Essay:
Educating for an Instructional Design and Technology Future

Sonja A. Irlbeck, Capella University

In the first issue of The Journal for Applied Instructional Design (April 2011), Wagner challenged the instructional design and technology profession to consider what it is we do as a profession. Wagner asked, "what do YOU think an ID should be able to do? Are we technologists? Psychologists? Evaluators? Programmers? DO we need business skills? Theoretical cognitive skills? IT skills? Are we artists or engineers or a little of everything in-between?" (p. 37). Educators and professionals in instructional design and technology (IDT) are becoming aware of an emerging message that IDT is changing as a profession – in Wagner's words, one that is embracing a level of technology proficiency, an awareness of design, and an ability to communicate (p. 37) along with traditional skills about knowledge of theory, models, and processes. If the tasks being embraced are evolving, how are these changes being conveyed to new instructional designers wishing to enter or move further in the profession? The goal of this essay is to launch a conversation about changes in the ways IDT concepts are taught and a possible career path for those entering the instructional design profession.

The Past informs the Future

Professionals who have contributed much to the idea of the changing profession (Dijkstra, 2000; Jonassen, 1997; Reigeluth, 1999, 2009; Silber, 2007) echo the message that IDT is a form of problem solving. Christensen and Osguthorpe (2004) expressed the concern that it is not known how instructional designers actually make instructional design decisions, raising doubts about whether ID processes are as procedural or prescriptive as once thought. Ertmer and Stepich (2005) referenced a key point by Jonassen that "ID is a complex, ill-defined skill that is largely (perhaps entirely) dependent on the context in which it is done" (p. 38). Christensen and Osguthorpe acknowledged Reigeluth, in that he "emphasized that prescriptive theory concerns what the instruction should be like, while the ID process outlines how to plan and prepare the instruction" (p. 46). Silber (2007) reinforced these changing ideas when stating that "ID should be taught as ill-structured problem solving rather than as a procedure, using appropriate methods" (p. 13). Kim, Lee, Merrill, Spector, & van Merriënboer (2008) indicated that teaching and learning are moving "from a content-centric perspective to a user-centric perspective" (p. 808), resulting in a shift from what is done with the content toward greater awareness of context and processes of learning.

The shift away from having content presented is true for how IDTers work as well, in that interventions are designed and created rather than content being presented. If teaching and learning paradigms are changing, instructional design approaches need to change, and this implies a need for a change in the way instructional designers are taught. If the learning paradigm is changing, then logically it is time for teaching about instructional design and technology to change as well.

Framework to Guide Reflection

Understanding ideas related to instructional design technology, principles, learning, problems, and problem solving set the stage for thoughts presented in this essay. What it means to be an instructional designer and technologist has changed from earlier 1950s definitions to more current understandings of the role. An instructional designer:

> "invents, conceptualizes or creates concrete products or materials for instructional or educational purposes … is responsible for the educational, instructional, or pedagogical aspects of the product… is able to reflect on his or her work" (Visscher-Voerman & Gustafson, 2004, p. 70).

The Association of Educational Communications and Technology (AECT) defines instructional technology as "the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning … a discipline devoted to techniques or ways to make learning more efficient based on theory but theory in its broadest sense, not just scientific theory" (AECT: 2.What is the Knowledge Base?, para. 4). These concepts – design, development, evaluation, processes, learning – are akin to those used by Visscher-Voerman & Gustafson (2004) to describe the role of an instructional designer. These roles seem to be merging.

Jonassen (2002) explored complexity as it relates to instructional design and determined that "Problem solving is not … a uniform activity" (p. 110), hinting that prescribed procedures no longer fit the needs for IDT. Absent the premise of uniformity in instructional design processes, how can one determine skills and principles that instructional designers and technologists need to know in order to practice their profession? How does a principle-based approach help solve instructional design related problems? The challenge for the instructional design profession is to find ways to help instructional designers and technologists learn how to perform in the profession – that is to rely on early experience, demonstrate skills, apply and integrate – to integrate stable principles and problem solving to reach an instructional design solution.

The positioning of concepts related to problem solving compared to following procedures for instructional solutions creates opportunities to explore learning and teaching in new ways. These opportunities help advanced instructional designers focus on a variety of solutions and approaches to enhance learning (divergence) rather than strive to have the learner achieve a predefined goal (convergence). Generic steps for problem solving strategies are skills that enable advanced instructional designers to understand and implement complex learning interventions. Problem solving skills should become a part of the advanced instructional designer's toolkit, and these problem solving and design skills need to find a systematic way to be conveyed to novice IDTs.

Experience Guides the Discussion

Sims & Koszalka (2008) began to address advanced roles and skills instructional designers may need with the point that it "may no longer be the instructional designer's role to define, but rather … to enable [emphasis added] the individual participants to adapt the learning environment to their individual and contextual needs" (p. 573). Current thinking embraces the idea that IDT is a field of learning sciences as suggested by Jonassen, Cernusca, & Ionas, (2007). More than a decade earlier, Jonassen (1997) made the point that instructional design is a problem solving process, and ill-structured problem solving can be thought of as a design process, rather than a systematic procedure for problem solutions (p. 79), ala the instructional design systems approach of the past; and Dijkstra (2000) made the point that design problems are "more challenging than more directive and confined learning tasks and goals" (p. 218). The IDT experts in the profession are beginning to voice the similar refrain that IDT is not about process and procedures but about creatively solving learning challenges.

A strong theoretical foundation is needed to support this potential transition and promote further discussion by the IDT profession. IDT was and is informed by cognitive psychology literature where the premise is that teaching involves well-structured procedures (Silber, 2007, p. 11)… but a significant development in the past five years has resulted in a move away from cognitive psychology literature and/or information processing theories as evidenced by ideas that "Content has become readily available and rich in representational formats" (Kim, et al., 2008, p. 808), which is creating a shift "from a content-centric perspective to a user-centric perspective" (p. 808). This shift calls for changes for considering what is done with the content, not the content itself, and this shift begins to change theories and foundations of IDT prac-

tices. As Kim et al. (2008) emphasized, "...learning tools are changing. Learning tasks are changing. Learning perspectives are changing" (p. 811). Changes regarding learning from an acquisition of artifacts and the ways in which learning is beginning to occur need to inform ways in which IDTers begin the transition from historical process stages to more advanced stages of divergent thinking about learning interventions.

Embracing these ideas moves thinking about instructional design solutions away from communicating with learners and toward engaging learners in learning processes. Sims and Stork (2009) reinforce this concept when they emphasize that "the role of instructional design needs to be repurposed so that predefined assumptions about the learner are struck from the design process and replaced with an emphasis on what a learner might or could do with the content and activities to achieve course objectives as well as their own educational goals. … instructional designers must create plans that allow learners to impose their own socio-cultural contexts to the course strategies and content" (p. 1). This is indeed a paradigm shift from the traditional approach to IDT.

Emerging Career Ladder for the IDT Profession?

Based on the previous points, the time has come for considering a continuum of instructional design roles, skills, and areas of influence. Regarding instructional design, Kim, et al. (2008) made the point that "At the master's level, the emphasis should shift from training students to be users of instructional technology to preparing them to manage, supervise, and inspire those who use instructional technology…" (p. 814). Consider the medical field that also extensively uses problem solving skills. In the medical profession, one finds general practitioners, physicians' assistants, and specialists, nursing assistants, nurses, nurse practitioners and other medical personnel. Using this analogy is the master's level instructional design student the physicians' assistant and/or the nurse practitioner of the instructional design field and those who use instructional technology the nursing assistants, lab techs and other medical personnel? Kim, et al. expand on these thoughts when they make the point that

A doctoral student in instructional design should be able to identify, modify, and develop an instructional design theory (this corresponds to an advanced instructional design competency….). … should conduct extensive product and research literature reviews related to the theory of interest…. Conduct additional original empirical research related to the theory development…. Also develop tools that implement the theory in an appropriate context or setting…. Demonstrate use of … tools for the design of instruction and evaluate or supervise the evaluation of instructional products developed by the use of these tools in a field setting (p. 814).

Given the analogy of the medical profession and recent expectations related to highly trained instructional designers, an IDT professional with an advanced degree may be considered equivalent to a general practitioner or medical specialist with additional training and experience required to participate in higher level problem solving activities espoused by experts in the field. A continuum of education and experience in instructional design and technology needs to be explored that helps move an IDT professional from early practitioner stages to later scholarly, visionary and complex problem setting and solving stages.

Ertmer, Stepich, York, Stockman, Wu, Zurek and Goktas (2008) conducted a study that "examined how instructional design (ID) experts used their prior knowledge and previous experiences to solve an ill structured instructional design problem" (p. 17). Based on results of their study, three specific strategies were suggested for educating designers:

(1) helping students conceptualize the key issues in an ill-structured problem by scaffolding their analysis efforts to be more expertlike; (2) helping students accumulate a variety of ID experiences, directly or vicariously, that they can draw on when faced with an unfamiliar design situation; and (3) enabling students to index these experiences in a way that facilitates efficient recall of relevant cases and principles when solving future ID problems (p. 38).

Conversations about career ladders and changes in the way IDT is taught are beginning to occur. Hokansen (2012, in press) suggests a teaching and learning approach that has been in practice for some time, that of the design studio. "The studio/critique system can be mapped to various mainstream educational concepts. The design studio itself is comparable to problem-based learning, where complex challenges are posed to learners in various domains. Learning through solving authentic problems is valuable, both in terms of content and in the development of higher order thinking." (p. x). The implication is that education and professional development of IDTers moves from a focus on technology and process to ideas related to principles and learning sciences, strategizing and com-

plex problem solving. The challenge for the profession is to consider the continuum of knowledge and practices that depict the journey from novice to advanced instructional designer. This continuum is beginning to evolve as denoted by recent terms and descriptions such as designer by assignment, faculty designer, web designer, media technologist and others.

Merrill (2002) coined the term "designer by assignment" to denote someone with content expertise whom is given the role of designing and developing a learning intervention for a specific situation, content area, and/or industry. This designer by assignment may align with earlier described practitioner roles of instructional design, similar to the earlier medical analogy of the intern, nursing assistant or lab technician in relation to the general practitioner. Designers by assignment have knowledge of their fields and some specific skills to help them accomplish limited design and development. What are the educational and experiential requirements to move beyond this level? There is both room for and a need for various levels of instructional design expertise and practice within the profession of instructional design and technology.

Smith (2008) and Rowley (n.d.) point out a gap in professional preparation of IDT professionals. Rowley emphasized "there are large numbers of jobs for instructional designers with a bachelor's degree in instructional design. Additionally, many instructional design positions are held by SMEs, writers, software engineers, and others who are capable but uncredentialed in instructional design" (p. 1). The rungs of this potential career ladder are reflected in numerous paradigms in which IDTers find their work. How does the instructional design profession relate to career ladders in other problem solving professions? Vischer-Voerman and Gustafson (2004) described four paradigms about "different design approaches to different basic types of design paradigms, each reflecting different stances toward the world in general, and toward design in particular" (p. 76). The four paradigms are

Instrumental paradigm: planning-by-objectives.

Communicative paradigm: communication to reach consensus.

Pragmatic paradigm: interactive and repeated tryout and revision.

Artistic paradigm: creation of products based on connoisseurship. (p. 76).

These paradigms are reminiscent of various work-related environments and build one upon another from the designer by assignment to the high level IDT problem solver. Table 1 provides a point of reference to begin exploring ideas about how the paradigms fit into levels of specialities or roles related to instructional design.

The role descriptions in the previous table could be presented as continuing rather than discrete contexts, giving credence to the idea of a continuum or career ladder, indicating novice to expert and laying the foundation for the notion of beginning to more advanced skill requirements and theoretical foundations. Each level, setting and outcome calls for a different set of competencies. Each rung of the career ladder implies that earlier skills inform skills needed on the higher/more advanced rungs. It may be time to focus attention on both the lower rungs and upper rungs of the career ladder as certain skills benefit various levels of specialization. Now may be the time for the IDT profession to consider a system where early competencies are shown to be mastered as one moves on to more advanced levels of instructional design expertise.

A Call for Further Discussion

Sims and Koszalka (2008) emphasize that

> … when considering existing sets of competencies for the instructional designer, we also must be very aware that significant social and technological changes are impacting the way we teach and the way we learn. As a consequence, it is essential that those who practice instructional design build new understandings of emergent learning environments to ensure that their practice is current and relevant. (p. 574)

If you concur with the previous quote, carry it forward by exploring how future IDT professionals are being taught in order to ensure their practice is current and relevant. Sims' and Koszalka's perspectives lend credence to the idea of higher level scholarly and strategic thinking by advanced instructional designers which implies skills to be gained through experience and higher education. The concept also brings us full circle to skills and competencies needed by both beginning and more experienced and highly educated IDTers. Is it time to move away from emphasizing the time-worn ADDIE framework and various procedural approaches for instructional design toward an instructional design world that emphasizes an epistemological approach of constructivism and focus on problem solving skills and principles, thereby helping ensure more effective learning and performance outcomes? The time has come for the instructional design and technol-

TABLE 1	POTENTIAL INSTRUCTIONAL DESIGN PROFESSIONAL LEVELS AND PARADIGMS		
ID PARADIGMS ALA VISCHER-VOERMAN & GUSTAFSON (2004)	POSSIBLE LEVEL OF IDT SPECIALIZATION	PROFESSIONAL CONTEXTS	EDUCATION LEVELS
Instrumental paradigm	Designer by assignment	Public school teachers; Curriculum and development leaders; Manufacturing/task orientated businesses; College faculty	Bachelors Content expertise in a field (experience or master's degree)
Communicative paradigm	Human performance improvement professionals; Technology specialists	Human performance technologists; Business analysts; Curriculum specialists; Instructional designers; Project managers; Process improvement specialists	Masters
Pragmatic paradigm	Efficiency consultants; process improvement specialists; Training directors	Human performance technologists; Course development leaders; Managers of online course development	Masters and Doctorate
Artistic paradigm	Cutting edge of thinking about web-based learning; new technologies; new paradigms about learning	Higher education; Education entrepreneurs; Visionary education leaders; Advanced instructional designers	Doctorate

ogy professions to determine how to achieve what Kim, et al. (2008) described as performance and "instructional models [that] will become more flexible with regard to time, place, and content and will also allow for richer varieties and mixes of learning support, including more support for guided and self-directed learning" (p. 810).

The instructional design profession has the expertise to devise ways to begin to migrate procedure-based approaches to the foundational archives and historical roots of IDT and begin to help emerging instructional design professionals focus on complex problem-solving approaches, consider learning sciences, re-focus on learning (rather than teaching), and promote a paradigm shift for the instructional design profession. Reflecting on visions articulated by professionals who have "lived" the early years of instructional design (Jonassen, Merrill, Moller, Moore, Reigeluth, Silber and others) will help create a path toward principle-based instructional design and high level performance-based problem solving, integrating the use of technology to further impact performance and learning.

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