi trainer, that is, connect to the Eloqi platform via a computer, have the UI open before queuing for the next available trainer, refer to the material on the UI during the lesson with the trainer, etc.

Another crucial procedure for participating in an Eloqi lesson was following the pre-determined lesson plan to the letter. All trainers, no matter their tenure or level of expertise, were required to closely follow the CEL scripts and prompts, as well as the sequence of CEL activities and the allotted time for each. For their part the students were expected to compliantly follow the trainers' cues. From time to time I observed lessons in which students attempted to go off script but, unsurprisingly, trainers generally rebuffed these conversational moves. In Excerpt 2.2 we see just

Excerpt 2.1: You Need to be at a Computer

Amy	Hi. Welcome to LQ English. My name is Amy and I will be your trainer for this session. How are you today, Xia?	0:00
	(..)	
	Hello Xia?	
	(.)	
	Can you hear me?	
	(...)	
	Hello Xia?	
Xia	Hello, hello?	
Amy	Hello, can you hear me?	0:27
Xia	Yes I can.	0:29
Amy	OK, great. Well, welcome to LQ English, and my name is Amy. How are you doing today?	0:32 0:33
Xia	Ah, it's fine uh=	
Amy	Good.	0:41
Xia	=(right) now.	0:43
Amy	Good. Well, this morning we are going to do a speaking evaluation and to use LQ English you need a computer. So are you in front of a computer?	0:44 0:45
Xia	(.)	
	O::h actually not, no ah, I have just closed my computer.	0:56
Amy	OK ↓ well, you need the com- ah, you need the computer uh, on to do this evaluation, so maybe please give us a call once again when you are at your computer and have it on and ready to go. So, if you have any questions though, you can, ah, call our High Scoring Team and I hope to speak with you, though, sometime. OK?	1:03
Xia	OK ↓	1:26
Amy	Alright, goodbye.	1:27
Xia	Mm goodbye . . . hhh	1:28

such a situation, in which a trainer (Iris) connects with a student (Winson) who requests unstructured conversation.

In the interaction presented in Excerpt 2.2, Winson goes against Eloqi's procedures for participating in a lesson in three ways. First, he reveals that he has not, in fact, connected via the Eloqi UI (0:42) and isn't prepared to follow along on his screen. Second, he has not strategically chosen a CEL lesson to work on, as indicated by his confusion about what lesson he should presumably be doing with Iris right now (1:23–1:56). As paying subscribers, Eloqi students had access to the entire CEL series, the idea being to progress through all the formulas at their own convenience. Students therefore selected which lessons they wanted to do when, and

Excerpt 2.2: I Think We Can Just Talk without the Computer

Iris	Thank you for calling Eloqi English. My name is Iris and I will be your trainer for this session. What's your name?	0:00
Winson	You can- you can call me Winson.	0:09
Iris	OK Winson. How are you doing today?	0:13
Winson	Fine. How are you?	0:16
Iris	I am well. Thank you very much. Um, it looks like we are going to be answering what do you dislike about X type questions today. So let's start by reviewing your pronunciation, alright?	0:18
Winson	OK.	0:32
Iris	OK. You should see a task card on your screen, Winson, I would like you to read the words on it out loud for me, please.	0:33
Winson	A:h but ah, I could not ah see the content on the co— on the screen.	0:42
Iris	OK.	0:48
Winson	Something-	0:49
Iris	=are you having difficulty with your Internet or what's going on?	0:49
Winson	(.) Ah, I think, ah ((clears throat)) I think we can just uh talk, ah, without, ah, the computer-	0:55
Iris	No: I- I'm sorry-	1:02
Winson	(with) the computer (with) the network	1:04
Iris	Yeah, no, I'm sorry, at Eloqi we- we have to work with- with the computer, so you'll need to get your Internet working and then you'll have to call us back.	1:05
Winson	A:h please hold on. Let me try.	1:16
Iris	OK.	1:22
Winson	Ah (..) So could you tell me the name of this lesson?	1:23
Iris	Um, actually you're- you've selected a lesson o:n answering what do you dislike about X type questions. (..) I- I didn't select the lesson- you did. (..) Do you want to get on the Internet and, and go through the lesson first before you talk with us?	1:30
Winson	Ah (..) Let me try again.	1:56
Iris	M'kay. Well, because our interactions are timed, Winson, I'm going to have to let you go until you can get that up and running. So, you do that and then give us a call back. OK?	2:02
Winson	OK uh	2:15
Iris	OK. Thank you.	2:16
Winson	Thanks.	2:19
Iris	Buh-bye.	2:21
Winson	Bye. Bye.	2:22

agreed to do the preparatory activities before connecting with the trainers for live sessions. When Winson admits that he doesn't know what lesson he has selected, he reveals that he has not followed the expected act sequence for engaging in a live lesson with an Eloqi trainer. Finally, in what the trainer reads as the most serious procedural violation, Winson suggests "just talk[ing] without the computer," that is, having a free conversation. The trainer rejects this suggestion, referencing the sanctioned conditions ("we have to work with the computer") as a means of explanation. A few moments later, she takes the decision to end the interaction, again citing expected procedure for doing a lesson properly ("have your computer up and running").

I was working a shift when Iris's lesson with Winson occurred, and I was present in the chat room when she reported this problematic interaction to the supervisor on duty. The other trainers present responded with amusement, as illustrated in Excerpt 2.3.

The surprised and mirthful responses by Iris's supervisor and colleagues revealed the seriousness of this particular procedural breach. Following the lesson scripts was such standard procedure that the trainers could not believe a student would suggest "just chat[ting]." Regardless of Winson's intentions, his actions did not follow the sanctioned procedure for connecting with and participating in an Eloqi lesson, and for these reasons the lesson was terminated and the interaction was marked as failed.

Excerpt 2.3: I Think He Has the Wrong 800# lol

Iris	Disco* with Winson. Said he wasn't on computer and couldn't l	01
	just chat with him. I explained that he needs computer.	02
Supervisor	lol** . . . ok, I informed HST.	03
Daisy	lol @ 'chat with him'	04
Reena	Iris: ROFL*** re: Winson	05
Supervisor	Winson called HST to find out if he could chat with a trainer	06
	without going through a lesson!!!	07
Daisy	Lol	08
Supervisor	they have updated him!!	09
Reena	NUH-UH ROFL	10
Supervisor	Lol	11
Daisy	Does Winson need a friend?	12
Supervisor	lol I think that's a first!!	13
Reena	I think he has the wrong 800#**** lol	14
Daisy	Lol	15

* Disconnect

* Lauging out loud

** Rolling on the floor laughing

****A reference to toll-free phone numbers starting with the digits 1-800.

NAVIGATION: HOW TO NAVIGATE THE ELOQI UI

As I myself discovered when I worked as an Eloqi trainer, competently participating in the lessons required close attention to numerous details presented on the UI, many of them time-sensitive. Eloqi's proprietary UI was constantly being tweaked, refined, and updated in response to trainer feedback and in support of the company's long-term technical and business plans. The technical team regularly introduced new tools and features while the manager of the trainer team and the content developer instructed the trainers in the corresponding policies, guidelines, and tips for their use. The trainers used the in-house forum to actively discuss the effective use of the UI, covering popular topics like how to use hot keys to type up feedback faster.

Perhaps unsurprisingly, given the complexity of the UI, one class of problematic trainer-student communication pertained to procedures for using the Eloqi UI effectively during lessons. In Excerpt 2.4 for example, we see a trainer (Carly) struggling to teach a student (Jacqueline) how to utilize the chat window feature.

Here the trainer attempts to teach the student a new vocabulary word, "specific," by typing it into the chat window where the student will be able to see it. The trainer's repeated efforts to direct the student's attention to the chat window (11:59, 12:08, 12:21, 12:33, 12:41) combined with the student's perplexed responses and silences indicate the student's momentary confusion about what the chat window is and how it should be used in this context. A full two minutes elapse until the trainer and student establish that they are both looking at the same thing on the UI (13:47) and by this time the interaction is nearing the maximum time of fifteen minutes. The trainer briefly explains the procedure for using the chat window (13:56, 14:12) but shortly thereafter begins to recite the closing statements before ending the call, thereby staying within the time limit for the lesson.

Excerpt 2.4 illustrates how Eloqi trainer-student interactions could stall when either participant—but most commonly the student—was unfamiliar with the features of the UI and/or the procedures for using them during a live interaction. Regardless of the underlying reason for the confusion (terminology, being a novice user, language barriers, etc.), not knowing the procedure for using a UI feature could slow down or even bring the lesson to a halt. Furthermore, because of the strict time limit for these lessons (fifteen minutes), slowed or halted progression through the lesson was a serious problem for both parties.

Excerpt 2.4: Do You See the Chat Window?

Carly	U:m, do you know the word "specific"? I'm going to put it in the chat window. Specific.	11:46
Jacqueline	Spe-ci-city hhh . . .	11:55
Carly	Do- yeah, so, Ja-	11:57
Jacqueline	(sorry)	11:58
Carly	Jacqueline, do you see the chat window on the left hand side?	11:59
Jacqueline	Hat window?	12:06
Carly	Yeah. Do you see the chat window on the left of your screen?	12:08
Jacqueline	(.) Sorry I hhh . . .	12:18
Carly	That- that's OK, that's OK. On the left side of the screen there is a chat window (.) and I'm ty-	12:21
Jacqueline	Uh, chat window.	12:32
Carly	Yeah, and I'm typing some words there.	12:33
Jacqueline	(.) Oh.	12:39
Carly	Uh, can you see the words?	12:41
Jacqueline	Uh, no.	12:44
Carly	You can't. Are you sitting by the computer?	12:47
Jacqueline	Yeah, I'm sitting in front of computer.	12:52
Carly	OK. And then do you see the- the screen? (..) Can you see the- the interaction screen?	12:57
Jacqueline	Inter ° (action scr)° (.) Ah=	13:09
Carly	OK, OK	13:14
Jacqueline	= Oh- oh- Oh. Sorry hhh . . .	13:15
Carly	OK. That's OK. Don't worry. Um, so when you use Eloqi, ah, we can talk to each other and we can send each other messages. So right now I am sending you a message. I'm typing a message. Can you see the message?	13:18
Jacqueline	(.) Uh, OK, I- Oh. I see that.	13:47
Carly	You <u>see</u> it?	13:54
Jacqueline	Yes.	13:55
Carly	OK, good. OK. So sometimes if there is a word that, that, um, I want to teach you, I can put it in this text message.	13:56
Jacqueline	(..) Oh.	14:11
Carly	Ah, so I put some vocabulary there for you.	14:12
Jacqueline	(.) Oh yeah.	14:19

TASK/ACTIVITY CONTENT: HOW TO PROCEED THROUGH AN ELOQI LESSON

Among the examples of problematic communication during trainer-student interactions, the most common type was that in which students misunderstood the act sequence for completing specific speaking tasks and activities. As previously mentioned, Eloqi had fixed lesson plans, not to be deviated from, and there was a pre-sequenced set of activities to complete during each fifteen-minute interaction. I found numerous cases of students not understanding the company's pre-determined procedure for the particular tasks at hand. For example, in Excerpt 2.5 the trainer (Daisy) and the student (Grace) are practicing the formula for answering the question type "How often do you do ~?" They have completed the pronunciation practice and now begin a section in which the student must utilize material listed on the task card (a visual prompt) to respond to the trainer's questions. The task card lists sample activities (eat Western food, swim in the sea, read books) and the following adverbs of frequency: *rarely, occasionally, frequently, every day, once in a blue moon, never, and almost never*.

In Excerpt 2.5, the trainer introduces the activity by way of reading the provided script (4:09), thereby calling attention to the standard Eloqi act sequence for this task:

1. The trainer (Daisy) will show the student the visual cue (task card), which lists activities and adverbs of frequency.
2. The trainer will pose questions to the student. Though the trainer doesn't explicitly say so in advance of the activity, all of the questions will be about the activities listed on the card.
3. After listening to each question, the student must provide an answer using one of the adverbs of frequency listed on the card. The student's answers should be one to two sentences long, and they should be accurate. (Later in the interaction the trainer adds that the answers must also be full sentences.)

Although the student's first answer does not incorporate any of the listed adverbs of frequency (5:06), the trainer does not correct her orally but rather proceeds on to the next question (5:18). Again the student answers with an adverb of frequency (*once a month*) that is not listed on the task card. After a long pause, the trainer reemphasizes the procedure and adds another stipulation: answers must be given in full sentences (5:49). What follows is a drawn out exchange during which the trainer repeatedly attempts to explain the procedure, giving explicit directives in six separate conversational turns. More than five minutes elapse before the student

Excerpt 2.5: Answer the Question Using the Adverbs of Frequency

Daisy	OK now let's practice the language you'll need to answer the IELTS type questions for this lesson.	4:02
Grace	(.) °OK°	4:08
Daisy	OK first let's look at the adverb of frequency. I will show you a task card with different activity- activities and adverbs of frequency. Please listen to my questions, and answer the questions with one or two short accurate sentences. OK?	4:09
Grace	OK. <i>((clears throat loudly))</i> (..)	4:26
Daisy	Do you see the task card?	4:35
Grace	(.) Ah yeah. I see. (..)	4:37
Daisy	OK, how often do you go out to sing kar(?) (. . .)	4:46
Grace	Ah pardon? (. .)	4:54
Daisy	How often do you go out to sing karaoke?	5:01
Grace	Um. Ah. I often, um, go out to sing karaoke, ah, (every weeks).	5:06
Daisy	(..) And how often do you eat Western food?	5:18
Grace	<i>((clears throat loudly)) mm uh usually mm I uh (let me see) uh, once a mo[↑]nth</i> (. . .)	5:25
Daisy	OK. Can you answer the questions using the information on the task card, please, in a full sentence?	5:49
Grace	Ah yeah, I see. (. . .)	5:56
Daisy	Gra:ce?	6:14
Grace	Ah yeah.	6:16
Daisy	How <u>often</u> do you <u>eat</u> Western <u>food</u> ?	6:19
Grace	Um:: Ah, to be honest I don't like, ah, eat Western food. Ah, ma:ybe several, ah, several months, ah, I, I, I go out, to, ah, eat Western food.	6:23
Daisy	(..) OK. So can you-	6:47
Grace	(Hello?) Oh. OK.	6:48
Daisy	How would you answer the question- how would you answer the question using the adverbs of frequency and the activities on your task card?	6:52
Grace	Um. (.) (. . .)	7:01
Daisy	Grace?	7:36
Grace	Ah, yeah. I'm here. (.) Hello?	7:38
Daisy	Do you- do you see the adverb of frequency?	7:44
Grace	(..) Of frequency.	7:48
Daisy	Are you looking at your task card?	7:52
Grace	Ah, yeah	7:55

(continued)

Excerpt 2.5. (continued)

Daisy	OK. I need you to answer how often do you eat Western food using the adverbs of frequency and activity on your task card, please.	7:57
Grace	Ah, so- can you- can you- u:m (.) I have- I have answer the question.	8:14
Daisy	That's not correct. I need you to use the information on the task card to properly answer the question.	8:24
Grace	O:h (..) I must use the words, um, left to right. (...)	8:34
Daisy	OK. I need you to use a full sentence and use the adverb of frequency and the activity on your student card to answer the question how often do you eat Western food.	8:47
Grace	Um. Hhh . . . °frequency° I- I eat Western food frequency.	9:04
Daisy	OK Grace, do you see the adverb of frequency list? Rarely, occasionally, frequently, everyda:y	9:17
Grace	every day	9:28
Daisy	Once in a blue moon, never, almost never. Do you see that list?	9:29
Grace	Ah. Ye:ah. I see.	9:35
Daisy	OK. I need you to use that list to answer the questions that I am asking you. So using a word from that list, tell me how often you eat Western food?	9:37
Grace	(.) Uh frequency. (...)	9:53
Daisy	OK. Do you eat Western food rarely, occasionally, frequently, every day, once in a blue moon, never, almost never. How often do you eat Western food?	10:08
Grace	Um: I eat Western food, ah, frequen(cy).	10:23
Daisy	Frequently.	10:29
Grace	Frequently.	10:30
Daisy	Frequently.	10:32
Grace	Frequently.	10:36
Daisy	OK. Now how often do you go swimming in the sea?	10:37
Grace	U:h (..) rarely.	10:45
Daisy	OK, and full sentence, please.	10:53
Grace	(.) I beg your pardon?	10:58
Daisy	I need you to answer these questions in a full sentence, please.	11:00
Grace	U:m I, I go swimming in the sea rarely uh because I- I have not enough time to go- uh to the sea.	11:07
Daisy	OK. So, I rarely go swimming in the sea.	11:24
Grace	(uh) rarely go swimming in the sea.	11:29
Daisy	Now how often do you do physical exercise?	11:33
Grace	Mm: ah I do physical exercise every day, ah, when I finish my ah cla- uh class (mostly) I- I always (run) to, mm playground and do some, mm, sports, ah, like jogging, um, mm..	11:39
Daisy	OK. So your answer, Grace, would simply be, I do physical exercise every day after class. OK?	12:06

Grace	OK.	
Daisy	Alright. So how often do you read novels?	12:16
Grace	(.) Uh, to be honest, ah, ah, almost never, um, because I think that, ah, reading is boring.	12:17
Daisy	(.) OK. So I almost-	12:24
Grace	(.)	12:42
Daisy	I almost never read novels because I think reading is boring.	
Grace	Yeah.	12:44
Daisy	(.) OK. Do you understand what I did with those?	12:49
Grace	Yes. I un (.)	12:53
Daisy	OK. Alright. Now I am going to show you another task card and ask you what you usually do at different times of the day. So we can work on the present tense and do a little bit more adverbs of frequency. OK?	12:58
		13:00

produces the desired type of answer at 11:07. Considering that five minutes is a full one-third of the allotted time for the lesson, this lengthy exchange in clarifying the activity procedure has cost significant resources.

TROUBLESHOOTING: HOW TO HANDLE TECHNICAL ISSUES DURING AN ELOQI LESSON

The final category of procedural issues in the data set pertained to handling technical issues that arose during the one-to-one sessions between trainers and students. The most common type of technical issue at Eloqi was sound problems. It was not uncommon to experience degradation in the audio (words sounding blurred or slurred, choppiness, sound dropping out altogether, etc.) caused by weaknesses in the Internet connection. Other sound problems like echoing (often caused by one or both speakers not wearing a headset), pronounced volume variation, and static were also par for the course. When sound issues became so troublesome that they caused significant disruption to the lesson, the trainers were permitted to terminate the call, ideally after directing the student to call HST for assistance. Finally, the trainers would report the technical issue to the supervisor on duty in the chat room.

In theory, the procedure for handling technical difficulties was straightforward, but in practice it often became muddled, as in Excerpt 2.6. In it, the trainer (Iris) is halfway through the lesson with the student (Lei) when she notices an echo on the line. Iris identifies the problem and attempts to troubleshoot it with the student. She calls the student's attention to the issue and issues a vague directive (7:43) followed by a clearer one (7:58). Over the following turns the trainer makes repeated references to the

problem but the student appears not to understand either the trainer's identification of the problem or her instructions about dealing with it. At 8:52 the trainer advances to the standard procedure for such cases, telling the student that they must end the call, and that the student should check in with HST. While we can't be sure if the student understands that the trainer is complaining about an echo, she does appear to be familiar with the standard procedure for disconnecting and calling HST, and indicates agreement to take these actions (9:10). However, at 9:25 the trainer finds that the echo has receded and changes the plan, offering to continue the lesson. Understandably, the student is puzzled about what should happen next (9:45 and 10:01) despite the trainer's prompting (9:43, 9:57). It takes several more turns for the trainer and student to arrive at a mutual understanding about carrying on with the lesson.

In this case, the act sequence for identifying a technical issue is arduous and unsuccessful, as there is no clear indication that the student has understood either the problem (echo) or the procedure for dealing with it (re/plug in the headset). The trainer's attempts to have the student resolve the technical issue prove to be fruitless as the steps followed by the trainer are—at least initially—unfamiliar to the student. It is only when the trainer falls back on the standard procedure for troubleshooting (end the interaction, call HST) that mutual understanding is reached, but this mutual understanding is upset when the trainer veers away from the agreed-upon procedure.

DISCUSSION

Despite Eloqi's attempts to systematize and control trainer-student communication by implementing a detailed lesson protocol, there were—perhaps inevitably—cases of problematic and sometimes failed communication. In analyzing these cases, I found the act sequence variable from Hymes's SPEAKING heuristic (Hymes 1964, 1972a) combined with the related construct of procedural knowledge to be very useful for understanding how and why this problematic communication between Eloqi trainers and students occurred. Through an EC-based analysis of the cases I was able to sort the problematic communication into the following four categories:

1. Initiation and participation procedures—how to take part in an Eloqi lesson
2. Navigation procedures—how to navigate the UI
3. Task procedures—how to proceed through a task or activity
4. Troubleshooting procedures—how to handle technical issues

Excerpt 2.6: Can You Get Rid of that Echo, Please?

Iris	Ok, so let's look at future ambition phrases, and here is the 3 steps. ((Her voice echoes in the background.))	07:35
Lei	Mmhm.	
Iris	Um, I ca- uh, right now Lei, I am hearing an echo of my voice. Can you get rid of that echo, please?	07:42
Lei	Uh, s- sorry, could you uh- could you speaking? One time?	07:43
Iris	Lei, I am hearing an echo of my voice and I can't hear you clearly. Are you using um, a headset, and if you are, could you plug it in, please?	07:53
Lei	My phone is not- is unclear?	07:58
Iris	There's an <u>echo</u> =	08:11
Lei	Echo.	08:15
Iris	=I hear my voice, and your voice.	08:17
Lei	O::h. No, I listen clearly.	08:18
Iris	Ok well that's great, but I am not able to listen clearly.	08:22
Lei	Ok.	08:27
Iris	Are you using your computer or are you using a telephone?	08:33
Lei	No, I don't- I don't use the telephone.	08:34
Iris	Ok, so I need you to plug in your headset, so I don't hear the echo.	08:38
Lei	Oh- OK.	08:42
Iris	Ok.	08:51
	((voice continues to echo))	08:52
	Ok, I am still hearing that echo. Lei, I am going to ask that you call our high scoring team and have them troubleshoot an echo sound with you. Ok?	
Lei	Ok.	09:04
Iris	Call them and tell them 'my trainer said that there is an echo, can you help me?' ((echoing sound seems to recede))	09:05
Lei	Oh, uh ye- (now) I can hear you. I:- I will- mm I can () the () on the (Skype) with the LQ English high (scoring) team.	09:10
Iris	Alright, I- I don't know what you just said but the echo has gone away so let's take a look at the future ambition phrases on your screen. If the echo comes back, I am going to hang up the call and you're going to call HST for help, OK?	09:25
Lei	Ok.	09:42
Iris	Ok. Can you see the card on your screen?	09:43
Lei	Uh, just a moment. (.)	09:45
	Yeah, I can see.	
Iris	Ok:: go ahead and begi↑n. .	09:57
Lei	Ok. (..)	10:01
	(I will) call the high (circum) team phone number.	
Iris	(.) Um, if you want to call high scoring team, I am going to have to disconnect our ca↓ll or you can try the card that's in front of you=	10:18
Lei	OK	
Iris	=Did you wanna go ahead and do the exercise?	10:26
Lei	Yeah, I:: I hope- I hope to continue to (stay) uh continue to talking with you.	10:28
Iris	Ok well then go ahead and do the exercise that's on your computer screen.	10:39

Here I will discuss the larger implications of these findings, focusing on their relation to UX and interaction design.

UIs are a means not only of presenting information, options, and activities to the users, but also of organizing information, options, and activities. In this way they are implicated in users' interpretational, sense-making, and decision-making processes (Beer 2008; Gane and Beer 2008; Manovich 2001, 2003). In Eloqi's case, the design of the UI lays out a very deliberate procedure for trainer-student communication, and it directly guides users through the lessons in the manner determined by the organization to be valid. The UI prompts trainers and students on what speech acts (greeting, asking, telling, saying, giving information, correcting, checking, clarifying, challenging, clicking, directing, saying goodbye, etc.) to perform in what sequence, and for what length of time. These prompts simultaneously demonstrate what counts as legitimate communication for these speakers (Eloqi trainers and students) in this context (live Eloqi lesson). Through the force of the community's agreed-upon rules (follow the scripts, stay within the time limits) the UI curtails the options for speech. In these ways, the UI actually encodes Eloqi's expectations for competent communicative behaviors during a live English lesson.

Encoding Eloqi's UI with cues for competent communication was not accidental. On the contrary, it was precisely the intention of Eloqi's engineers who, in concert with the company's visionaries, designed an approach to online communication training that they felt was scalable and amenable to mass reproduction without significant variation or loss of quality. The success of this design rested in large part on shared understandings of *procedure*, that is, a set of explicit, sequenced communicative acts which, when performed according to local expectations, comprised competent behavior during a live Eloqi lesson. Eloqi was able to make some of its locally required procedures visible in the UI, but for other procedures it took time, training, and practice for them to become intuitive. In other words, these procedures were not sufficiently encoded to allow for maximum agency, as defined by Murray (2012) earlier in this chapter.

People develop procedural knowledge over time, through socialization, experience, and repetition. We enter into communication situations, technology-mediated or otherwise, with cognitive scripts already in mind (Shoemaker 1996). Simultaneously, we test and adjust those scripts in our moment-to-moment interactions, storing our developing procedural knowledge for future reference and use. As we experience new situations we recall this knowledge and use it accordingly as we interpret and respond to communicative situations (Gioia and Poole 1984). Over time novices learn locally expected procedures and can intuitively or automatically engage in the communication at hand (Cameron 2000a, 2008, 2000b).

Learning the procedure for a communicative activity is thus a work in progress.

This process of learning the procedure for a technology-mediated communicative activity must be of special interest to UX designers, who can benefit from exploring how users draw on extant procedural knowledge pertaining to routine tasks to make sense of new technology-mediated spaces in which they are engaging in novel activities (Sternberg 2009; cf. Boellstorff 2008; Kendall 2002). Indeed, as I learned while conducting this research at Eloqi, all of the trainers and students had experience in teaching and/or learning, all had spent some part of their lives participating in their country's formal education system. They must have used their knowledge of engaging in traditional (offline) learning settings as they navigated Eloqi's virtual learning community and engaged in the company's unique teaching and learning activities. What gave this process special urgency in the Eloqi community were the constraints that the company built into the interaction design, particularly the strict time limits placed on the trainers and students throughout their interactions. Because of this, sustained misunderstandings about the expected procedures were costly to Eloqi's members and potentially wasted a limited resource: time. For these reasons, it was critical that Eloqi's users pick up the locally expected procedures as quickly as possible.

Taken as a whole, it makes sense in all phases of the design process to highlight the concepts of act sequence and procedural knowledge; doing so draws our attention to the "what happens now and what happens next" components of technology-mediated interactions from both the design and use perspectives. The procedures and act sequences designed for a UI must adequately fit the needs and goals of the organizations commissioning the UI, the boots-on-the-ground service providers or representatives, the clients, and the affordances and constraints of the technological platform itself. Technological interfaces are "culturally defined, which means that generally, the social meaning of an interface is not always developed when the technology is first created but usually comes later, when it is finally embedded in social practices" (de Souza e Silva 2006, 261–262). Because of this, it is beneficial to examine local notions of act sequence and procedural knowledge not only at the start of the design process, but throughout the life cycle (design, creation, launch, use, redesign, ongoing use) of the build.

NOTES

1. **Publisher's Note:** The screen shots, references, and information pertaining to the company identified by the pseudonym Eloqi is published with the company's

knowledge and agreement that the screen shots, references, and information would be used in a later publication. Likewise, the interviews used as supplemental research in this text were all conducted with the participants' knowledge and agreement that these interviews would be used in a later publication.

2. Pseudonyms have been applied to the company and all of its members (admins, trainers, students) in order to protect their privacy.

3. Consider how expert we can be at using the grammar of our native language while not being able to explain it to a non-native speaker.

4. Going over the fifteen-minute limit was cause for reprimand, and if a trainer repeatedly failed to stay within the time constraints, they could be dismissed.

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