Judgment and Instructional Design: How ID Practitioners Work In Practice

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In this study, we address the relative lack of rigorous research on instructional design (ID) practice via an exploratory study in which pairs of researchers observed design judgments made by eight practicing instructional designers in two consulting environments as they went about their normal work activities. In our analysis, we sought to characterize their practice on its own terms, rather than through superimposition of existing ID models or frameworks. A nonprescriptive, philosophical framework of design judgment by Nelson and Stolterman (2012) was operationalized and used to frame two phases of analysis: identifying and coding design judgments and creating holistic summaries of the observed practice. We found that design judgments occur quite frequently throughout design, often in clustered or layered ways, rather than in "pure" forms. These judgments appeared to be shaped by factors unique to the firm, the role or position of the designer, and project, client, or other external factors.

A shift is happening gradually in the field of instructional design and technology (IDT)—from viewing design as a matter of following prescriptive theories and models to considering design as practice and process in the same manner that other design disciplines do (e.g., architecture, graphic design, engineering design). A few decades ago, questions began to be asked in the field regarding design process, design practice, how instructional designers design, and what they actually do in practice (e.g., Perez & Emery, 1995; Rowland, 1992; Wedman & Tessmer, 1993), but no major shift in the direction of these questions can be discerned. Over a decade later, in reviewing the foundational textbooks and published definitions in the field, Smith and Boling (2009) identified the lack of focus on design practice in the literature, including designers' roles and judgment in design processes. In parallel, other authors were addressing the nature of design as it is understood in this field (Buchanan et al., 2013; Parrish, 2005; Rowland, 1996). A consequence of this shift in viewpoint is that views of designing from other fields in which design occurs are expanding the view within this field to include constructs like design judgment (Korkmaz & Boling, 2014; Nelson & Stolterman, 2000, 2012).

Even with this shift to a more comprehensive, expansive view of design, our understanding of instructional design (ID) practice as one specific manifestation of design remains limited. Rowland's rigorous study in 1992 was remarkable, not the least because he attempted to understand

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practice on its own terms. While this was a promising start, a general lack of core understanding in the field as a whole about how design is actually done has resulted in a number of attempts by researchers (Sugar, 2014) to explain the complexity of practice with limited success.

Review of Literature

Views of Design in the Field

One approach has been to study practice based on how it conforms to existing ID theories or models. In Wedman and Tessmer (1993), 11 pre-identified ID activities were presented to instructional designers, who responded with how often these were used, whether or not they were used in their prescribed order, and whether or not they were all completed to the same degree. Noting that rarely do designers use most of these activities, and not always in order, Wedman and Tessmer proposed the layers of necessity model, later revisited by Winer and Vásquez-Abad (1995), which encouraged designers to input their needs into a base model for each unique situation. When ID practitioners began to move from a cognitive to a more constructivist approach, Kirschner, Carr, van Merriënboer, and Sloep (2002) began describing how ID models were becoming more of an inspiration for designers, and less a prescribed set of rules. The focus on how designers prioritize activities introduced by these authors, and the sense of temporal awareness that came with these ideas, also led to the Cox and Osguthorpe (2003) study of how ID practitioners use their time. The focus of this study was moving away from *what* instructional designers do and toward *how* they incorporate other aspects of designing, such as time management and task prioritization. Following these studies, Visscher-Voerman and Gustafson (2004) and Christensen and Osguthorpe (2004) turned back to the question of how designers interact with prescribed models, theories, and methods they had been taught. Both studies came to the conclusion that homogenous design methods were not widely practiced by instructional designers, but that a more adaptable, diverse, and heterogeneous approach is typically followed. Several of these efforts have led to the development of new models for designing, presumably reflecting better in their conception what designers actually do, but ultimately *prescribing* what they should do in an effort to ensure that following the model will produce optimal practice—an approach antithetical to broader views of design (Boling & Gray, 2015; Lawson & Dorst, 2009; Stolterman, 2008).

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Understanding Design Practice Through Models

Any number of ID models exist, arguably similar enough to each other that they are, at a high level, indistinguishable. As recently as 2009, Branch has explained that the well-known, simple, ADDIE model of design (analysis, design, development, implementation, and evaluation) can be applied in any situation where instruction is the appropriate response to a performance gap.

Traditional instructional models have been criticized for failing to capture or address the complexity of design (Reigeluth, 2013). However, even though it seems that ID models represent a single linear process, Verstegen, Barnard, and Pilot (2006) state that instructional designers must consider different kinds of constraints and limitations to respond appropriately to the contexts in which they work. In other words, instructional designers should make decisions based on the constraints in their particular settings (Gibbons, Boling, & Smith, 2014; Schwier, Campbell, & Kenny, 2007) rather than just following the steps of a model (Branch & Kopcha, 2014). Spector (2012) also emphasizes that communication and interaction between the key stakeholders takes a great deal of effort during the design of instructional materials, a factor not included in ID models (e.g., Morrison, Ross, Kalman, & Kemp, 2011).

All of these attempts to approach the complexity of design practice still take as their starting point an activity-centric model of designing, modified in one dimension or another, but still lacking any fundamental awareness of how designers use their professional knowledge to make situated judgments about anything except a choice of instructional strategy and *modifications to the model*.

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A Broader Understanding of Design

Attempts have been made to make sense of design practice more expansively by drawing on design theory and research inside and outside of our field. Some studies, such as Bichelmeyer, Boling, and Gibbons (2006), look at proposing ways of thinking about what we do as instructional designers to provide a new perspective and ask what might be holding designers back. Studies such as this imply that the goal should not be to teach a model to ID students, but that we should be focusing on developing what has recently been called a *cognitive flexibility* toward professional practice (Yanchar & Gabbitas, 2011). Other studies focus attention on the agency and unique characteristics of instructional designers, rather than on the models and theories they employ. Kenny, Zhang, Schwier, & Campbell (2005) observed that designers do not stick to the models they have learned, but also that they engage in many other

tasks not at all related to ID, illustrating how our view of ID shifts when we approach practice on its own terms. Still other authors argue that ID, in common with other forms of design, is characterized by fundamental ambiguity that contrasts with existing models and processes of ID—particularly those taught to students. They conclude that we have a need to understand more about, and adapt our thinking to include, understandings of design from other fields (Fortney & Yamagata-Lynch, 2013; Tracey & Boling, 2014).

These scholars are tapping into decades of research on design activity in the larger design community, several prominent examples of which are discussed here. Rowe (1987) started to look closely at the behaviors of designers by mapping a generalized portrait of how a designer thinks while working on a project. He described the internal logic that designers use while designing and explored the constraints and conditions influencing design. Lawson (1997) focused on how designers think in relation to their design practice, which changes and evolves with the technology around it. Lawson (1997) and Cross (2011) addressed studio learning, and how one learns to design through engagement, underscoring the importance of understanding authentic design practice. Much of this work was carried out in architecture and product design. In engineering design, Vinck (2009) used ethnographic approaches to study technology in design and claimed that knowledge about design cannot come only from the study of the *results* of an action, but by observing also what happens *during a decision* that brings about an action.

How Practical Knowledge Is Applied by Instructional Designers

Cross (2011) claims that everyone is capable of design, but that good designers must grow and develop to improve their skills and knowledge. He has examined not only the internal and external motivators of designers, but how designers work in teams, and what qualifies a designer as an expert. Robinson (2012) has looked at the satisfaction of designers and how this satisfaction is affected by where they spend their time designing. By looking at how much time a designer spends in technical or social situations while working, Robinson hopes to influence changes in work practices, suggestions for human resources in regards to key skill requirements, or even ways that this knowledge can optimize the roles designers occupy within organizations.

There has been a substantial focus for some time regarding what knowledge and skills novice designers should have. Novice designers should have knowledge of instructional models (Dick, 1996), but they should also have problem solving, communication, and management skills (Ertmer et al., 2008). Perez and Emery (1995) emphasize the importance of a process of design where expert designers take into consideration a number of factors, whereas novices may only rely on theory-based approaches. Furthermore, York and Ertmer (2011) found that instructional designers appeared to give more attention to the practice of ID models when designing. According to Ertmer, York, and Gedik (2009),

even though experienced designers also use ID models "to frame their thinking about design problems" (p. 23), they do not follow the processes outlined in the textbooks. The designers in this study stated that context and related constraints influenced their design decisions.

Several scholars have offered principles, guidelines, and factors that may be valuable to explore in the context of authentic practice, shifting the focus from solely an application or enactment of theory or models. Parrish (2009) offered a set of five principles and 12 guidelines, based on his understanding of aesthetics and pragmatist philosophy, which emphasize issues to be addressed by designers rather than theoretical prescriptions. Hardré, Ge, and Thomas (2006) revealed how the interaction of a number of factors, such as perception about learning, background experiences, individual needs, and learning strategies, may have an impact on development of ID expertise. Rowley (2005) stated that common expert practices can help novice instructional designers improve their expertise, and that design experts are more likely to be better problem solvers because they use their background knowledge and personal experiences (Ertmer et al., 2008). Ertmer, Stepich, Flanagan, Kocaman-Karoglu, Reiner, Reyes, and Ushigusa (2009) suggested that explicit guidance or scaffolds based on these expert practices may support novice designers in their problem-solving behaviors.

Design Judgment as a Productive Construct for Studying ID Practice

Another conceptual lens for understanding practice exists, not through the reification of another specific model or theory, but through understanding how professional knowledge is applied by each designer in the creation of an ultimate particular—an intervention of any kind—in the field of ID. Stolterman (2008) has expanded our notions of practice, explaining and arguing for the value of *phronesis*—practical knowledge (Dunne, 1997)—and how that knowledge is applied in a substantial way, without attempting to frame design activities primarily as, or only as, science.

Using the work of Holt (1997), Vickers (1984), and Polanyi (1966) as a baseline for understanding how experts make largely tacit judgments in the act of designing, Nelson and Stolterman (2012) identify multiple components of this rich construct, providing a framework for observing and understanding designing in situ more completely than is possible using highly abstracted models of designing. In IDT, Yanchar and Gabbitas (2011) have introduced the concept of *conceptual design sense* and *critical flexibility*, which appear to be directly related to the notion of design judgment. Dunne (1997) defines judgment as:

> . . . an ability to recognize situations, cases or problems of this kind (which are precisely of no clear specifiable kind) and then to deal adequately (effectively, economically, elegantly) with them. A person of judgment respects the particularity or individuality of the case—and thus does not impose on it a Procrustean application of the general rule. (pp. 209–210)

Thus, judgment explored as a manifestation of practical knowledge allows us to understand and deconstruct practice on its own terms. Concepts such as conceptual design sense and critical flexibility (Yanchar & Gabbitas, 2011) appear to point to this larger construct of judgment outside IDT, and we will take on this broader framing of design judgment for the remainder of this paper.

In this study, we seek to answer two research questions: (1) What do instructional designers do in practice consistent with design judgment? and (2) What design judgments take place in instructional design activities?

Method

This is an exploratory study, using direct observation of designers in situ at two professional ID consulting sites, chosen for their accessibility to the research team. We carried out observations of any activities that we were allowed to view during our visits to these sites, without restricting ourselves to those activities that the IDT literature might traditionally call "design" (e.g., Branch, 2009; Spector, 2012).

The design of the study was oriented toward a conceptual model from the literature—Nelson and Stolterman's (2012) judgment framework—but not conducted with that model as a rigid, a priori framework. Following our observations, short interviews were conducted with participants to clarify activities researchers observed. The researchers collected and analyzed observation and interview data using primarily interpretive methods, well established and highly rigorous in the traditions of qualitative and critical inquiry.

The research team, which included nine members, prepared in advance for the observations by discussing in depth the design judgment concepts put forward by Nelson and Stolterman (2012) and practicing observations of a simulated design exchange and several publicly available design meetings. The team also practiced data capture methods, refining a shared understanding of expectations for recording rich observations.

Data Collection

Context and Participants. Observations were carried out at two sites of ID practice: (1) a campus-wide, in-house consultancy serving the faculty of a large Midwestern U.S. university; and (2) an established ID firm of more than 70 employees consulting to a broad range of commercial clients. A total of eight practicing instructional designers participated in the study, one from the in-house consultancy, and seven from the commercial firm. A convenience sample, these instructional designers represented a range of expertise in ID, and had varied formal education, although all but two also held master's degrees in IDT. The participants included three males and five females, with job titles that ranged from contractor to director.

University Consultancy. The university consultancy was located within the main library on the university campus. It comprised a large main space where consultants met with clients, and small offices for each of the consultants. The participant we observed used his office to conduct a Skype meeting with his first client, while he used the shared main space for a face-to-face meeting with his second client. The participant's role was to assist faculty with technology integration in their courses, working both as an instructional consultant and media developer.

Commercial ID Firm. The commercial ID firm was located in a city building. The firm had recently expanded into a new suite, and their offices were spread out across multiple spaces connected by public hallways. There were several other companies on the same floor, but the ID firm dominated most of the space. Most instructional designers did not have private offices; instead, the majority of employees worked at cubicles in large open rooms. Some instructional designers did work in smaller offices, occupied by either one or two employees. The participants' role was to consult with clients and work with media developers and content developers to realize the interventions (often instructional) required by the clients.

Sources of Data

Six researchers from the team collected data through field observations of participants while they conducted their everyday activities. These observations were carried out by teams of two researchers, each pair "shadowing" a study participant for one and a half to three hours, depending on the participant's availability. One participant (Ethan) was included in two separate observations. Data were recorded exclusively as handwritten field notes taken by both members of the team throughout the observation period. No audio recordings of the primary observations were made, both to protect the confidentiality of the participants and their clients, and to focus our attention on the largely tacit judgments we intended to observe that might not be captured satisfactorily in an audio-only form. At the conclusion of the observation period, the researchers interviewed the participants, augmenting their notes at that time with audio recording. They asked demographic questions, questions clarifying activities or actions by the participant during the observation, and probing questions regarding some judgments the team observed.

After the data collection was complete, the researchers combined their field notes into a digital narrative, using handwritten field notes and audio from the interview to generate a detailed record (Carspecken, 1996; Lincoln & Guba, 1985), cross-checking each others' notes, and using recollections from the observation experience to generate a reliable account. In total, nine records were generated from eight participating designers, with one designer (Ethan) participating in two sessions.

Analysis

The team of nine researchers participated in the analysis of data, which included two primary phases. First, the team unitized judgments in the record, then coded them using the types of judgments outlined by Nelson and Stolterman (2012). Second, the team created summaries of each observation that included: the primary settings of action and the types of judgments contained within each setting, the environment in which design activities took place, and the normative infrastructure that constrained the activity of the individual designer.

Phase I: Unitized Coding of Judgments. The team identified all instances of potential design judgments, using this approach to unitize the field note data record. The research team was divided into pairs, and each pair was given two data sets to analyze based on a coding process that was developed using the design judgment framework. These pairs then came to a consensus on the design judgments being made by the participants, identified salient examples, and developed working definitions of the observed design judgments (Table 1). Each example and definition was reviewed and discussed by the entire research team to ensure a general understanding of the framework. The team then invited the design scholar Erik Stolterman to meet with us and clarify the framework, ensuring that we were using the framework in an appropriate manner. Following this visit, the team created a set of exclusion criteria to further refine the data set and began the process of reconstructing the context surrounding the unitized judgments by developing holistic case summaries. The exclusion criteria included: (a) actions that are not directly related to design activity (e.g., everyday office work); (b) actions not performed by the designer being observed; (c) meta-statements about design or design activity (i.e., all commentary that does not constitute a design decision in its own right); and (d) design judgment might be occurring, but where too much inference would be required to make that decision.

Phase II: Holistic Case Summaries. To ensure deeper understanding of what we saw in the field, the team conducted a second round of analysis. The rationale for completing the holistic case summaries was that the earlier phase did not fully account for the contextual factors that may have affected the emergence of design judgments, which we recognized during our meeting with Erik Stolterman.

To maintain reliability, we paired the original two researchers who conducted each observation with a researcher who was not part of that observation team. The analysis in this phase accounted for the setting where the activity took place, the infrastructure of the observation, the environment in which the design activity took place, and the norms that constrained communication and judgments, and highlighted the participants' role or position in the design situation. Individual summaries were created, the groups came to consensus on a group summary, and finally the entire team evaluated each summary and came to consensus on a final summary.

TABLE 1	OPERATIONALIZED TYPES OF JUDGMENTS (ADAPTED FROM NELSON & STOLTERMAN, 2012) USED BY THE RESEARCH TEAM
JUDGMENT TYPE	**OPERATIONALIZED DEFINITION**
Framing	Creating a working area for design activities to occur, often by introducing constraints (client or tool) or ways of assessing outcomes. This occurs dynamically across multiple levels.
Deliberated offhand	Recalling to consciousness previous judgments that have led to successful practices and opening them to the possibility of adaptation or use.
Appreciative	Placing high value and emphases on certain aspects of a design situation while backgrounding, or lessening focus on others.
Quality	Making design decisions about the effectiveness of visual and other forms of style, or to demonstrate due diligence, often in accordance with company standards, in relation to a concrete design artifact.
Appearance	Assessment of overall quality, relating to an entire product or experience, rather than just a portion. This often includes part/whole relations within a frame of aesthetic experience or measurement against heuristic(s).
Connective	Making connections, or bridging various design objects that are central to the design process and activity. The connections made in this context are not generalized but specific to the design situation.
Compositional	Making connections or bringing various design objects together that are central to the design process and activity. The connections made in this context are generalized and not specific to a particular design situation but to the overall process.
Instrumental	The selection utilization, or influence of a tool, concept, or method in reaching an established design goal.
Navigational	Considering a path, plan, or certain manner (of individual, disciplined preference) in approaching a task or a challenge to get to a desired state.
Default	Giving an automatic response to a situation without deliberation.
Core	Statement about one's value or thinking, usually revealed when pushed by "why" questions concerning one's judgment.

Findings

In the first round of analysis, we identified the kinds of design judgments in which the practitioners were engaged and the frequency of such judgments during the period of observation (Table 2). We did not attempt to draw statistical conclusions from these numbers, only to illustrate by simple frequencies some features of what we noted in the observations.

The total number of unitized design judgments we identified across all observations was 317. The most frequent type of judgment observed was framing, which occurred 47 times. The least frequently observed type was core judgment, identified only 3 times across the nine observations conducted. The average number of the judgments across the sample was 35.2, ranging from 12 (Ethan, B) to 92 (Sally) during individual observations. Table 2 shows that each of these designers was making a variety of different types and frequency of judgments, regardless of the project phase or activity taking place during the time of the observation.

There may be many reasons for this variation, but some may be due to the limitations of the study. These limitations include: (a) each observation was conducted by two researchers with different levels of experience in observational methods, which caused inconsistency in the field notes taken during the observations; (b) the observation period was constrained by participant availability; and (c) each observation was coded by a subset of the team, and was not coded by all researchers.

Case Descriptions

In Phase II of analysis, we created summaries to capture holistically what was happening in the field when these instructional designers were engaged in design activities. We assigned pseudonyms for each participant. Within each summary, we introduced the participant by providing background information, including the designer's educational and professional experience, the context of the work, and the role of the participant in this setting. We then noted what kind of design activities the designer

TABLE 2 FREQUENCY AND TYPES OF DESIGN JUDGMENT BY PARTICIPANT OBSERVED

	FRAMING	OFF HAND	APPRECIATIVE	QUALITY	APPEARANCE	CONNECTIVE	COMPOSITIONAL	INSTRUMENTAL	NAVIGATIONAL	DEFAULT	CORE	TOTAL
Gabriel	9	8	10	4	5	4	2	8	5	0	1	**56**
Emily	5	6	8	2	0	3	4	8	6	10	0	**52**
Julia	0	4	3	5	4	2	4	2	2	4	0	**30**
Heather	5	1	7	0	0	0	0	0	3	0	0	**16**
Ethan (A)	6	0	3	1	1	0	0	1	5	2	1	**20**
Ethan (B)	3	0	2	1	1	1	0	1	3	0	0	**12**
Claire	3	3	6	3	1	2	3	2	3	0	0	**26**
Adam	3	3	0	1	1	1	2	1	1	0	0	**13**
Sally	13	4	4	8	14	7	5	13	8	15	1	**92**
Total	47	29	43	25	27	20	20	36	36	31	3	322

was engaged in during our observations, how the designer made design decisions, and what influenced those decisions. When the participants explained what they were doing when we observed them, we included details based on what they told us as well as things we directly observed, unlike during the first phase of analysis where we excluded judgments that were reported but not observed.

Gabriel (University Consultancy). Gabriel had worked in this office for two years, and he had worked in the field periodically over three or four years before he came to the university. His role was assisting clients with technology integration into their courses. Gabriel's first client during our observation was an instructional consultant in the School of Education. They were working on a workshop presentation for an upcoming symposium held by the client's office. For the second client, he was developing an online version of her workshop in oral history for a research center on campus. In both cases, Gabriel worked both as a consultant and a developer. In the meeting with the first client, Gabriel focused on his concerns regarding the time of instruction, workshop format, and purpose of the workshop. He also seemed to be working with multiple kinds of judgment simultaneously, such as considering the possibility that workshop participants might be interested in attending multiple workshops taking place simultaneously. The second client was a content expert with minimal technology skills, so Gabriel supported her in developing an online version of her workshop as a media developer. The decisions they made were detailed: chunking materials to avoid scrolling, using green to indicate correct answers and red to indicate incorrect answers on quiz feedback. Gabriel also suggested providing explanations for both correct and incorrect answers, and together they decided to organize the content into themes. Gabriel also made technical decisions, such as using HTML5 instead of Adobe Flash to make the content accessible on iPads. We observed in both meetings the participant's strong belief in Merrill's first principles of instruction (2013), and because of that belief, he always tried to incorporate authentic tasks. We infer from this observation that his design decisions were influenced by clients and made as a team. Furthermore, his philosophy seemed to play an important role in what he focused on while making design decisions.

Emily (ID Firm). Emily recently started working in the company as an instructional designer. She mentioned working in museums in this capacity previously, and has a master's degree in the field. Because of being new in the company, she worked with the help of a mentor. During the time period of the observation, she stated she was working on two projects. While we observed her working, her focus was on a project for which she would have a phone meeting with others working for the project. She was getting prepared for the meeting by making changes on the slides that would be used for presenting the project to the client as well

as multitasking—checking and replying to e-mails. During this time, we observed her unique design considerations and their influence on the design, such as emphasizing the importance of knowing the audience she was designing instruction for and developing strategies to gather information about the audience. During the phone meeting, there were clearly external factors influencing her design decisions, including her teammates and especially a senior instructional designer in the company, who dominated the meeting and made the major design decisions. Therefore, the position and role of the designer seemed to shape the ability for one to make a design decision. After this phone meeting, we also observed her meeting with her mentor and talking about the project she had just been speaking about. We saw that her mentor was making suggestions to her for improving the design; this was another external factor that influenced her design. Later, when talking about her reasons for design decisions she made, she referred to using her intuition as well as the foundational knowledge and accumulated experience she has. Even though she is new in the company and becoming adapted to the setting with the help of her mentor, she did not hesitate to bring her practical knowledge into play, integrating her existing knowledge and skill into the new situation.

Julia (ID Firm). Julia has been an instructional designer for more than five years and has a multidisciplinary background in fine arts, instructional technology, telecommunications, library science, and information science. In addition to serving as a team leader responsible for the quality of work of 12 people on the project, Julia trained and mentored less experienced designers. She mentioned using the ADDIE model as a general guideline. During the observation, all of her work was carried out on the computer. Because Julia leads the project, she spent a lot of time checking, editing, and updating others' work. We also observed her reviewing the work of a media developer, assessing it in terms of visual design and ID. Julia mentioned the written guidelines created at the beginning of projects and explained that both the guidelines and her intuition are the basis for her feedback to her team. Overall, it seems clear that Julia was making decisions continuously as she reviewed and re-reviewed materials; she was making many of these judgments and communicating them to others, but she mentioned "styles are [a] team effort" involving members of the team, a client specialist, and project developers. It seems as if external factors (e.g., clients and projects) and internal factors (e.g., knowledge and experience) influenced her design decisions. Throughout this observation, personal intuition and coworkers' interactions provided her with what could be viewed as a framework for making design decisions. It also appeared that her judgments depended on a variety of factors: holistic judgments taking place seemed strongly related to a body of guidelines, knowledge, and standards built up over the course of the project, with some established early on in the absence of client guidance, and others being added along the way. We

can infer that instructional designers like Julia seem to make multiple design judgments at the same time, using knowledge of instructional design and practical knowledge, which Julia referred to as "intuition."

Heather (ID Firm). Heather is a project manager, an experienced instructional designer in the field and in the company. She has been an instructional designer for 11 years and holds a master's degree in instructional systems technology and technical writing. She mentions that her background knowledge in management and human performance comes from the courses she took in her master's program. She did a substantial amount of story-based writing before coming to the company, which helps her now with her projects. The majority of the observation covered a conference call and a short face-to-face, walk-by interaction. The teleconferencing session was between Heather as project manager, a senior instructional designer, and a client. She appeared to be making mostly navigational decisions, as required by her role. She seemed experienced, showing wisdom in the way she handled issues such as the terminology to be used and the management of their teleconferencing time. Her relationship to the colleague in the walk-by conversation was unclear, but represented internal structures and how they contribute to client work. In discussion with another manager, Heather was able to see that her current methods of keeping track of the project were no longer efficient, as the project expanded and she needed to account to the company in terms of profits. She appeared skilled in the way she managed the client. For instance, she incorporated strategies to make the client think, and to guide them to figure out what they really wanted from her as a consultant. We also observed that she was guided by company principles or guidelines, which included high-level decisions such as how learners are evaluated, and the need to allow customization of learner paths in the system. This gave us insight into how instructional designers in high-level management positions manage a project and find new ways to manage them better.

Ethan (ID Firm). Ethan has been working for two years in the company as an instructional designer. He holds a bachelors degree in information technology and is pursuing a terminal degree in ID; he shares an office space with 10–14 people working alongside him. His primary communication tool is an Internet messaging function with which he communicates with other colleagues in the office. He is a multitasker; during both time periods when we observed him, Ethan was engaged in several projects. One of the projects was for a major client, and the others were smaller projects. We observed him documenting information gathered from the client by following standard company procedures. Ethan has the ability to identify issues and propose potential solutions for clients, such as reviewing training sessions and locating portions that needed to be cut. It appears in this observation that interactions

and negotiations among instructional designers took place. In particular, one of his clients asked for last-minute changes and was late in submitting some deliverables. Ethan also visited colleagues' offices to discuss emerging issues, because he preferred face-to-face interactions. These discussions were important because we saw the instructional designers' personal perspective and how Ethan brought his own set of skills and expectations into the design situation. We were able to observe how a designer with two years of experience makes design decisions in an environment, requiring negotiation with his teammates and clients.

Claire (ID Firm). Claire is a senior instructional designer with six and one half years of experience in the company and a master's degree in educational technology. She has in-depth knowledge about designing instruction and about workflow in the company, based on her experience. During our observation, Claire had a phone meeting with a client for which she prepared beforehand. It is her habit to create a document for her own use in addition to the official design document used by the design team. She takes notes, highlighting where clarification or attention is needed in this document. During the meeting, we observed her keeping a to-do list, taking notes, and taking alternately passive or active positions based on her duties within the project. When she actively engaged in the meeting over the phone, Claire listened to the client's demands and identified their needs. Meanwhile, she asked for information and clarification from the client to ensure that she understood the client's needs and got adequate information for the project. Without this information, it seemed that design judgments later in the project might be difficult for her to make. We observed her taking different roles in the process of design and recognized that her design decisions were made in a team-based design environment, which included other instructional designers, a media developer, a content developer, a project manager, and the client.

Adam (ID Firm). Adam is in a leadership role as a team leader and manager; he has a background in journalism and ID. He has been with the company long enough to work his way up from interaction designer to manager, leading a team of about 10 while managing his own projects. From this observation, we were able to see design judgments in the context of management philosophy and to see how possible structures and solutions for problems are imagined at early stages. Adam says that his management philosophy is that it is important to know employees on a personal level, and to see that they are in projects and teams that are appropriate to them because there should be "support for people over support for projects." His actions were consistent with his stated beliefs in our observation, as he would travel around the building to speak directly to people, often going to several areas to find them.

He told the researchers that people were frequently scheduled for multiple meetings simultaneously and would have to choose which was most important to attend. We observed from his messy desk and takeout containers that he likely worked through his breaks and spent long hours in his office. From his conversations with others in the company, Adam is concerned with identifying potential problems and risks ahead of time, especially with large or expensive projects. These observations also lent an understanding of managing resources of both people and money within ID, as well as off hand design judgments, management-related design judgments, and how managers oversee designers interacting with clients.

Sally (ID Firm). Sally works as a senior instructional designer, but not in a management role. She has a background in film production, with additional experience in corporate training. Much of the observation took place as she interacted with a junior instructional designer; therefore, we saw design judgments from both her perspective in a training or mentor role, and also how instructional designers make decisions in a team or group setting instead of an individual one. Because she worked closely with her coworker, many of her judgments were expressed externally, allowing the observers to see in more detail how she came to her decisions. Her work is visual, and we observed that Sally would highlight and move text quickly as she thought through not only the sentences she was constructing, but possibly other factors as well. This reflected what she called her "common sense" approach to design; that it was not only a good sentence, but there was strategic writing involved as well. She used a company-specific tool, an issue tracker, that showed the built-in quality assurance steps, and how designers engage with the final learning materials on numerous levels. This observation allowed us to see both framing and instrumental design judgments used by Sally, and observe how designers work together on projects and in mentor-like roles.

Discussion

Judgments Are Happening All the Time

We saw instructional designers make an average of 35 design judgments in every observation session, each of which ranged from one and a half to three hours in duration. With a total of 20 observation hours, this resulted in 16.1 judgments per hour averaged across all participants. This finding indicates that instructional designers were making design judgments more often than might be anticipated based on the discussions in a recent study in which ID scholars discussed the exercise of judgment as a discrete event involving choice of media or instructional strategies (Boling, Easterling, Hardré, Howard, & Roman, 2011).

Judgments Are Clustered and Layered

There were many moments in the observations when we saw multiple design judgments being made concurrently. Erik Stolterman described the nature of judgments "in the wild" during an in-person meeting, an explanation that helped to elucidate these findings:

> Think about them [judgments] as pearls and they are connected with strings. If you take one and you hold it up, then the other one just hangs, as a cluster under […] it is more like a network, so they all are connected to every one in some way. (E. Stolterman, personal communication, November 18, 2013)

This discussion clarified our understanding that design judgments presented in the framework represented pure types. In reality, "some of these [judgment types] are always together […] so blended, you cannot separate them" (E. Stolterman, personal communication, November 18, 2013). To illustrate this layering and blending of judgment types, we highlight an episode from one of our observations:

> She started the meeting [with a client via teleconferencing] with questions. She needs clarification on the document to understand the content better and said she wanted to ask questions to the person who created high-level outline. […] She continued making clarification on the understanding of the content and she asked "what communication skills and active listening skills mean." She wanted to be sure whether what she understood is the same as what they mean with these terms. Then, she stated that she would like to have the definition of "active listening skills." (Claire, 123–124; 164–166)

In this case, a framing judgment appeared to be most evident, or foregrounded (i.e., the pearl that is held up), as she sought to understand the content within the document by asking questions. She checked the high-level document and also the person who created it. In the process, she clarified specific terminology and then asked deeper questions relating to the subject matter of the training, communication. Here, she seemed to be exercising connective judgment in trying to get to the composite whole of "communication." While she worked toward this communicative "whole," she also seemed to emphasize certain aspects of communication over others, which is characteristic of appreciative judgment. In this way, connective and appreciative judgment "cluster behind" or are given less importance or emphasis than the primary framing judgment.

> She [Sally] drafts some new text to resolve some of the alignment issues that Emily and she had discovered earlier. She highlights and moves text around, deleting some as she quietly works, it seems like she is considering many factors of strategic writing, not just writing a good sentence. (Sally, 260–263)

In reviewing content, Sally, a relatively experienced instructional designer, was primarily exercising framing judgment as she made decisions on what should be included within that segment of material. Clustered closely behind were her judgments on quality and appearance, seemingly guided by her experience. In addition to the clustering quality of judgments, we observed that in this situation the framing judgment did not frame the entire project, but a portion of it; this framing occurred within the larger framing of the whole design, suggesting that judgments are layered, or nested. The philosophical framework we are using may require more than one dimension of complication to describe the enacted experience of designing instead of the conceptualization of design.

In terms of the types of judgment outlined by Nelson and Stolterman (2012), framing (47 times) was the most observed, followed by appreciative (43 times). As suggested by the nature of core judgment—buried deep within the designer (Table 1)—it was observed only three times. Additional work may be needed to understand more completely how designers choose to focus on specific types of judgments. A study that makes a closer correlation between what is happening in the design project and how judgments are being made would be worthwhile.

Judgments Create and Are Shaped by Situational Factors

In our observations, we saw how design judgments create and are shaped by an array of situational factors, to the point that they may not be separate from situational factors, such as the design environment or office culture; the role or position of the designer; and the kind of project, client, and external constraints. Design judgments can create the environment in which design activity is enacted, and, reciprocally, the situational qualities of a particular design context can then shape the kinds of judgments that can be made. In particular, we contrast this understanding with that discussed by Boling et al. (2011) in which a learned model of design is seen as representing the right way to design, and situational factors are seen as hindrances to that right way, rather than being seen as legitimate, inextricable, and inevitable aspects of design itself.

Design Environment or Office Culture. Gabriel worked as an ID consultant within an academic institution. Within this environment, he made reference to instructional theory in his design judgments as he worked with his client—an academic—and this strategy was well received. In the decisions made, the client–instructional designer power structure did not seem to play a part; in fact, the client valued Gabriel's judgment in deciding the inclusion of content. In the commercial ID firm, the hierarchical power structure appeared to be in play in design judgments of some participants. For example, Heather, a project manager, used her navigational judgment in determining the direction, focus, and follow-up during a teleconference with the client and another instructional designer in the project. Norms were also an important element in design

judgments. For example, we saw many design judgments made in collaboration with a team where norms, however implicit, will always be assumed to be in play. Company guidelines and principles (e.g., company philosophy, common knowledge base built up) were also referenced in the design judgments of Julia and Heather.

Role or Position of the Designer. Within the commercial firm, the instructional designers had different roles and experiences. As a relatively new instructional designer, Emily made her design judgments in consultation with teammates, especially the senior instructional designer, who was also her mentor. Sally, a senior ID mentor, often explained her design judgments aloud for the benefit of the mentee. She referred to a variety of documents, as well as a sophisticated issue tracker tool, in her design judgments. Another senior instructional designer, Claire, was oriented toward understanding client needs in her design judgments, and took on different roles as she coordinated work within her team. We also saw strategic decisions and navigation judgments made by Adam, a high-level manager. He was guided by his core judgment, his philosophy of being people-oriented, and knowing his team well—to find the best fit for their knowledge and skills.

Project, Client, and External Factors. In both of our observations of Ethan, we saw how his work was shaped by external factors—his client was asking for last-minute changes and was not timely in some of the deliverables. Ethan exercised his judgment in interpreting client requests and communicating them to his teammates. Heather used her navigational judgment in dealing with ill-defined requests from clients, showing skill in managing them. Gabriel exercised multiple judgments as he negotiated the details for an upcoming workshop in a symposium, as his client explained the structure and vision of the workshop. In these examples, we see the ways in which instructional designers and clients interacted around often-complex factors—in relation to time, amount of information, or other issues—in which there was no "best" or "right" way to react. Instead, we observed instructional designers making difficult decisions—or judgments—which represented trade-offs in relation to the final designed intervention.

Limitations

While we consider this study to be powerfully suggestive because of its contextualized nature, we recognize its limitations. The first is scope. Our observations were captured over a period of one and one half to three hours, and were limited to each designer's workspace. The researchers were unable to observe continuity of design judgments across a project's lifespan, or across all parties working on that project.

Related to scope is variation in the sample; we used a sample convenient to us and amenable to our observations. Although there were a total of eight participants in the study, seven of them were from one ID firm, and only one from an academic institution. In addition, most of the designers were educated in the same graduate program. Consequently, we can assume that we did not observe the widest possible variation in practice. We do not seek to make generalized claims based on these two settings or on the variation between instructional designers, but to highlight design judgment practiced by those instructional designers across some variation in positions or roles, experiences, and projects.

As in any observational study, we were not immune to selecting the occasional participant who explains his or her practice rather than demonstrating it, as did one participant here. Recognizing this, the exclusion criteria for Phase I analysis included "meta-statements about design or design activity." We did find this participant's explanations useful, however, in Phase II and for the discussion of the study.

Last, Nelson and Stolterman's (2012) philosophical framework for the discussion of design judgment was not intended to function as a fully operationalized, or even comprehensive, model of design judgment. Nevertheless, in the situation we find ourselves in as scholars, where the research-ready frameworks in our field reify a view of designing that marginalizes or excludes the very aspect we hoped to view, this framework offered the most viable structure we had available.

Implications and Conclusion

The ID field is replete with prescriptive theories and systemic process models that attempt to theorize practice, often without a rich and detailed understanding of that practice. This can be unproductive and even detrimental to both practice and scholarship. Such attempts tend to redefine practice via theoretical argumentation (e.g., the paradigms and ADDIE superimposed by Visscher-Voerman & Gustafson, 2004), thereby generating inappropriate or even unusable tools and widening the gap between theory and practice (Stolterman, 2008). Defining practice on its own terms and working toward improvement of it from that basis holds the promise of expanding the aspects of practice that can be addressed by theory and of improving alignment between the two (Gray, Stolterman, & Siegel, 2014).

Although small in scale and exploratory in approach, this study illustrates that the sophistication and complexity of ID practice in the field are not well captured in codified models or theories, no matter how detailed those might become.

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Evidence from this study suggests, instead, that instructional designers employ multiple forms of professional design judgments throughout

their projects, and those judgments are required on a continuous basis, not as one-time adjustments to a model or decisions regarding which model is to be used. We also see how each designer made design judgments shaped by the particularities of each situation, and note that this required a form of reflection-in-action (Schön, 1983) that must be a habitual, as well as continuous, dimension of how each designer works.

These judgments are intertwined with the context of designing, are not fully determined by the rational scientific guidance available, and are clearly not reported in studies that confine designers' voices to the choices offered by an a priori model of their work.

How are designers forming these judgments when the ability to do so does not appear to be addressed either in our models or the texts we use to educate practitioners (Smith & Boling, 2009)? We speculate that experience is the source of many judgments, but find that this speculation raises more questions than it answers. What types of experience yield more or less appropriate judgments? What kind of learning experiences might be provided for ID students to support development of the capacity to use experience for the development of judgments?

In this preliminary study, it is not possible to specify the mechanisms of judgment, or the development of expert judgment. However, establishing that instructional designers are using this form of design knowledge, even though it is barely discussed in the field, opens a space for examining it, understanding more about it, and determining methods to develop and use it.

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