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RESEARCH ARTICLE

"There's got to be a better way to do this": a qualitative investigation of informal learning among instructional designers

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Abstract This study employed a qualitative research design to investigate informal learning among practicing instructional designers. Prior research has examined how instructional designers spend their time, make decisions, use theory, solve problems, and so on, but no published research has explored the nature and role of informal learning in instructional design work. Based on intensive interviews of practitioners in the field, this study produced eight themes organized according to two metathemes: (a) the nature of informal learning in instructional design practice and (b) instructional design as informal learning. Specific themes concerned what instructional designers learn through informal practical experience, how they learn it, and the meaning of this kind of learning for various aspects of their work. Overall, these results suggest that informal learning is a vital part of instructional design practice and that design itself can be thought of as a specialized type of informal learning. Other conclusions regarding informal learning in design are discussed and future directions for research are offered.

Keywords Informal learning · Instructional design · Innovative · Qualitative · Hermeneutics

Introduction

Studies of instructional design practice have, in recent years, begun to illuminate the complex nature of work in the field. Research in this vein has described various aspects of what instructional designers do and how they manage the production of learning experiences—including activities such as decision making (Christensen and Osguthorpe 2004; Kerr 1983; Wedman and Tessmer 1993), problem solving (Ertmer et al. 2008; Liu et al. 2002), theory use (Yanchar et al. 2010), evaluation (Williams et al. 2011), and related activities (Hardre et al. 2006; Kenny et al. 2005; Kirschner et al. 2002; Rowland 1992). These descriptions of instructional designers laboring in their craft offer a base of

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knowledge that may inform future scholarship, especially pertaining to the field's understanding of design as a professional educational practice. As some have argued, an important question facing the field concerns how to conceive of instructional design per se and the identity of those who engage in design work for educational purposes (Christensen and Osguthorpe 2004; Smith and Boling 2009; Yanchar et al. 2010).

Within this literature, some attention has been paid to formal instructional design training (Carr-Chellman 1999; Hoadley and Cox 2009; Quinn 1994; Rowland et al. 1994; Visscher-Voerman et al. 2007; Yusop and Correia 2012) and the development of expertise (Ertmer et al. 2008; Ertmer et al. 2009; Hardre et al. 2006; Kirschner et al. 2002; Perez and Emery 1995; Rowland 1992). While there is much yet to be studied with regard to the education of instructional designers, this literature has offered useful insights. Most noteworthy among those are that more practical, immersive learning experiences would better prepare students for real-world instructional design work; that formal models and principles do not provide a sufficient knowledge base for instructional design practice; and that the practical wisdom of experts can be studied and described in ways that facilitate the formation of design skills in novices. Such insights dovetail with the emerging view that instructional designers contribute something unique to the design process, beyond what can be accomplished through the careful application of abstract knowledge and design formalisms (Bichelmeyer et al. 2006; Clinton and Hokanson 2012; Nelson and Stolterman 2012; Rowland 1993; Smith and Boling 2009). From this standpoint, the development of unique capabilities as a designer—including intuitive judgment, practical wisdom, and creativity—plays a significant role in the work of instructional design (for more on design and the contribution of designers in general, see Lawson and Dorst 2009; Nelson and Stolterman 2012; Schön 1983).

Despite this progress already made with respect to understandings of professional practice within the field, little attention has been paid to other phenomena bearing on the practical effectiveness of instructional designers and developers, and more particularly for our purposes, phenomena associated with the refinement of instructional design and development skills over time. While prior research has offered insight into design expertise (versus novice practice) and topics pertaining to formal designer training, there has been no focused exploration of the in situ efforts of instructional designers and developers to learn "on the fly" as the contingencies of projects seem to demand. That is, there has been no in-depth examination of the meaning and experiences associated with everyday, informal learning among instructional designers and developers, or the difference this kind of learning makes to their practice.

The concept of *everyday, informal learning*, as we use it, concerns those facets of professional development that do not entail formal curricula and supporting course structures such as instructors, syllabi, assignments, and assessments. As used in the adult learning literature (Eraut 2004; Marsick and Watkins 2001; Merriam et al. 2007), the phrase "informal learning" refers to the common, unstructured ways in which employees become more capable of performing their duties in the midst of professional practice itself. In other words, this is learning for the sake of completing projects, refining skills, and coping with the demands of work, but without formal organizational structure. Informal learning is also distinct from *nonformal* education, which typically involves a structured learning experience with an instructor, curriculum, and so on, but outside of a formal educational system (e.g., community classes sponsored by a local hospital or library). As opposed to both nonformal and formal education, informal learning is a matter of an employee's own efforts to become more competent in some work-related domain, without organized training of any kind.

While we do not seek to diminish the importance of formal and nonformal educational experiences, we are interested in an unresearched but important aspect of instructional

design work—the phenomenon of everyday, informal learning that is considered to be a major source of continued professional development in general and a major reason for success across workplace contexts. Indeed, many have observed that informal learning may be the most important kind of learning in the professions (Livingstone and Ontario Institute for Studies in Education 2001; Marsick and Watkins 2001; Merriam et al. 2007). According to Merriam et al. (2007, p. 35), for instance, "…upwards of 90 % of adults are engaged in hundreds of hours of informal learning" and "it has also been estimated that the great majority (upwards of 70 %) of learning in the workplace is informal…" (pp. 35–36). There is no obvious reason to believe that informal learning is less important in instructional design than in other professions, and an examination of its role in the experience of instructional design practitioners would offer an important contribution to the field's understanding of designer skill development and expertise.

The overall purpose of this study, then, was to explore everyday, informal learning among instructional designers through a research strategy designed to be sensitive to the meaningfulness of those experiences. More specifically, this research was intended to help clarify the nature and meaning of informal learning in the field, offer novices an experiential sense of the practices of reflective, continually improving professionals in the field, and clarify ways that designers may hone their craft via informal learning.

Human learning in general, and informal learning in particular, may be conceptualized in a number of ways. In framing this study, we drew upon a situated and agentic form of theorizing. Scholars from diverse fields have advanced this or similar views, treating human learners not as passive respondents to the environment or repositories to be filled with information, but as agents qua participators actively engaged in a world of cultural practices (Dreyfus 2002; Ingold 2000; Jarvis 2006; Lave and Wenger 1991; Yanchar 2011). Learning, from this perspective, might be best thought of as a meaningful experience in which learners become more familiar, perceptive, and capable within cultural forms of life, often (though not always) through their own efforts to explore the unfamiliarity they encounter in everyday living (Yanchar et al. 2013). In this sense, our interpretive frame aligns with the "participation" metaphor summarized by Sfard (1998), although we assume the existence of significant hermeneutic phenomena not included in most sociocultural forms of participation theorizing—for example, that human existence is characterized chiefly by what human agents care about (what matters to them and is meaningful), and that one's lived experiences are best thought of as narrative in nature (for more on these concepts, see Gelven 1989; Guignon 2002; Heidegger 1962). In conducting this study, however, our main interest was not the elaboration of details regarding specific hermeneutic phenomena, but the general issue of everyday informal learning and its meaning in the lives of practitioners in the field. The perspective we adopted was helpful in conceptualizing learning per se and offering a frame of reference for interpreting specific accounts of learning offered by participants; but the themes we generated, based on our interviews, were straightforwardly about designers' informal learning experiences.

Method

Study overview

Our study was designed to yield an interpretive understanding of instructional designers' informal learning experiences at the workplace. Our research strategy employed a synthesis of hermeneutic (Fleming et al. 2003; Kvale and Brinkmann 2009; Stigliano 1989),

phenomenological (Giorgi and Giorgi 2003), and ethnographic (Spradley 1979) approaches. Our hermeneutic-phenomenological emphasis led us to a procedure focused on the meaning of everyday practices (i.e., everyday work activities). In particular, we employed a set of intensive, semi-structured interviews, including discussions of participants' efforts to improve their skills and cope with the demands of complex projects, in order to explore how designers engage in informal learning and the significance of this activity for their work. We employed interview and data-analysis techniques from phenomenology and ethnography to facilitate our effort to engage participants in thoughtful reflection and to analyze data carefully. This combined approach enabled us to address our specific topic of interest in light of institutional limitations such as employee time constraints.

Our procedure was designed to offer interpretive and negotiated accounts, generating a kind of joint interpretation. More specifically, our results and conclusions constitute a shared understanding between researchers and participants (for more on shared understandings in research, see Kvale and Brinkmann 2009), produced by participant's articulation of their experiences, invited by our particular ways of asking questions and inviting reflection. Through this process, we sought to identify evocative insights and themes regarding everyday, informal learning among instructional designers. Our goal, in this regard, was "transferability" (Lincoln and Guba 1985, p. 124), or more specifically, the generation of applicable insight that can be transferred to other situations and applied in contextually-sensitive ways. It might also be said that inquiry of this sort is intended to offer insight into the activities and situations of life (including design work) through an examination of one's own experience and the experiences of others—what is sometimes referred to as "naturalistic generalization" (Stake 1995, p. 20). It was our goal, in this regard, to produce insightful themes germane to our research topic.

Participants

Participants in our study were employees at an instructional design center at a major university. Our study included six participants—three women and three men—with varied degrees of experience as instructional designers and developers; however, all participants but one had been employed at this institution for at least several years. Five of the participants were primarily engaged in instructional design work, although one specialized in educational videography, another worked primarily as an artist as well as designer on university projects, and one other had recently taken on more significant responsibilities in development as well as design. The sixth participant was trained in design and usability, and now worked primarily as a trainer, instructing (or creating instruction for) faculty on products created in the center (see Table 1 for a summary of our participant information). Our focus on in-depth interviewing prohibited a more expansive selection procedure and investigation. Participants were recruited by e-mail from a pool of instructional designers granted permission to be recruited by the center's director and after IRB approval. In our recruitment process, we strived to achieve some degree of variety in the backgrounds of participants. Finally, we recognize that higher education instructional design centers are unique in some respects and that similar work in other contexts, for example, in corporate or military settings, may entail different workplace dynamics (e.g., Perez and Emery 1995). Nonetheless, we viewed our selection strategy as capable of providing insight into informal learning among instructional designers, particularly among those who work at an organization such as this, which constitutes a sizable sector of the field.

Table 1 Participant information

Pseudonym	Gender	Total years experience	Role at the center	Highest degree in the field
Carol	Female	25	Designer	MS
Janice	Female	4.5	Designer	PhD
Stacey	Female	2	Trainer/training designer	MS
Donald	Male	22	Artist/designer	MS
George	Male	18	Educational videographer	MS
Alan	Male	12	Designer/developer	PhD

Interview procedure

We conducted two semi-structured interviews per participant, in order to become familiar with their regular work responsibilities and to see how informal learning may have been involved in their efforts to perform their duties competently. Two interviews allowed us to gain sufficient exposure to our phenomena of interest and delve into topics fairly intensively. Time between interviews varied, due to participants' schedules; the shortest time between interviews was 1 week (Janice, Alan, and Donald); the longest time between interviews was 13 weeks (George); interviews for the other participants (Carol and Stacey) were 2 weeks apart. Interviews were conducted at locations convenient for the participants, somewhere away from their actual work space (e.g., a private conference room in the center or elsewhere on campus). By the end of the second interview, participants were unable to add more insight from their experiences and we were unable to query in ways that raised additional topics for exploration. The interviews were guided by our concern with designer practical involvement and, particularly, their reflections on the role of informal learning in their work. Interviews were always conducted on separate days. The duration of the interviews varied, but most lasted an hour. The first author conducted all interviews and in many cases was assisted by the second author, who also asked questions during the process.

In the first interview, we queried broadly into participants' background, everyday work practices, and experiences as informal learners in the midst of their work duties. Since we were interested in any experience that they might have found relevant, from their perspective, we refrained from offering a definition of learning; but we did ask them to reflect on times when they needed to learn something new for an assignment or augment their skills in some way. We also asked participants to summarize their current abilities and reflect on how they achieved that level of competence—that is, how they became able to design in certain ways, use certain tools, and so on. In all cases, we were careful to invite them to think about informal rather than formal or nonformal learning experiences. As the interview unfolded, we asked questions such as: "Tell me about a recent work experience" "What could and couldn't you do in this situation?" "Why did you learn more about _____?" How did you go about learning _____?" and "How well do you think you learned _____?" Overall, the purpose of the first interview was to gain a sense of our participants' informal learning experiences, from their perspective.

In the second interview, we asked questions about the participants' views of informal learning in general, attempting to connect their responses with the accounts they offered in the first interview. In this interview, we asked questions such as: "What is it like to have to

learn something new in the midst of a project—interesting, frustrating, enjoyable, difficult, time consuming, exciting, gratifying, stressful, etc.? Under what circumstances?" and "When you've learned something new on the job, what's different? How do you experience the learning in terms of the difference it makes?" The purpose of the second interview was to encourage participants to reflect deeper on the topic and discuss the nature of this type of learning.

Toward the end of the interviews we invited participants to react to some of the preliminary themes we saw emerging in the preceding interviews. In doing so, we were careful to avoid leading questions; rather, we sought participants' views on what we as researchers were beginning to see in the data. In no case did participants refute our emerging insights. However, participants did share their views, which sometimes added nuance or diverged somewhat from what we presented to them. Also, at the end of each session we gave participants an opportunity to comment on the interview and add any additional insight.

Data analysis procedure

All interviews were transcribed according to a predetermined protocol. We transcribed and analyzed participants' first interviews prior to second interviews when possible. When transcriptions weren't available prior to second interviews, we listened to audio recordings to gain a sense of how to conduct the second interviews. Through our data analysis procedure we sought to explicate key insights in participants' experiences as informal learners, expressed as themes, organized according to two metathemes. Our analysis involved a hermeneutic form of data condensation and thematic analysis (Fleming et al. 2003; Kvale and Brinkmann 2009), incorporating techniques from descriptive phenomenology (Giorgi and Giorgi 2003) and ethnography (Spradley 1979) that facilitated our process of organizing data into themes.

Overall, this process entailed the following steps: (1) Gaining a sense of the whole by reading the transcripts and identifying preliminary themes; (2) Refining these preliminary themes into more formal themes—merging, splitting, deleting, adding, editing, etc.; (3) Comparing and contrasting themes to look for connections among them, while continuing to refine; (4) Organizing themes according to metathemes and placing them into an overall thematic structure, while continuing to refine themes and metathemes; (5) Selecting illustrative quotes from the transcripts to exemplify themes developed in steps 1–4; (6) Considering each theme and meta-theme in light of the whole, and continuing to refine; (7) Considering the whole in light of each theme and meta-theme, and continuing to refine; (8) Examining the coherence of the overall thematic interpretation and refining the overall structure. Our coding process, then, involved a thorough familiarity with the transcripts themselves, a careful exploration of many potential themes, and iterative efforts to arrive at a thematic structure that, in our view, reveals valuable insight regarding the topic of investigation.

Trustworthiness

In an effort to treat the data as fairly as possible, we utilized well-known qualitative standards of trustworthiness throughout the research process (for more on trustworthiness, see (Lincoln and Guba 1985). These procedures included progressive subjectivity checks, peer debriefing, negative case analysis, member checking. While many other qualitative standards exist (e.g., Kvale and Brinkmann 2009), we viewed these as most capable of

guiding our efforts to be thorough, accountable, and faithful to the experiences of our participants. Regarding progressive subjectivity checks, we kept a record of our assumptions, values, and details regarding our research process. This process was helpful at illuminating the reasoning behind our decisions throughout the study and enabled us to critically examine our own perspective on key methodological issues. Regarding peer debriefing, we sought feedback from a qualified peer who suggested that our research design was appropriate for our subject matter and met acceptable standards for trustworthiness. Regarding negative case analysis, we sought out contradictions and counterexamples to emerging themes as we analyzed data. We engaged in this process throughout our data analysis and as we reflected on our final themes, in light of the details of the interviews themselves. While participants were not monolithic in their views, they did share significant agreement on many issues; the interesting differences in their views are reflected in the themes and quotes we presented. Upon completion of our initial report writing, we conducted member checks, which all six participants responded to. Although several participants responded with comments about our data and interpretations, none suggested that we had misinterpreted meanings or misused quotes. Finally, we maintained an audit trail throughout the process of the study, which included a research journal (including progressive subjectivity checks, logistical details, etc.), meeting notes, documents pertaining to all aspects of the study (e.g., interview protocol, transcription protocol, etc.), a record of communications (e.g., with managers and participants), field notes, and transcripts.

Results

Through our interview and data analysis process we identified many possible themes bearing on the topic of informal learning among instructional designers. We selected those that related most directly to the research questions and that appeared to yield the greatest insight regarding our research topic (see Table 2). Accompanying quotes were selected on the grounds that they were especially representative of the themes in question or were particularly insightful. Pseudonyms were used for participants. We slightly revised some quotes to allow for smoother flow or grammatical correctness, and to keep responses as anonymous as possible. None of these revisions altered the meanings being conveyed by participants, as suggested by our member checks.

Metatheme 1: the nature of informal learning in instructional design practice

Theme 1: what designers learn

All Participants easily identified some important aspects of instructional design workplace learning, such as gaining necessary technology skills and understanding subject matter sufficiently well to create appropriate learning experiences. Donald succinctly summarized these aspects of designer learning:

> It seems like there are two kinds of categories because of the job I work in. On the one hand, I have to learn about different production methods and techniques and stuff like that, so that I can make the things that our client is asking us to make. And the other one is because I produce educational materials. I have to get up to speed with

Table 2 Summary of metathemes and themes

Metatheme 1: the nature of informal learning in instructional design practice
Theme 1: what designers learn
Theme 2: implicit learning
Theme 3: innovative learning
Theme 4: continuous learning
Theme 5: design imperfect and incomplete
Theme 6: designer judgment develops over time
Metatheme 2: instructional design as informal learning
Theme 7: design (noun) is a reflection of designer learning
Theme 8: design (verb) is a form of learning

> the content area that that professor is working in, so that I understand enough about their content and what they're trying to teach…

Participants also commonly discussed learning to work with others within a given organizational culture—including clients, supervisors, and programmers—as part of everyday practice. Teamwork and communication were often mentioned, particularly as designers worked with developers to create feasible and effective designs. When queried on this topic, Janice discussed how to work effectively with programmers on the team: "…learning maybe a little bit more of communication with them, but also understanding some of the things that they do and what's harder, what's not gonna be as hard…"

Stacey also mentioned the significance of learning to work in teams:

> Interviewer: What do you think is the most important thing that you've learned?
> Stacey: I think probably the importance of working together and really… Yeah, just working together as a team. I think that teamwork is absolutely essential.

Upon questioning, participants in our study also acknowledged that the process of instructional design itself involved a type of learning—that is, becoming familiar with clients, projects, users, and contextual circumstances in ways that allow for the creation of effective learning experiences and accompanying technology such as learning management systems. George, for instance, discussed learning to communicate with clients as a major aspect of his work:

> …learning to deal with clients is really what I do more, unfortunately, more than the setting up the camera and the writing. It's communicating with clients that is the most important thing. Understanding what they want and helping them see that what they want has actually been accomplished.

For Alan, one of the main question facing designers in a university design center is as follows: "A professor wants to accomplish this; what kind of process should the students go through to learn this?"

Donald clarified this important aspect of learning in the design process per se:

> Let's say you come in and you say we need to create this environment for my students that I cannot give them otherwise. And so, I have to learn what that the environment is like and what's going to make a difference for the students and what you want to include in it and stuff like that. And so, in a sense I'm learning a lot about you and your students.

Janice described how learning of this sort pertains to even the details of a project: "So there's a lot to think about even in the smallest little pop-up or a little space on the screen; there's a lot of decisions and thinking and learning about what's going to be best." Janice also discussed the need to learn in order to complete projects: "Well and you had to learn. It wasn't like, 'here do this project and get back to us in a few months.' It was, 'you need to start giving us stuff now because we need to have it programmed in a year.' So it was just fast…"

Overall, the learning tasks of instructional designers and developers in our study were numerous and varied. Some were easy to identify (e.g., new technology, subject matter), while others became clear upon deeper reflection and follow-up interviewing (e.g., determining a feasible plan for effective instruction). What was obvious throughout the research process, with our participants, was that workplace learning of these sorts were essential to instructional design work—at least from the perspective of our participants.

Theme 2: implicit learning

Over time, our participants informally learned important aspects of their practice. Although progress was difficult for them to recognize in the midst of a busy work experience, it became discernible for all of them through the interviewing process. As Stacey stated:

> Well I feel like it's something that I don't really think about a lot. I think it just kind of happens and all of a sudden I've learned something new. It's not something I really consciously think about and put a lot of effort into, "Oh I learned something today."

As participants reflected on their informal learning, they recognized how it influenced their ability to perform and can be an enjoyable part of the job, as Janice suggested:

> There are times where you think some of those things aren't as hard anymore, or it doesn't take as long as it used to take to do something, or whatever it is. So I don't think I ever go through my day and in a moment go "oh bing! I just learned a new thing." But I know that I do things because I think a lot of my satisfaction comes from learning and if I was just sitting and filling out forms all day or doing something else I would feel like I wasn't learning and growing and I wouldn't be satisfied….

Carol suggested that she became more aware of the scope of informal learning over time by interacting with others at professional conferences:

> I think one of the things that conferences are good [for] is that sometimes you come in thinking, "I don't think I know very much" and you leave thinking, "Gee, I knew a lot more than I [thought I] did." When they said that, I thought, "yeah, we do that right."

Implicit learning may not be considered an obvious aspect of employee training in most organizations, but it appears to be quite important to participants in our study, at least upon some reflection. As we suggested above, informal learning may be the most significant means by which employees continue to produce in a dynamic work environment.

Theme 3: innovative learning

Much of the learning described by our participants—implicit or explicit—concerned increased ability to use technology efficiently and learn subject matter correctly. Learning

of this sort can be categorized as "maintenance learning" (Botkin et al. 1979; Jarvis 2006) in that it requires learners to improve skills by becoming familiar with ready-made tools and extant knowledge. This is learning that requires practitioners to gain proficiency in what already exists. Opposed to "maintenance learning," according to some within the adult education literature, is "innovative learning" (Botkin et al. 1979; Jarvis 2006). This is learning with regard to what does not already exist; that is, learning that involves a step into the unknown, so to speak, in some fairly minor or major sense. All participants but one in our study offered descriptions that included a good deal of innovative learning in their design practice.

As designers and developers, participants sometimes learned how to use technology in unique ways to solve problems. Both Donald and George related how they learned to use equipment in novel ways to create certain effects. Donald, for instance, developed techniques for efficiently producing whiteboard animation while George developed a unique way to provide close-up video of a ball point pen tip (magnified many times) as needed in a particular project. In another instance, George described how his team avoided the cost of an expensive camera by using much less expensive equipment in an unusual way. Once created, these innovations add to a stock of techniques to be used by these designers in future projects.

Donald discussed the need to innovate within existing conditions. As he stated: "I would say that most things aren't novel, that they're just variations on things other people have done or a new combination of existing things." He claimed that much of his innovations fit into this category, such as the aforementioned techniques developed to more efficiently produce white board animation.

Perhaps the most significant instances of innovative learning occurred in everyday efforts to design learning experiences. As Janice suggested:

> I think you have to have some kind of creativity or innovation because sometimes you're designing something that, maybe you've never seen it before or maybe your users have never seen it before….They don't even have a mental picture to even tell you what they want; they are more able to tell you "I want something that does this, this, and this," and you have to come up with the picture and the way to put that together that's going to work for them.

Stacey offered a similar assessment: "Well, I think anytime you're developing, especially your own product, you are going to need to be innovative and creative in that way, I think".

Finally, some participants favored an attitude of continual innovation in order to produce quality learning experiences. For example, George discussed how he strives to give learners something beyond video lectures, even if a client doesn't request more:

> I try to keep things as different as we possibly can, because I think there's a better way to teach things. I guess that's the way I look at it. There's got to be a better way to do this, to use the video in a unique way to demonstrate this or to model this or whatever it is that we're doing.

Janice made a similar claim about the need to be flexible and resourceful in one's practice, stepping outside of conventional patterns:

> I guess maybe there is a best way; but I think by breaking your mold of "this is how you have to do stuff" you come up with a better way, than just something that you've learned in a class or something.

Innovation may, in some sense, always be required in design projects that seek to do more than fill templates with preformulated content. This may be at the core of true design in education—finding innovative ways to reach learners, given contextual constraints.

Theme 4: continuous learning

All participants in our study made reference to the dynamic nature of their work—that it requires continuous adaptation to the changing nature of technology, new ideas, complex institutional challenges, and, as suggested in the previous theme, the constant inflow of design projects with their own unique requirements. Designers typically dealt with these challenges through continuous efforts to familiarize themselves with best ways of getting work done in an evolving work environment. Carol summarized the sentiment of our other participants in the following statement:

> I think this field particularly is constant, it is ongoing. There are always new ideas, new approaches, new research, new experts that come and go through the office. And so I look at some more static fields and it may be less true, but I think in our field—especially the technologies of learning—there are always new things going on… Interviewer: And so this is a common thing for you then? To be constantly readjusting, "what do I need to know now, who do I need to go find?"… Carol: Yes, very common. "What are the best tools?" That's always a big question it seems like. What are the tools, and what are the standards?

When asked how he knows he's learned something well, Donald responded as follows:

> It seems like any time I really know something really well, that's when I find out that I don't….that's my experience…that no matter how much you, or at least I, study or learn any one thing, that the more I know about it, the more I know I don't know.

Alan discussed the continual need for assistance and exploration in the design and development process:

> I still have to—I don't think there's ever a time where you memorize all this stuff and you don't have to ever refer to anything; and most of the developers I know, they go to discussion boards and the documentation all the time.

In a later interview, Alan spoke generally of the importance of learning:

> Each new project presents its own little challenges—some require new learning, some not as much, although I don't think you ever want to take things for granted—that you know everything you need to know. And then just the nature of life; there's always things that come up that you need to learn.

Given her involvement in user support of educational technology, Stacey spoke of the continual need to learn product updates: "…as they continue to develop the product new problems keep coming up, so we are always trying to resolve issues as they come up." When discussing the need to learn and adjust continually, the following interchange occurred:

> Interviewer: So, that means you're never stopping to reorient yourself and learn new stuff. Is that right? George: No, I'm always learning new stuff. Interviewer: That's,

like, part of the deal? George: I think it's part of the deal. And that's part of what I enjoy about what I do.

The topic of continuous workplace learning seemed easy for our participants to discuss as an aspect of their everyday practices. While they might not always view their contextual adjustments and inquiries as learning per se—at least in the traditional sense of formalized, explicit learning—their experiences offered evidence of progress in their ability to perform in the workplace via continued exploration.

Theme 5: design imperfect and incomplete

Predictably, participants in our study often referred to practical constraints on the design process, suggesting that what they produce is limited by what can be reasonably accomplished under a given set of circumstances. However, each participant also referred to continual updates regarding technology, which in turn calls for more opportunities for skill learning. The following statements from Stacey offer a glimpse into this aspect of informal learning:

> Interviewer: And so [this application] had continued to be developed through new variations on it? They had new features? Stacey: Yeah. Interviewer: And so that is a never ending kind of a thing there, right? Stacey: Software development is always going to be like that, I think, because you continue to refine and new technology develops and then you say, "Oh I wonder if we could implement this into our product to make it even better?" Interviewer: So is it frustrating to think that they're never going to stop iterating and you're never going to stop learning? Stacey: I hope they keep iterating. Interviewer: You don't mind to keep learning along the way, then? Stacey: No, I hope they keep improving it. That's what I hope just because it'll be a better experience for everyone using it.

Janice indicated that studying other products online to get ideas can be helpful, but that all of those products are limited in various ways, such that there is no perfect approach. She suggested that innovation on the way to a better, more contextualized design is essential.

> I never feel like I can go to someone's in the past and go "ok, yep, let's just draw it just like that and pass it off to the programmers." There's always the learning process of, "Ok, but no one's probably done a perfect design on anything in the past." They probably have a lot of great principles and a lot of key things that people have liked, and how can you take those and then how can you improve it, and how can you adjust it to meet your users and how… just a lot of that process is going on with everything that you work on.

The imperfections of design would seem to be inevitable, not only in light of changing technology, but also in terms of the complexities of the circumstances in which a given design will be used. No learning environment will provide all users exactly what is most optimal under all conditions; but continued refinement and updating can increase its functionality. Importantly, for the purposes of this study, this aspect of design work suggests that learning will be continuous as designers and developers seek to improve their products, and as support teams strive to stay apprised of those developments. Indeed, those imperfections may be viewed as prompts of learning, from this perspective, as they are what create the need for continual exploration, adjustment, and redesign.

Theme 6: designer judgment develops over time

In various ways, observers of the field have discussed the unique contribution of practical wisdom and judgment to the design process (Bichelmeyer et al. 2006; Clinton and Hokanson 2012; Rowland 1993; Nelson and Stolterman 2012; Smith and Boling 2009). The idea is that instructional design involves more than following steps in a design model; and that designers themselves bring a kind of sensitivity to the unique features of a project that enables them to produce effective learning experiences. Designer judgment may involve an intrinsic sense of how to create learning experiences; and that sense may be informed, at least partially, by prior experience with theory and practice. This kind of judgment may be primarily tacit in the midst of everyday work, but is discernible upon reflection. When queried about her use of theories in her work, Carol saw value in the tacit skills it can help develop:

> You wonder at what point that the theories become so much second nature that you are using them without even realizing that you are using them. You just know that this is the way to do it, but you don't stop to analyze why you think you know….

Like Carol, Donald was unable to offer details about the development of his own designer judgment, but several times acknowledged his reliance on it, and that it developed through years of experience. In a discussion of this topic, he stated:

> …I guess because I'm experienced or whatever, I can look at it and tell when it's right or good. Interviewer: How did you get that ability to be able to do that? To know when it's right or good? Is it natural or do you think you developed it over a lot of time and a lot of experience? Donald: Yeah, I think that's, you know, developed in classes and work experiences, stuff like that.

Janice used the language of "internalization" to describe her experience with designer judgment over time. She described how her sense of design developed as she worked on multiple projects and started to cultivate her own design style:

> I like different projects in that way because… as much as they aren't exactly the same, they do relate; so things you're learning on one affect what you're learning on another one. But then also you might say, "Well, I don't want to apply everything I'm doing here because this is a little different situation or something like that." And I guess it maybe helps you internalize, maybe, a design style? I don't know. Maybe it helps me internalize rationale for why I do certain things, and not just do certain things, but why do I do it and when do I do it and when does it makes the most sense and not just I do it this way every day because I'm working on the same project.

When asked about the origin of her design sense, Janice wasn't certain, but offered her best guess:

> I'm sure it comes from lots of things. I'm sure it comes from my own experience with stuff that I use and what makes sense to me; I think it probably comes from watching users and seeing what they do and seeing patterns that develop in their usage.

While two participants in our study did not mention this aspect of their work experience, the other four participants readily acknowledged the development of personal style and designer judgment in their work, through real world experience. They were, however, largely unable to explain the development of this judgment outside of merely pointing to

the importance of experience on the job, dealing with a variety of situations, making mistakes, and attempting to design in ways that provide the best instruction.

Metatheme 2: instructional design as informal learning

Theme 7: design (noun) is a reflection of designer learning

Based on the accounts offered by our participants in this study, learning is involved in the creation of design in a number of ways. And the designs produced—that is, the actual learning environments, learning management systems, training courses, and so forth—are a reflection, at least in part, of what designers have learned, through past experience and in the context of current projects. In this sense, it might be theorized that *design*—in its noun form—is an embodiment of what designers have learned in the midst of their everyday, workplace responsibilities. For five of our six participants, design as an embodiment of designers' learning manifested in their descriptions of their work. For instance, Donald summarized his modus operandi as follows:

> …an important part of my job or my function is to scrounge around, find out, learn as much as I can about the different content areas so that I can present them, or animate them, or create a simulation that's accurate and meets the instructional objectives.

George also readily agreed that, based on his experience, design is a function of his prior and current learning:

> Interviewer: It seems to me that part of what you're saying is that learning that you've acquired is sort of instantiated or manifested in the product that you created. It looks the way it does because of what you learned and how you wove that into your work. Is that right? George: Oh yeah, absolutely. Interviewer: I was thinking a reflection of your learning…George: It is a reflection of your learning and I think it has to be that way; I really think it has to be that way, because every subject is unique. And the products that I push out, I want them to be a reflection of what I understand. And that's the only way I can really think of it, is it has to be a reflection of what I understand from it, because if I don't understand it—I mean I'm not the expert by any means—but if I can understand it and feel like I have an understanding of it enough to actually try and teach that, it has to be reflected in that final product.

Carol offered a brief instance of how a project was heavily influenced by what she had to learn with regard to the subject matter, client expectations, and audience:

> I was asked to help with some design work using Fink's model of teaching and Bloom's taxonomy. Now Bloom I was familiar with, the other one I was not. And although I was more on the "put it together and make it look good" end, in order to do that I had to know where I could cut words. And I had to understand the theory so that I could do a little more broad sweeping things…we had to create parallels between the two [theories] and comparisons, and so I needed to understand the work that Fink had done better because I just wasn't that familiar with him. So I needed to understand that conceptually and how it compared and how it contrasted with Bloom's taxonomy, in order to create a coherent piece that would be useful for our consultants to use with faculty members…I couldn't pass that off to anyone. That was something I had to learn; I had to understand the work of both people in order to pull it into a coherent document.

The idea of design (noun) as a reflection of learning—especially informal learning—may be unusual in a sense, but it fits well with the experiences of participants in our study. Surely design entails many elements, and designers can be reasonably viewed as performing in a number of roles (Hokanson and Miller 2009). But, for our participants, a theme that appears to cut across design tasks and roles concerns the vital importance of informal learning in the moment and what is finally produced, was seen by participants as a reflection of what they have learned.

Theme 8: design (verb) is a form of learning

If the products created by instructional designers are a reflection of their learning, then the work of instructional design itself—that is, design in its verb form—may be reasonably viewed as a unique, multifaceted form of learning. This description of design practice can be seen—sometimes directly (two participants) and sometimes indirectly (4 participants)—in the accounts provided in our study. In one of our interviews with Janice, we specifically asked her to comment on this idea:

> Interviewer: I guess you could push this a little further and maybe say designing—I don't know if this is what you're telling me—designing is a kind of learning? You're just continually learning how to manage a situation, right, solve a problem, or produce something? How far do you go with that? I mean, could you make an equivalency between designing and learning, or is that pushing it too far? Janice: No I don't think so. I totally think designing is learning…For me, I feel like it is.

From this perspective, any specific design project will be an opportunity to explore aspects of a design situation (subject matter, situational affordances, audience needs, etc.) in pursuit of a strategic plan to help learners learn. The descriptions offered by our other participants suggested that learning was entailed so fundamentally within designing that design per se might be viewed as a type of learning,

Discussion

Our primary intention was to clarify the nature of everyday, informal learning among instructional designers. Through this inquiry, we have generated a number of themes that point to the variability and importance of this type of learning, at least for our participants. In general we observed that instructional designers learn in a number of ways with respect to a diversity of topics. Sometimes learning is intentional and explicit, sometimes it is indirect or unintentional; but in any event, it plays an important role in designers' abilities to cope with the challenging demands of work in the field. Designers in our study reported learning topics such as technology (e.g., software, online resources, etc.), course content, people skills, design strategies, and details regarding specific projects in order to create effective learning experiences. This everyday, informal learning was not viewed as optional or as an occasional necessity; in more ways than one, it was described as integral to the work of designing in this field at virtually every level. Design and learning of the sort we have explored here are, in this sense, inseparable; design could not happen without such learning; and such learning—in all its breadth and variability—covers a large proportion of what designers do. For this reason we have suggested that instructional design might be best viewed as a multifaceted form of learning and that the results of design work might be viewed, most fundamentally, as an expression of what designers have learned, both in

general and what they learned on that specific project. With regard to this important form of learning, we have observed in our sample that it is often implicit, innovative, continuous, and involves the formation of judgment and practical wisdom.

The implicit nature of learning and judgment

Our observation that everyday learning is often implicit is consistent with similar observations in the adult education literature (Merriam et al. 2007). While much designer learning is clearly intentional—for example, Carol's conscious effort to learn about what makes a good help system—a significant proportion of informal learning is not. Participants in our study discussed how learning often happens as an unanticipated result of some other task and without explicit awareness. From the adult education literature, these experiences would fall under the headings of incidental and tacit learning respectively (see Merriam et al. 2007). The concept of implicit learning has also been widely studied by experimental psychologists (Frensch and Rünger 2003). However, research in this area is primarily laboratory based, focusing on isolated cognitive tasks and associated neurological processes or on implicit learning phenomena within special populations. Certain schools of philosophical thought such as phenomenology and hermeneutics have also emphasized this aspect of human experience in a practical, everyday sense (Dreyfus 2002; Heidegger 1962; Merleau-Ponty 1962), contending that a good deal of human activity is tacit, though at the same time purposive and meaningful. Clearly, this is an important aspect of human life and learning, and as such, there should be little surprise that instructional designers' work experiences offered evidence of the implicit ways in which they learn their trade.

That a good deal of everyday learning is implicit relates to our sixth theme, which concerns the development of designer judgment. The ways designers design and the practical judgment they use in that process is considered by many to be an important aspect of work in the field (Bichelmeyer et al. 2006; Rowland 1993; Nelson and Stolterman 2012; Smith and Boling 2009), although there has been relatively little empirical examination of this topic in the disciplinary literature. It seems reasonable to surmise that designer judgment develops over time and through experience; and, based on our data, it appears that such development is part of the implicit learning that takes place in the working lives of designers. As we have suggested, designers become at least somewhat aware of their design sense upon reflection, and this reflection may be a prompt for its further development or for the further development of personal design knowledge. From our perspective, further inquiry into this aspect of instructional design seems justified as a way of uncovering important, yet rarely explored, aspects of how designers design.

Continuous maintenance and innovative learning

A relatively unacknowledged distinction among learning types—namely, maintenance versus innovative (Botkin, et al. 1979)—became relevant in our data analysis. Not surprisingly, participants made reference to the process of technology learning and becoming familiar with course subject matter as they worked on projects. As we suggested earlier, these learning experiences are clear cases of maintenance learning. However, our participants also referred to the innovative aspects of design work when engaged in the formulation of learning experiences—that is, the processes of becoming familiar with client expectations, learner needs, and best ways of presenting information or inculcating skills in a particular project. Moreover, innovative learning entailed learning to use existing tools in

new ways to facilitate design work in specific circumstances. Instructional design, in this sense, might be thought of as the progressive innovation or unfolding of a plan to meet certain criteria regarding the needs of learners in a given situation. It should be noted, however, that participants did not initially associate this innovative part of their work with learning per se; but asking them to consider it as such was not a difficult proposition for them to entertain. For instance, Donald did not initially refer to this innovative work as a form of learning, but concurred that it was after being queried. Similarly, our other participants did not initially refer to these innovative activities as a form of learning, but, when asked, acknowledged them as such without any encouragement on our part. This finding suggests that for our participants, designing instruction seems to necessarily entail a kind of innovation that fits within the broad domain of learning, and that this activity is often overlooked *as a form of learning* in the everyday bustle of carrying out one's professional responsibilities.

The innovative and maintenance learning we have discussed in the practices of our participants appear to occur on a continuous basis. Maintenance learning might not be required on every project—at least not on those that entail relatively routine and unchallenging requirements—but innovative learning would seem to be involved in most every effort to design. Indeed, any project that did not involve innovative learning of the sort we have identified in our participants' experience would be difficult to categorize as design per se, at least from the perspective that instructional design primarily involves the progressive unfolding of a plan to help learners learn in a given situation. Merely inserting content into predetermined templates, as efficient as it may be in some situations, would thus not count as a genuine design activity; but efforts to grapple with new situations and formulate plans for producing quality learning experiences certainly would. Learning is also made continuous by virtue of the imperfections and incompleteness of design—which we presented as our fifth theme. If design is truly an unfinishable endeavor, in that no design is ever perfect but perhaps sufficient within certain constraints (see Gibbons 2014; Simon 1996)—and if technological advancements and product upgrades are a fixture in the field (which they appear to be), then anything less than an attitude of continuous learning and pursuit of improvement will leave designers without the capabilities and motivation required to keep up with the dynamic nature of the field. As our participants suggested, however, continuous refamiliarization and upgrading of skills are some of the most gratifying aspects of the job.

Design as a unique type and result of learning

Finally, our themes pertaining to design (noun) as a reflection of learning and design (verb) as a special case of learning are obviously intertwined. If design is a unique form of learning, as we have suggested it is, then what is produced by way of design work can be reasonably described as a product of that learning; and in that sense, any specific design can be viewed as a reflection of what was learned while engaged in a specific project, in conjunction with prior learning in related work experiences. If this is the case, then examining specific designs should reveal something relevant about the means by which they were produced and what the designers came to understand as they worked on those projects. In this sense, design (verb) might be viewed as learning how to solve instructional problems under unique circumstances to arrive at an acceptable design (noun). But, as we have already suggested, design (verb) might also be fruitfully conceived as a form of learning that involves the progressive unfolding of a plan to help learners learn and not solely solving problems as they arise. Design, in this sense, involves a future-oriented thrust that seeks to optimize circumstances eventually experienced by learners through

continual adjustments to the dynamics of design situations, understanding the needs of learners, and so forth. The kind of design learning we refer to here may not involve life-changing experiences; but it involves a shift in designers' familiarity in the midst of practical involvement.

To say that design practice is a unique form of learning encompasses our prior claims regarding innovation, continuous learning, design judgment, and so on, in addition to the rather uncontroversial observation that professional instructional designers must continually learn new technology, consider new ideas, and upgrade their skills to be effective in their duties. In this sense, our final theme (i.e., design = a special case of learning) might be viewed as a kind of summative claim that subsumes the rest of what we've presented, and that no matter what else one might say about instructional design, a full description of it as an educational practice will treat everyday, informal learning, in all its manifestations, as a principal concern. While a few others have identified this connection between design and learning (Lawson and Dorst 2009; Rowland 1993), little discussion of this topic has appeared in the literature. We suggest that greater attention to the idea of design as a form of learning would enrich the field's understanding of design *per se* and disciplinary practice.

Viewing learning and design this way has several implications for practice in the field. One major implication is that, from this perspective, the work of instructional design should not be overly technologized and conceived as the application of a routine process. Projects entail unique circumstances and designers will need to make the necessary adjustments to those circumstances—that is, adjustments involving maintenance learning, innovative learning, or both. In this sense, the designer would be seen as making an important contribution to any design, as their efforts to learn in situ would be a primary force behind what is finally designed. Indeed, following a "communities of practice" line of analysis (Lave and Wenger 1991; Wenger 1998), it might be argued that an instructional designer's identity, as it develops over time, would come to embody this learning-oriented thrust—with the designer becoming a unique kind of learner and design a unique form of learning. It's not clear at present how formal instructional design programs can replicate the powerful learning that takes place in everyday design settings, but the move toward more practical training, studio experiences, and related efforts hold promise. Moreover, it is not clear how training programs might best instill a sense of designer identity that emphasizes informal learning, or even if it's possible for formalized training to do so. Clearly, informal learning can occur within formal training programs, but that learning will be incidental by definition. Nonetheless, it seems reasonable to suggest that exposing instructional design students to the realities of the field and helping them see the need for continuous informal learning at many levels will set a realistic expectation for them as they pursue best practices in the field (see also Bannan-Ritland 2001; Perez and Emery 1995; Quinn 1994; Visscher-Voerman et al. 2007).

Limitations and future research directions

We suggest that future research into design learning is warranted. One limitation of this study is that all designers were from an academic contexts; thus, studying designers in non-academic contexts would be helpful to see how robust our findings are across the wider span of the field. While design work in university centers is clearly relevant, design in other contexts may entail different situational dynamics and different experiences. Moreover, future work in this direction would benefit from more participatory forms of inquiry, such as a stronger ethnographic emphasis (e.g., participant observation, artifact analysis, video

data, etc.) to gain a clearer picture of informal learning by designers. Reflective interviews, which we relied on in this study, are helpful in understanding how designers experience their work, and can be powerful tools in helping practitioners explicate what is often overlooked in the midst of work life. But studying designers as they live the phenomena of interest, such as how they actually learn in a variety of ways, under real-life circumstances, can offer an important source of data and help provide a more informative account. Finally, while this study emphasized informal workplace learning in general, future research could arrive at additional insights by examining specific aspects of design work and the kinds of learning that they entail. For example, a more focused exploration of innovative learning, perhaps with regard to specific topics such as designing constructivist learning environments, could offer a better understanding of how resourceful designers find ways to solve problems and produce designs that meet specific expectations. Case studies or other kinds of inquiries that probe deeply into the innovative practices of instructional designers might shed light on design in general, in addition to design work in education.

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