# The Discourse of Collaboration in Instructional Design

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Co-Design
Collaborative Design
design decisions
Design discourse
discourse analysis
Instructional Design
professional designers

*We examined collaboration via the discourse of Instructional Designers (IDs) actively engaged in co-design. Discourse is language-in-use within a specific community as opposed to abstract notions of how words might fall together by more general rules of grammar and semantics. An analysis of discourse in a community of practice is a direct observation of the meaning-making process employed by members of that community. We collected and analyzed five audio recordings from Collaborative Project Meetings (CPM) among teams of IDs and clients to determine the types of design expertise that comprised the discourse of collaboration. Several findings from this study shed light on how instructional design benefits from*

*collaborative strategies such as co-design. The content analysis revealed that the most prominent type of design discourse used by IDs was problem-solving, followed closely by discourse surrounding tools, and user experience; however other dynamics, such as gender balance and the presence of multiple instructional designers correlated with differences in instructional solutions.*

# Introduction

Collaboration is ubiquitous in the field of Instructional Design and Technology (IDT). In the book *The Job*, Ellen Ruppel Shell argues that relationships and collaboration make life meaningful in modern work (2018). Collaborations are realized in discourse; thus, understanding the granular content of exchanges provides a window through which we can access how meaning is made (Gee, 2014). From the perspective of IDT managers and practitioners, good collaboration is the most valuable skill a designer can have (Howard & Benedicks, 2019). These ideas led us to our study.

Previous studies have called for a closer inspection of the language of collaboration in IDT (Boling & Gray, 2015; Gibbons, 2013). However, a close inspection of practitioner language has been overshadowed by larger debates. Such debates include a paradigm shift from a deterministic view of the process model to a more nuanced view of the designer, including one where the designer employs precedent as the driving force behind the act of designing (Boling & Gray 2018) or another view where the designer functions iteratively in situ, through reflections-in-action processes (Tracey, Baaki, Bidhrani, & Shah, 2021). These approaches are more thematic and global, whereas discourse analysis is more granular and emerges not thematically, but from a set of previously studied expertise-based discourses (Bevins & Howard, 2020).

We investigated professional instructional designers (IDs) working at a large research-one (R1) university who were actively engaged in co-design with clients and other IDs. To understand how these instructional designers made meaning through their collaborations, we collected client-ID recordings and analyzed the discourse that emerged. We wanted a specific IDT lens to view the discourse, as opposed to a grounded theory approach which might be overly customized to the specific design tasks, so we employed a previously published taxonomy of design discourse that had been tailored to IDT discursive practices (Howard & Bevins, 2020). We transcribed, scrubbed and coded the sample according to the types of discourses in the taxonomy. The juxtaposition of discourses between the two speaker roles (client discourse versus designer discourse) illuminated how the designers

were making meaning in their practice. Some long-held beliefs in IDT were confirmed with empirical evidence, and in other cases, findings suggested new paths to design solutions. We also investigated these interactions by gender and found evidence supporting mixed-gender teams. The study design combined lenses from previous literature in design, IDT, and discourse analysis.

# Literature Review

While the lay press may make claims concerning the value of collaboration, and that it is increasing in the broader workplace (Shell, 2018), we looked to the literature within the design disciplines, and instructional design specifically, to guide our study and analysis of language in use among practicing designers. In support of this perspective were voices criticizing the commonly accepted conception of how ID work is accomplished and calling for studies that examine actual practice (Boling & Gray, 2018; Gibbons, 2013; Gray et al., 2015: Rowland, 1992).

Collaboration in IDT has been approached primarily from lenses concerned with the efficacy of design solutions and the future success of IDs. Studies have focused on the effectiveness of collaboration between IDs and faculty members (Olesova & Campbell, 2019; Richardson et al., 2019), on the communication and relationship-building skills necessary to excel in an IDT position in higher education (Ritzhaupt & Kumar, 2015), and on what it is IDs really do (Kumar & Ritzhaupt, 2017). However, none of these studies closely examined how those processes are manifested in designers' talk during design collaborations.

Voices calling for the study of actual practice make a special note of how language in use might provide insight into valuable aspects of ID. Gibbons (2013) posited that anyone working in a certain profession in collaboration with others develops over time a language or vocabulary that is used in that context, but he stopped short of making any claims about what that language entails. Gibbons' (2013) perspective still aligned with others (Boling & Gray, 2018; Gray et al., 2015; Rowland, 1992) who also advocated for empirically grounded studies focusing on language in use and referenced a starting point outside of IDT.

The notion that designers develop unique communications regarding their work was established in multiple fields of research over the past four decades. Dorst (2015) argues that there is an advanced beginner stage where a facility with the unique linguistic routines of design emerges. Scholars refer to these types of advanced language-in-use as a Discourse (Gee, 2014). Schön identifies discourse competencies in design, designers "learn to detect multiple references, distinguish particular meanings in context, and use multiple references as an aid to vision across design domains" (1983, p. 98). This language of design connects professional IDs to their work (Dong, 2009). Design discourse is also an external representation of design expertise, and an externalization of design thinking (Cross, 1982). Through this design language, designers are able to both acquire expertise and represent the expertise they have acquired. In other words, a Discourse, in Gee's (2014) terms, facilitates collaboration in design. Language-in-use holds a foundational position in the design process. Furthermore, design discourses influence and advance the field, "As design languages evolve and we become fluent in using them, the result is advances in design sophistication, effectiveness, productivity, and quality of designs" (Gibbons & Rogers,

2009, p. 306). Design discourses are a shared community that has theoretical and practical foundations and help evolve our practice of design (Gibbons & Rogers, 2009).

Bevins and Howard (2020) operationalized the term design discourse using literature drawn from linguistics, design, and IDT with the specific aim of disambiguating some of the terms. The term Discourse emphasizes the language-in-use aspect of communications and helps us distinguish between unique abilities to express oneself regarding designs for learning and the typical notions of grammar and vocabulary that make up lay understandings of language (Gee & Handford, 2012). The growth of terminology is notable in the literature. In many cases, such as Gibbons and Rogers (2009) and Dong (2009), the authors used the term language bounded by how the language is used, thus language-in-use. Language-in-use is the definition of discourse, and it includes both the what and the how of talk among members of a certain group. The group establishes practices of communication, and these could include gestures, unspoken rules, assumptions, and ways of interpreting the communications of others. Design discourse, then, refers to all the communications that surround real acts of designing (Bevins & Howard, 2020). Conversations that happen in professional design spaces are "full of references which in turn point to huge chunks of information" (Lawson, 2004, p. 445). By examining design discourse, scholars in IDT can grasp the nature of design and how expertise is negotiated (Lawson, 2004). In the field of IDT, Gibbons and Rogers (2009) refer to this design discourse as design languages, and define these as communications "centered in tools, processes, technologies, theories, or best practices of a domain" (p. 23). Design Discourse offers a glimpse into the expertise and inherent communicative practices in instructional design collaboration.

An adjacent term that we found in the literature that seems to be addressing a similar aspect of collaboration is linguistic routines. As in all professions, design professions have their own linguistic routines that can be examined to better understand the design process (Dannels, 2005; Gibbons, 2013). The field of IDT lacks a formal operationalized definition design language. Neither Dannels (2005) nor Gibbons (2013) listed what these routines actually are. Gibbons (2013) addresses that shortcoming directly. "[The field of IDT] has failed to develop a robust theoretical vocabulary for discussing designs and the act of designing" (Gibbons, 2013, p. 151). We concluded from our review of the literature that from an examination of design discourse in collaborations, the field of IDT can advance recognition and understanding of the design language used by professional IDs. If we know what design discourse in IDT is, then we can identify it, teach it, and develop it. All of this research we encountered, and our study as well, employs a theoretical frame that assumes design is embodied in language-in-use.

The literature surrounding design expertise was the basis for the taxonomy of our code book. Research on the process of design, including studies in IDT itself, has recognized nine unique types of design expertise (Bevins & Howard, 2020). These nine design expertise types are problem solving, problem framing, precedent, usability, user experience, aesthetics, external representations, tools, and design tensions. We provide supporting literature for each of these design expertise areas in Appendix A.

# Theoretical Frame

We assumed a theoretical frame that believes professional practice is embodied in discourse. This perspective values examining the discourse of IDs to better understand the instructional design collaborative process and views the transparency of discourse to be more reliable than self-reports. “Our conjecture is that design partially subsists in language; the substrate is the language of design” (Dong, 2009, p. viii). Direct examination of a designer’s thinking is impossible. Even if we had interviewed designers to find out what discursive practices they used, it would not be as reliable evidence as actual discourse from practice. Therefore, in order to understand how designers make meaning in collaborations, we studied their language-in-use. Design discourse in turn helps us understand the foundation of the discipline at a fine-grain level as those foundations actually manifest in practice.

Instructional designs are realized through collaboration. These collaborations could consist of ID-ID conversations, ID-client conversations, or a combination of both. The conversations that teams have surrounding a project are an important part of the design process (Lawson, 2005). Design is not a set of directions to follow but rather a negotiated experience. “Language use is an embodied phenomenon. The ability to use language entails the ability to articulate, listen, learn, and conceptualize experiences, including feelings” (Krippendorff, 2006, p. 152). Our theoretical frame assumes that these abilities become observable in the design discourse of a designer at work.

Discourse analysis is the methodological toolkit used to study language-in-use, in this case, discourse as the embodiment of design expertise. Discourse analysis uncovers how people make meaning (Dunn & Neumann, 2016). “Language (in use) produces a common sense that anchors designers and their work to a body of knowledge and practice” (Dong, 2009, p. viii). Shared understanding of the IDT concepts, ways of thinking, strategizing, and moving towards solutions among IDs’, and IDs and clients, allows designers to recognize members and non-members of the discourse community and participate in it (Krippendorff, 2006). A discourse analysis of the language of designers in active collaboration with other designers and with clients describes IDT through the lens of language-in-use. To be clear, we did not approach the data with a view of how collaboration should take place, or how we might imagine it does. Rather, this theoretical frame used discourse analysis procedures to guide the analysis, resulting in this overarching question: What areas of design expertise comprised the discourse of collaboration when IDs met with clients?

# Purpose of the Study

We examined the types of design expertise found in instructional design collaborations to better understand how different strategies emerge in different roles. In these collaborations, there were two different speaker roles - ID and client. These collaborations disclose how meaning is made and how solutions are found in the collaborative process between IDs and clients. The language-in-use from design collaborations offered unique empirical value as a window into how collaboration actually takes place in instructional design. The following section explains the methodological process we followed to select, collect, and analyze the content of design discourse among designers and clients.

# Methods

## Study Context

Collaborative Project Meetings (CPMs) were part of an Office of Instructional Technology (OIT) initiative at a large research one university in the Southeastern United States. The program was created to help instructors design and develop new online courses. Instructors were the clients and each was assigned a lead ID, and sometimes a secondary ID, who assisted them with the development of online materials and teaching strategies. This study contained no other roles in the discussion besides ID and client. This program consisted of four different stages of development 1) asynchronous online training via Canvas, 2) in-person meetings between the faculty member and the assigned ID(s) to work on course development, 3) a quality assurance check before implementing the developed course, and 4) the course implementation. Our data was drawn from meetings in stage 2 of the program, the in-person meetings. We audio-recorded five different meetings.

The client and one or two assigned IDs participated in each of these design deliberations for course development. All five meetings included at least one ID and one client, though some meetings included two or more IDs. All five meetings were initial face-to-face meetings; that is to say, none were follow-up meetings. At this stage in the project, the clients had completed their asynchronous online training and had been given a few initial course development tasks, i.e. design a syllabus, create the course schedule, and rethink assignments and assessments.

## Participants

There were 11 total participants in this study. There were six IDs (3 females and 3 males) and five clients (2 females and 3 males). The IDs were all full-time employees in a professional ID capacity, and the clients were all faculty at the university. All IDs had formal instructional design training at the graduate level in Instructional Technology. All participants signed a university approved Institutional Review Board (IRB) informed consent form agreeing to participate in the study. The breakdown of the participants by each meeting can be seen in Table 1. Three IDs appeared in more than one meeting.

**Table 1**

*Makeup of the meeting participants by number, role and gender, summing in total to unique individuals 11 participants in 14 different instances.*

| Meeting | Number of IDs present | Number of clients present | Gender of IDs | Gender of clients |
|---|---|---|---|---|
| Meeting 1 | 1 | 1 | F | F |
| Meeting 2 | 3 | 1 | 2 M, 1 F | M |

| Meeting | Number of IDs present | Number of clients present | Gender of IDs | Gender of clients |
|---|---|---|---|---|
| Meeting 3 | 2 | 1 | 2 M | M |
| Meeting 4 | 1 | 1 | F | M |
| Meeting 5 | 2 | 1 | 2 F | F |

This was a purposive sample of convenience. The director of the OIT had shown support for the study and promoted it, which may have inspired a willingness to participate. The administration provided an opportunity to collect signed informed consent forms prior to the data collection period. We anonymized the corpus of interactions (data) prior to coding, retaining roles, timestamps, and other important information.

# Development of the Codebook and Applied Analytical Procedures

After the recordings were transcribed into spreadsheet software and scrubbed, we began an iterative development process of customizing a codebook. We built this customized codebook starting from a previously published taxonomy of design discourse in ID (Bevins & Howard, 2020). Design expertise describes both the design constructs that scholars say are an integral part of the design process and the different skill levels of IDs. We operationalized these external representations of design expertise by coding the design concepts and constructs that designers used.

As a starting point, we coded discursive turns by substance (Howard, 2012) first, slicing turns into new segments, often referred to as utterances, when the speaker changed, or the content of the speaker's interaction changed. The initial codebook consisted of nine content areas of design discourse. In this iterative process, we determined that discourse management was so prevalent that we should count that separately. We developed a second set of additional codes that ensured word count statistics accurately represented mutually exclusive codes. We reasoned that discourse management turns were distinct from other categories and might comprise strategies of their own. Table 2 provides the substantive codes as well as the discourse management categories, with definitions and examples. We provide these examples and definitions so that the reader can appreciate the flavor of the data, the slight differences between discourse management and the enactment of design expertise, and potentially replicate the study elsewhere which we believe might prove useful.

**Table 2**

*The codebook showing mutually exclusive codes of two different kinds: Codes of design expertise drawn from the literature and operationalized in the context of this study, and*

*codes of discourse management (denoted by*). Examples are drawn directly from the sample.*

| Design Discourse | Definition | Example |
|---|---|---|
| Tools | Discourse regarding the tool employed in the design process. | “And then I put the cursor down here. And I click on more external tools, just like in the module, and I choose studio.” |
| Design Tensions | Discourse surrounding issues related to the vision of the project, the initial focus, the project limitations or competing constraints, or the consequences of the designed product. | “or you're not going to be able to pull that together by Friday, then just don't worry about that.” |
| Problem Framing | Discourse surrounding how the designers see or view the problem or that identifies the subject of the design as an example of a specific design genre. | “Um, but because we're looking at instead of a graduate class an undergraduate class” |
| Problem Solving | Discourse surrounding the establishment of the problem or a comparative analysis of multiple design solutions; characterized by hypothetical and conditional statements. A gambit. | “I've got about seven main assignments in the way I teach it face to face, I may change that to five or combine the six and seven, so five or six in the summer just for ease.” |
| Precedent | Discourse about a previous experience both as a designer or a user. | “which I have. Well, actually, I haven't, I change peer reviewers in my other online course, and they just do one group project.” |
| Aesthetics | Discourse surrounding the holistic experience of the design (the emotional, physical, and/or spiritual experience of the designed product. | |
| User Experience | Discourse surrounding what the user sees, hears, and does while using the designed product. | “It looks really nice. It'd be a nice nice asset. The intro video is also really important.” |

| Design Discourse | Definition | Example |
|---|---|---|
| Usability | Discourse surrounding the usability of the designed product, including problems or positive aspects of using the designed product. | "We want to empower the students to know what they're doing without you having to get involved with, you know, a bunch of emails through the week and so forth. That annoys everybody. So that will be that's really the advantage of having nice and clean structure. They can take over and they know what to do." |
| External Representations | Discourse about sketches, written notes, pictures – anything that represents the design. | |
| Inquiry* | Discussion used to elicit information from the other speaker (could be in question or statement form) | "And it's your preference to do a five week versus a full?"<br><br>Potential miscodes: "Okay. And this was the one where you were talking about, you had asked me about whether to go with four groups of five, or five groups of four?" |
| Procedural* | Discourse surrounding procedural, logistical, or organizational tasks related to the design project. | "We can review of the canvas jumpstart and kind of kind of see where where you have completed things where you haven't." |
| Backchannel* | Discourse intended to convey the interest and/or comprehension of the listener (Yngve, 1970). | "Yeah, okay, mmhmm, right." |
| Positive reaction* | Discourse intended to convey a positive reaction of the listener to the idea expressed by the speaker. | "Oh yeah, that sounds good." |
| Tangential* | Discourse not about the current project but somehow related to the current project. | "if you can get the screen to come on. I couldn't get it to come on the other day." |
| Off topic* | Discourse that is off topic and is not associated with the project or anything tangential to the project. | "Have you seen frozen 2" |

| Design Discourse | Definition | Example |
|---|---|---|
| Null* | Discourse that is incomprehensible and does not relate to a previous utterance. | "If you" |

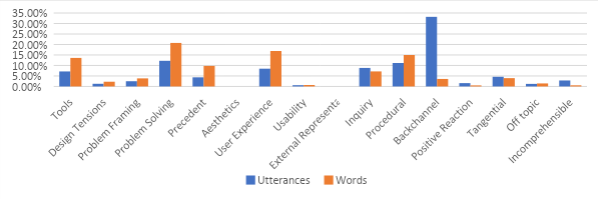
The six additional codes for discourse management strategies were not in the initial codebook from Bevins and Howard (2020) because that taxonomy was not developed from a corpus of discourse, but rather from research literature. We reasoned design discussions, like all real-world discussions, require discourse management strategies to enable a discussion to take place intelligibly. For example, backchanneling is a way for interlocutors to show they are listening (Yngve, 1970). These discourse management strategies are not part of design expertise, but they are important to recognize because strategies differ among contexts (Howard, 2012). We had 16 total codes in our final codebook.

# Results

To begin, we calculated the total number of utterances and words by discourse code. There were a total of 2,244 utterances in the sample. Inter-rater agreement on substance codes applied to utterances was at 82%. Figure 1 shows the normalized total utterances and total words per discourse code of IDs and clients combined. These calculations were completed to better understand the discursive behavior in the discussions as a whole. Backchannel (Yngve, 1970) was the most common and accounted for a third of the total number of utterances. Backchannel, however, is discourse management used by the listener to indicate they are listening and understand what the speaker is saying. These short utterances typically consist of only one or two words, such as Okay or Yeah. Backchannels facilitate discussion but do not represent design expertise in discussion. For this reason, we decided to report the results of discourse types in words instead of utterances, because it more accurately represents the discursive action in these design meetings (Howard, Barrett, & Frick, 2010).

**Figure 1**

*The normalized total utterances and total words per discourse type showing that backchannel had the most utterances of any discourse type and that problem solving had the most words of any discourse type.*



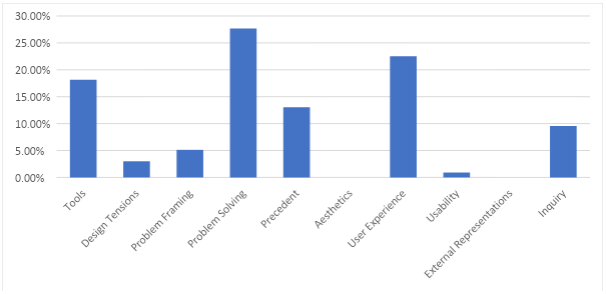
Problem solving took up the largest part of the discussions, accounting for 20% of the total of all words in the data. Backchannel occupied the most utterances, but only accounted for 3.5% of the total amount of words. The next three most common discourse codes were User experience, Procedural, and Tools, accounting for 17%, 15%, and 13.6% respectively. We next divided the design discourse types from the discourse management strategies. Design discourse made up 75% of the total words in these design discussions, and discourse management strategies accounted for the other 25% of the total words. From this result, we can see that IDs and clients in these meetings spent 75% of their discourse effort in areas of design expertise about the project and 25% of their time managing how each discussion would take place.

# The prevalence of different areas of Design Expertise

Our primary analytical procedure focused on the design expertise found in the corpus. We found eight of the ten design discourse codes from our finalized codebook in the design meetings between IDs and clients (Figure 2). In this study, we found that IDs and clients spent over a fourth (27.66%) of their design discourse on problem-solving. Problem-solving is a focus on the establishment of the problem or on the hypothetical solutions that could be used to solve the problem (Cross, 1982; Lawson & Dorst, 2009). The second most prominent design discourse type was user experience (22.54%) followed by discussions about tools (18.14%). Discussions surrounding precedent accounted for 13% of the design discourse. Problem framing, design tensions, and usability accounted for less than 5% each of the design expertise codes of discourse. In this study, we did not find examples of discourse surrounding aesthetics or references to external representations in these design discussions despite these areas of expertise being discussed in the literature. Figure 2 depicts design discourse codes in words to show the relative discursive effort devoted to each type of expertise.

**Figure 2**

*Normalized total words by design discourse, showing problem-solving accounted for the most words among all design discourse in the sample and aesthetics and external representations were absent in the sample.*

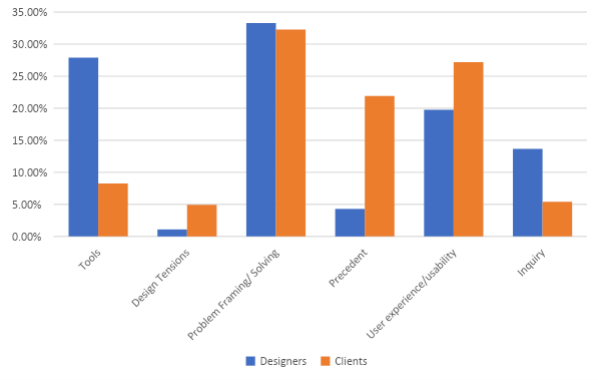



# Design Discourse by Role

We also calculated the design discourse frequencies by speaker role to better understand design discourse. For purposes of this study, there was only one of two possible roles for each speaker, either ID or client, regardless of rank in their respective job description. This is the only case where we aggregated two areas of design expertise, usability/user experience and problem solving/problem framing, due to our difficulty reliably disambiguating these areas of expertise apart from each other when it came to the two roles. Clients rarely use the terms, but often referred to their learners' smooth experience of the instructional design or to the main problem along with solutions they had already contemplated, and we felt calculating separately would artificially present a difference which in fact contained no discernible meaning. While both clients and IDs most frequently spent their discursive effort on problem solving, clients spent more time than IDs on discussions regarding design tensions, precedent, and user experience (see Figure 3). In contrast to clients' discourse spent on design tensions, precedent, and user experience, IDs spent their words on discourse surrounding tools, user experience, and asking questions (inquiry). Note again that this frequency is calculated by total words, not the number of times these areas of design expertise were called into discursive action. This analytical procedure foregrounds more complex discourse because turns are longer among some discourse codes (such as problem solving) as shown in Figure 1. Figure 3 graphically juxtaposes the six design discourse codes' word counts between IDs and clients, allowing the viewer to better visualize where the two roles diverged in their collaborative design strategies.

**Figure 3**

*Normalized percentages of design discourse categories showing the differences between the ID and the client role.*



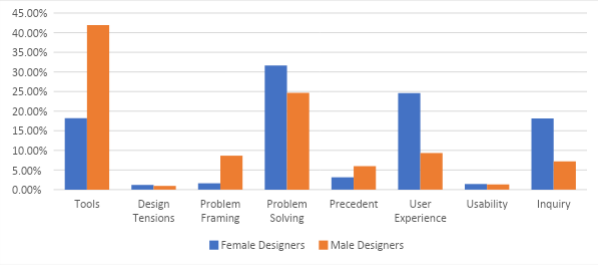

In both speaking roles, the most frequent and least frequent codes were shared. However, the relative difference in words devoted to the divergent codes is curious. The two roles differed most prominently in the discourse surrounding tools, where IDs far outweighed clients by more than three times as much. Thereafter clients far outweighed IDs in words devoted to precedent or the retelling of previous design experiences, again by more than three times as much. IDs devoted more than twice as much of their discourse to asking questions (inquiry) than clients did.

# Design Discourse by Gender

We conducted an unplanned additional analysis of the design discourse of IDs by gender due to noticeable trends in the data. After noticing clear differences in word count measures devoted to different design expertise, we reasoned that a perspective that accounted for gender might bring about a richer discussion. Figure 4 shows the design discourse of male and female IDs and how each gender employed different design expertise in their discourse.

**Figure 4**

*Percentages total words of design discourse showing the differences between female and male IDs design solution strategies.*




Male IDs primarily focused on design solutions incorporating tools, and female IDs primarily focused their discussion on problem solving. Problem solving, tools, and user experience were the three design discourse types that were the most prominent in the discourse for both female IDs and male IDs. However, these three design discourses ranked differently by the gender of the designer. Female IDs focused the majority of their discursive time in design discourse on problem solving, user experience, and tools, respectively. Male IDs focused the majority of their discursive time in design discourse on tools, problem solving, and user experience, respectively. These results suggest that male and female IDs focused on similar design expertise but at different discursive efforts.

# Discussion

## What areas of design expertise comprised the discourse of collaboration when IDs met with clients?

The following seven areas of design expertise were present in every collaboration and comprised discussion in the following descending order of prominence: *(1) Problem-Solving (27.6%), (2) User Experience (25.4%), (3) Tools (18.1%), (4) Precedent (13.1%), (5) Inquiry (9.6%), (6) Problem Framing (5.1%), and (7) Design Tensions (3%).*

We found eight of the ten possible types of design discourse in these collaborations between IDs and clients. This evidence is consistent with the IDT literature and suggests not only that design discourse is integral to the act of design, but is also part of the collaboration process as well (Boling, 2010; Clark, 1994; Cross, 1982; Cross, 2011; Dorst, 2015; Lawson & Dorst, 2009; Norman, 2013; Oxman, 1994; Schön, 1983; Schön, 1987; Tatar, 2007; ). Seven of

the eight design discourse areas that were found in the data suggest that these discourse areas embodied the majority of the act of design collaboration for both IDs and clients.

*Problem solving* was the most prominent design discourse type for both designers (33%) and clients (32%). Jonassen (2000; 2008) has advocated for a long time that problem-solving is at the center of instructional design. The results from our study add further evidence to his claims. Problem-solving consists of discourse surrounding the establishment of the problem or surrounding a comparative analysis of multiple design solutions. In the five design meetings in our study, both clients and IDs were focused on the problem of changing a face-to-face course to an online course and on the complications that arose during their initial design process. They were focused on solutions to those problems, as Jonassen (2000; 2008) argued instructional designers always do. This finding also aligns with Rowland's (1992) finding that IDs spent extended time analyzing the problem and considering solutions to the problem. This finding suggests that problem-solving plays a central role in IDT collaboration. The percentage of words devoted to problem-solving may also suggest that problem-solving may in fact be more than just one area of design expertise, as other studies have broken the exploration of solutions into gambits, reframing, and justifying design moves in hypothetical terms (Howard & Gray 2015).

While we focused most of our analysis on the areas of design expertise, we also note that a discourse management code was in fact the most common, backchannel. It does beg us to consider the role listening plays in design discourse. If the most common turn is to tell the other that one is listening, listening may in fact be a discourse skill of unique importance to the act of collaboration. We do not typically teach learners how to listen to clients, but experienced managers of IDs, and advanced IDs, have put forward the notion that better designers can hear clients' needs (Howard & Benedicts, 2019). We would be remiss not to mention just how significant this finding might have been.

# The language-in-use of designer vs. clients

IDs and clients shared the range of design discourse but in different measures. IDs primarily focused on *problem-solving, tools,* and *user experience*, in that order of prominence. Clients on the other hand measured *user experience, problem-solving,* and *precedent*. These differences suggest that in design collaborations, IDs and clients bring dissimilar foci to the early phases of the design process. While both roles emphasized problem-solving, how that problem-solving manifested itself in their solution exploration depended on the role. We interpreted these results to evidence a dynamic to the collaborations. While a client sees the experience of the design from the user's perspective, such as a lot of attention paid to precedent, the ID offers affordances of the tools or searches the user experience to generate instructional solutions.

# Gender's impact on design solutions

The disparity of design expertise discourse (beyond problem-solving) between males and females suggests that collaboration is a process where the agency of the designer has a real impact on the design. This focus on the agency of the designer is becoming progressively more recognized as we see studies emerge where the agency of the designer is foregrounded, such as in Lachheb and Boling's (2018) study that asked designers what

tools they use and why. Gender dynamics was not an initial target of inquiry in our study but emerged from the data. The differences force us to question assumptions as we move from notions that the design model drives the design to other ways of imagining how designs come into being through collaboration. As a field of study, we have a long history of recognizing ill-structured problems, but our corpus of interactions begs the question that maybe solutions are not entirely determined by the problem per se, but rather by the discussions' trajectories and what the participant IDs bring to the table. This supports the notion that IDs create the problem frame; it does not just appear to them.

There is also a temptation here to engender design solutions. We can interpret the prevalence of the discourse surrounding tools by male IDs to suggest a male-gendered perspective on problem-solving. By the same token a focus on users to engender female solutions. Being aware that discourses could generate such notions could make us more aware of contexts where gender assumptions could lead us down unfruitful paths. Awareness of the potential of stereotypical assumptions combined with an awareness that mixing genders might in fact support ID teams to make the most of what all designers bring to collaboration, may avoid excessively labeling anyone, or any solution.

In the end, taken as a whole, the results here suggest that more design solutions will emerge from mixed-gender ID teams. Design firms may find utility in this insight. The gender analysis suggested a wider array of solutions would emerge from the discourse of both female and male IDs on the same team. Female IDs primarily focused on problem-solving and user experience, and male IDs focused on tools and problem-solving. These results imply that, when able to, forming mixed-gender collaborative teams will have more access to a broader range of design solutions. These data imply that gender variety enhances collaboration and makes accessible more design solutions than would otherwise emerge.

# The Complexity of Usability

*Usability* was the one problematic discourse area because it appeared in only two meetings but was also remarkably similar in content to User Experience. This prompted us to aggregate the two codes for one analytical procedure– the comparison of the design discourse between the roles of ID and client. We reasoned that the close alignment of usability and user experience may suggest that the differences in the literature on this aspect of design expertise may be influenced by design discipline, project genre, or even speaking role. In a more general sense, two areas of expertise may actually be one skill emerging differently in design discussions simply based on stakeholder positioning. Usability was the least frequent design discourse in these collaborations. Of the eight design discourse areas that we found in the data, usability only accounted for 0.91% of the words devoted to design discourse. This finding is consistent with the Bevins and Howard (2020) study that found very little discourse surrounding usability despite its prominence in the literature of IDT.

We might expect to see discussions surrounding usability more towards the end of a project. Usability involves the user discovering how to use a designed product (Norman, 2013). To determine the usability of a product, we would need a prototype of the designed product. This study consisted of design meetings in the beginning stages of a design project, which is why we may have found little discourse surrounding the usability of a product. We

interpret these findings to suggest that discourse surrounding usability may appear in design collaborations that are in the end phases of a project.

Usability may also be a design expertise that is not as prominent in IDT collaborations as in the other fields of design which spawned some of the literature we reviewed. Usability consists of the intuitiveness of a designed product for the user (Norman, 2013). The examples discussed in Norman's book revolve around physical objects, such as door handles, chairs, etc. Most design projects in IDT are not tangible, physical objects, but instead consist of lesson plans, learning objects, websites, classes, programs, or any number of things that cannot be physically manipulated by the user. Typically, designed products in IDT have to be accessed via a tool of some kind, i.e. a computer, a tablet, a phone, etc. In other fields of design, understanding of how to use the designed product is squarely placed on the designer, whereas in IDT, there is an assumption that the user must put forth effort in learning how to use the design. Since the data reflects relatively low frequencies of this discourse, it may in fact be that IDs do not habitually rank usability as high as other design goals. These data point to the conclusion that user experience and usability are one and the same in IDT collaborations, albeit from different speaking roles, and less frequent than we might hope.

# Data suggested essential skills in design collaboration

These results may suggest that there are essentials to design collaboration that are worthy of more attention. There were three design types that accounted for a combined 54% of the design discourse. Those were *user experience* (22.54%), *tools* (18.14%), and *precedent* (13.06%). These findings suggest that after problem-solving, IDs and clients were next focused on the users, tools, and past experiences. Looking out for the user experience and usability, the tools needed to create and implement a design, and the prior experiences of both IDs and clients may bring your standard problem-solving ID to 99% of the expertise in IDT collaborations. These three design discourses together held approximately equal discursive frequency in collaboration in IDT to problem-solving and four areas together may be the baseline for ID collaborative competency.

By the same token, the less frequent discourse areas might suggest more advanced skills. Alternatively, more difficult design problems may elicit more advanced skills in collaboration. The infrequency of discussion about Design tensions in these collaborations suggests that certain types of design discourse may be prominent at different phases in a design project, but also may appear only when trying to solve unique design problems. The discourse surrounding design tensions did not play a central role in these design collaborations, accounting for only three percent of the design discourse. This contradicts other studies of design collaborations among undergraduate students in a design studio (Bevins & Howard, 2020). In that study, the discourse surrounding design tensions was the second most frequently found in the data set.  Differences in phases of the design projects, designer skills, or difficulty of the design problem remain plausible explanations for the disparate frequencies but also beg further investigation. In Bevins and Howard (2020), the project was in the beta stage of the design project, and in the present study, the design project was at the beginning. Different stages in the design process may favor one design discourse over

another, or it may be that design skill dramatically impacts the types of expertise employed in solving problems.

## Design Discourse that did not appear

The absence of discussions involving attention given to *Aesthetics* and *Reference to external representations* suggests that these design discourse areas are uncommon or rare in IDT collaboration, at least at this stage in the design process or at this level of expertise. There could be many reasons for a lack of evidence of discussions surrounding *Aesthetics or Reference to external representations;* however, other studies have documented that these areas of design discourse are particularly difficult to communicate for early designers (Howard & Bevins, 2020). Two studies in the IDT literature found examples of discourse surrounding aesthetics (Howard & Bevins, 2020) and external representations (Howard & Gray, 2015), though these studies did not examine practicing, authentic instructional designers. These studies were observing later phases of the design process suggesting that these two design discourse types may not be part of the collaboration in IDT in the early phases of a project.

# Implications

This study illuminates how professional IDs and their clients make meaning via collaboration around design projects. These results invoke opportunities to grow our understanding of collaboration in design, and in the design process itself through these verbalized patterns of discourse. At the same time, the real utility may lie in the potential growth of our own instructional designs educating early designers, and optimizing the design expertise of design teams to access a greater range of solutions. Much of this revolves around supporting problem-solving and developing an understanding of how the other forms of design discourse aid in developing that skill set.

## The prominence of Problem-Solving as an act of design

This study implies that the design process is to a large extent the act of problem solving. Problem-solving was the most frequent type of design expertise found in the data. The implication here is that the establishment of the design problem is the most prominent design act, as suggested by Jonassen (2000; 2008). To further understand the role of problem-solving in the design process, it may be necessary to investigate if there are different types of problem-solving, as suggested by Jonassen (2008), in different phases of the design process or in different types of design projects.

## Training early designers

Exercises in problem-solving, tools exploration, user inquiry, and the review of past designs (design precedent) may be the most direct path to ID collaborative competency. Problem-solving was the most prominent type of design discourse found in the data. Providing exercises and opportunities for students to establish design problems (Jonassen 2000,

2008), discuss potential solutions, and deal with complications that arise from those solutions may be the essential ID curriculum. A nuanced understanding of how collaborations function may aid ID educators. An awareness of the value to tools and the potential of exploring the user experience might make time spent in these areas more transparent and pedagogically valuable.

An awareness that tool knowledge is the second most common solution strategy might be helpful in preparing students for the professional realm. IDs in this study spent over a fourth of their discursive time on discussions surrounding tools, implying that the practice of IDT is tied to the use and discussion of technological tools. Aligning this result with that of Bevins and Howard (2020) that undergraduate students actively working on a design project spent 42.5% of their discursive time talking about tools further suggests that time spent on discussions about tools in IDT training programs will further designers' access to solutions. Providing space and time for the exploration of tools in IDT programs will prepare students for design practice in collaboration with others.

The final implication in terms of training early designers promotes that IDT programs need to have a broader and more extensive focus on the needs of the users. User experience was the second most prominent type of design discourse found in the data. If we combine this finding with the methodological struggles that we had concerning *usablity's* relationship with user experience, this point is even stronger. IDs devoted 18%, and clients devoted 26%, of their discursive time to discussions surrounding the needs of the users. Training IDs to consider the needs and experiences of the users will help them to prepare for design collaborations with fellow IDs and more specifically with clients.

# Limitations

The shortcomings of this study align with any qualitative data handled in a such quantitative manner. Results are not generalizable because of the small sample size of the participants involved. In this study, we examined the design discourse of six IDs in practice. Further examination of a larger sample of IDs would be needed in order to generalize this data to the larger population of IDs. We also focused on IDs in the context of higher education. Examining IDs in other fields, i.e. business and industry or K-12 education, would also be useful in order to determine if these areas of design expertise are also prominent in discussions in other IDT contexts.

Another limitation of this study is the phase of the design project where this data was collected. All five discussions that were audio-recorded and analyzed were at the beginning stages of the design project. Some of the differences found in the results between this study and other similar studies (Bevins & Howard, 2020; Howard & Gray, 2015) may result from the differences in the phases of the design projects. Examination of similar conversations between IDs and clients in the same program in a later phase of the design project may find different areas of design expertise that are more prominent at that point in the project.

Clients are not trained designers, so conclusions drawn from their discourse speak not to expertise in design, but to client discourse only. The five discussions that we audio-recorded and analyzed were ID-client conversations. This is a limitation because these two speaker roles do not belong to the same communities of expertise, and clients would, therefore, not

be versed in the language of the community of IDT. This would result in an abridged form of design discourse, because the language of IDs is being accommodated for the client. Therefore, IDs are not going into the full form of their expertise as a designer. The full form of their expertise would appear in conversations with other IDs who are well-versed in the language of design.

We also did not distinguish these conversations between ID-ID conversations and ID-client conversations. Of the five meetings, there were three meetings where more than one ID was present. This means that there could have been exchanges between just the IDs and then between one (or more) ID and the client. We did not analyze the data according to these exchanges. It could be that if we separate out the ID-ID conversations from the ID-client conversations, the type of design discourse that is evident would be different depending on the role of the other participant in the conversation.

# Future Research

This study could lead to several areas of future research. In looking at the results of this study, two of the major findings could lend themselves to further investigation. Seventy-five percent of the design discourse found in these discussions centered on discourse about problems, users, and tools. Further investigation into design discourse, and especially in other phases of a design project, could provide a more nuanced understanding of the types of design expertise employed by IDs throughout the whole design process.

In this study, we also found that male and female IDs focused on different types of design expertise in their discussions with clients. Further investigation of the differences between genders could provide more insight into the unique areas of design expertise that male and female IDs bring to the table. Examining design discourse from a gender perspective could also provide insight into how these types of design discussions progress and how the collective expertise of IDT can be built.

One area of research that would further this study is to examine conversations that distinguish between ID-ID conversations versus ID-client conversations. In order to participate in the professional community of IDT, IDs must show their understanding of the IDT concepts, ways of thinking, strategizing, and moving towards solutions through their discourse (Krippendorff, 2008). It could be that IDs would tend toward certain design expertise when collaborating with other IDs versus when collaborating with clients, who do not belong to the IDT professional community. Examination of these two distinct types of conversations could provide further information about how IDs collaborate with others in similar and differing roles.

# Conclusion

This study endeavored to connect the literature of IDT and the other fields of design to empirical evidence of practicing designers' language in use to better understand IDT collaboration. It was not grounded theory and not unbiased. Rather, the study relied heavily on previous research in both discourse analysis and design. Studies in this field must build on each other if we are to bring the field progressively in line with other professional fields of

design. This study provided empirical evidence that the expertise of IDs is expressed via discourse surrounding problem-solving, technological tools, and the user experience, that listening is 25% of the ID skill set, and that mixed-gender teams may offer access to a broader range of learning solutions. The ultimate hope of this research trajectory is to enable a precise understanding of IDT expertise so that eventually the professional IDT practitioner will become a recognized entity.

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# Appendix A

## Unique professional discourses found in the literature

Problem-solving is the act of both establishing a problem and finding solutions to that problem. The very nature of design is to solve a problem of some kind. Lawson and Dorst (2009) refer to design problem-solving as the process of posing a problem, searching for solutions, exploring the consequences of these solutions, evaluating the consequences, and then choosing which solution fits best. In the field of IDT, the most prominent examination of problem-solving was via the creation of a typology of the types of problems IDs might encounter (Jonassen, 2000). This typology can help IDs address how to deal with the problems they may face in generating frames and solutions. This focus on problem solving will help us in "developing elaborate, multiple representations of problems along with learning to regulate different kinds of problem performance" (Jonassen, 2000, p. 82). Explicitly teaching students how to deal with different types of problems can help strengthen this skill of problem-solving.

Problem framing is how IDs view, see, or approach the problem they are faced with. Schön (1983) saw problem framing as viewing the problem or situation in a particular way. Problem framing is imposing our own constructs on a problem in order to better understand and find a solution to the problem. Dorst (2015) defines a problem frame as "the proposal through which, by applying a particular pattern of relationships, we can create a desired outcome" (p. 53). Problem framing is how a designer approaches the process of problem solving (Dorst, 2015). How a designer sees a problem determines the design solutions available to the designer. Problem framing is the beginning step in the problem-solving process.

Precedent in design is when a designer uses knowledge of a previous design to help frame or make decisions on a current design project (Oxman, 1994). The act of collecting precedent knowledge is not realized as such until that knowledge is used (Lawson, 2004). Once a designer uses a prior experience to help solve a current design problem, it becomes precedent knowledge. Precedent is "a recognized, specific design in which the unique

conceptual points and ideas are denoted as distinct knowledge chunks" (Oxman, 1994, p. 142). Designers store and use these knowledge chunks in future design projects that they believe share similar characteristics as prior experiences.

Usability refers to whether or not a product is usable. How to use a product should be inherent in an object that has been designed. An example used by Norman (2013) is that of a door. A door should intuitively tell us how to use it. If we are to push a door to open it, then a metal plate should be placed on the side where we should push. If we are to pull a door to open it, then a handle should be placed on the side we are to pull. Usability for Norman (2013) is the discoverability and the understanding that should be inherent in every designed product.

User experience refers to how the user of the product experiences that product. The user of a designed product is one of the most important aspects of design. How the user experiences the product defines the quality of that product. For Norman (2013) "experience is critical, for it determines how fondly people remember their interactions" (p. 10). User experience is now often referred to as UX design (Buley, 2013). In general, the user experience of a product refers to "the overall effect created by the interactions and perceptions that someone has when using a product or service" (Buley, 2013, p. 5). Considering how a user interacts with and perceives a designed product is a type of design expertise that is essential to the design process.

In the field of IDT, the experience of the user has been described as empathy for the learner and the aesthetics of a design (Parrish, 2006; 2009). The ability to see a product through a user's perspective has been noted as one of the most critical skills in IDT (Parrish, 2006). Through empathy for the learner, an ID is able to understand how a designed product would be experienced. The aesthetics of a design include empathy for the learner in considering the holistic and meaningful qualities of a learning experience. Through an evaluation of these aspects, IDs are able to improve the instructional design. Aesthetics, then, pushes past the surface qualities of a design (Was it easy to navigate? Was the user able to find everything they needed? Was it pretty?) to consider the engaging, meaningful, and immersive aspects of a design.

External representations are the sketches, illustrations, and text explanations by which designers work. Schön (1983) refers to external representations as design representations. Design representations are the drawings and sketches that are created during the design process. These representations allow the designers to visualize the solutions they are working on. Cross (2011) sees these external representations as a way to deal with the complexity of the design process. There is a limit to the complexity that a designer can struggle with internally. External representations help designers to deal with that complexity.

A tool could be a software program the designers were using to work on/complete their design or a specific feature of a particular tool. Tools could include learning management systems (Canvas, Blackboard, etc.), third party publishing platforms (Cengage WebAssign, MindTap, etc.) and other software programs to help in creating materials for online classes (Captivate, Microsoft Word, Microsoft PowerPoint, Quicktime, Zoom, etc.) Tools play a large role in the design process. Tools in IDT are both a means of creating instruction and also delivering instruction (Clark, 1994). The conversation surrounding tools in design has

centered around whether media influences learning (Clark, 1994; Kozma, 1994). Clark (1994) argues that tools are not integral to the design process; instead it is the instructional method employed that is the most important. Kozma (1994), however, argues that both tools and methods should be used equally in the design process as how they work together is what drives the design process and the learning that happens with the designed instruction.

In the design process, there are constraints and tensions that can arise that can end up driving the design process. Design tensions can be explained via a framework developed by Tatar (2007). This framework focuses on four levels of design tensions, which includes the tension inherent in the vision of the design project, i.e. the tension between what is and what ought to be, the tension inherent in the way the designer approaches the design problem, the project tensions where there are conflicts via the means, ways, and values to complete the project, and the “as created” tension from the consequences that arises from the new designed product. Design tensions in a project could fall under any of these levels and can affect the design decisions made by the ID.