

## **Theory and Practice in Instructional Design**

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One has to be struck by the diverse nature of university programs that offer instructional design degrees. We have Instructional Systems Programs, Instructional Technology Programs, and Educational Technology Programs, all with slightly different curricula, drawing students from diverse populations, and headed for different employment venues. Common to all programs is that graduates will be confronted with instructional or learning problems they will be expected to solve. In solving these problems some instructional designers will apply a design model they learned in their graduate programs. Others might have to apply a model used by the organization where they work. Still others will engage in evaluation or research projects, where they will have to develop a model to fit the situation. How can an instructional systems program help prospective graduates to meet each of these challenges?

The thesis on this paper is that we must provide our students with a toolbox of both skills and theory that are adaptable to a variety of learning environments. What is in the instructional designer's toolbox? If we look into a carpenter's toolbox, we'd expect to find a square, hammer, saw, tape measure, drills, screwdrivers and chisels – tools of the trade. These tools do the basic jobs of cutting, shaping and fastening wood. The basic tasks of an instructional designer are learning task analysis, learner analysis, learning activities (strategies) design, and learning assessment. What do we look for to determine if our graduates have these tools, and how do we help them acquire them?

Of course it's our desire to prepare our graduates to be productive and employable when they leave our programs with a degree. Masters students are generally viewed as entry-level designers, and doctoral graduates will go into research positions in academia, or business and industry. Each position requires different levels of knowledge and skills. We can teach our students to apply design models, but they must also know why they work. What will prepare them to think most reflectively about what they will be doing? Can our designers answer the question, "Why should the strategies/ materials/ methods I am designing using (whatever model), make a difference in how these particular students learn?" In order to answer these questions students must have a theory of how people learn, and the factors that affect learning.

### **Legacy models**

It seems we are at no lack for models in instructional systems. Most ID models are based on one or more theories of learning or instruction. For example, linear small frame programmed instruction was B. F. Skinner's expression of Behaviorism. The Dick, Carey & Carey model is an expression of the information processing model as interpreted by R. M. Gagne. More recently, theories like Situated Cognition and Authentic Learning have led to design models for anchored instruction (CTVG, 1992), and Social Cognition theories underlie models for collaborative learning and learning communities. The questions for designers are how to optimize the effects of the learning environments through the application of the principles derived from the theories.

A cursory web review of the descriptions and curriculum for ID programs indicate that master's students usually get one survey course in learning and cognition. The learner in these courses is typically exposed to a number of different learning theories,

but it is not likely that the theories will be translated into instructional design models. Most ID programs have multiple “hands-on” technology courses. Often, these courses focus on the application of technology, or a design model with only a cursory discussion of the underlying theories. Students come away from these courses knowing how to hammer a nail, but with little understanding of how a nail holds the wood together. But what is the importance of theory in a field mostly dominated by practice? The importance, as expressed by Nealon & Giroux (2003), is that we all have opinions – personal beliefs about the nature and causes of phenomena, but, “Unless we can ask theoretical questions ... about the origins of knowledges [sic], who holds them, and how such knowledges were formed and might be changed – we’re stuck in a go-nowhere exchange of opinions: he said, she said. (p. 4)” The importance of theory is that it makes us question our existing opinions. If we believe that how we think determines how we act, the importance of theory becomes clear.

For example, opponents of traditional models of instructional design, such as the Dick and Carey model, claim that they are linear and objectivist and that they are somehow inadequate. Some opinions I’ve heard expressed are, “there are too many steps and they are too tedious”, “they lead to one-size-fits all instruction”, and that “behaviorism is an outdated theory.” These are all descriptions based on opinions about the models, and global generalizations about the adequacy of their foundations. However, opinions about the models and criticism of the theories are confounded. The logistics of practicing the model shouldn’t damn the theory. Just because the model contains “learning objectives”, doesn’t mean the instruction produced is based on Skinner’s model of operant conditioning (if our students even know what that implies).

What we think, determines what we do. However, if we aren’t critical about our opinions, or what we do, we don’t grow intellectually. Critical thinking is a necessary tool if our students are going to “construct” theory, and knowledge from relevant practice. To paraphrase Nealon and Giroux, we are interested in theory as a toolbox of questions and concepts to be built and experimentally deployed rather than as a menu of methods to be chosen and mechanically applied.

Recent research by Christensen and Osguthorp (2004) found that only approximately 50% of the respondents report using theories in making instructional strategy decisions. Does this mean they don’t reflect on the efficacy of their practice? Another interesting finding of their study is that the most frequently cited sources of new instructional theories, trends and strategies are peers or co-workers. Does this imply our programs need to engage in more continuing education? They also found that as a group, ID practitioners do not rigidly subscribe to either objectivist or constructivist philosophical biases, from this Christensen and Osguthorp conclude ID has migrated away from its objectivist roots (p. 64). How might this inform our program decisions?

### *As the paradigm world turns*

Recently, it seems, other programs are infringing on what was instructional design territory. Educational psychology has become learning sciences, library science has become information studies, and communications programs have started teaching courses in multimedia design. Educational psychologists, by designing instructional materials for public schools, have attracted money from the National Science Foundation. Among other things, research money will get the attention of academicians. Cognitive science, as

defined in the study of situated cognition and anchored instruction, became an underlying theory for authentic instruction and learning communities. Since instructional design models reflect educational theories, it wasn't long before the methods associated with design began to change to accommodate the new theories. Was instructional design too slow to see new applications, or was it lacking the theoretical perspective to lead this field of inquiry?

How did this affect instructional design? Theories supporting self-paced, replicable instruction were out, collaborative learning was in, and the models of design for individualized learning materials were no longer seen as relevant – How people think affects how they act. However, nothing within an established program changes all that quickly. Instructional design had never really penetrated public school instruction anyhow, and the legacy models still worked in many venues with clear learning outcomes. Instructional designers, at least FSU's Masters graduates, mostly go into business and industry to design training, so we still teach the classic models, based mostly on information processing theory. However, the currently popular educational psychology paradigms became the foundation for new ways to conceive of instructional design, and systems programs have picked up on the need to design learning environments (in the broad sense), and the social-cultural theories have become foundations for new models of design, as suggested by Christensen and Osguthorp.

“It seems we live in a world of ‘posts’: we’re post-modern, post-industrial, post-feminist, post-colonial, and, given the advent of e-mail, perhaps we’re becoming post-post office.” (Nealon & Giroux, p. 125.) Nealon & Giroux conclude it is “some deliberate sense of indeterminacy or uncertainty that would seem to make an artifact postmodern” (p. 129). Are we entering a period of post-instructionalism? Is a postmodern paradigm appropriate for educational institutions that reflect our culture? What does it mean for an educational institution to be “post-modern”?

### *Professional identity as an instructional designer*

Our identity as practitioners is reflected in our identity as a discipline. Are we cognitive scientists, or materials developers? Are we learning architects or builders of learning environments? This is a current thread of discussion on the *ITForum* as I type this paper, Is there really an identity crises? Andy Gibbons sees us as interventionists, i.e., we apply a process to a problem to affect an outcome. Like a doctor, when we intervene, and what remedy we apply depends upon a diagnosis of the symptoms of the patient, the progress of the disease. However, even doctors as practitioners depend upon a theory of disease for the design of successful interventions. What are our core theories? How robust are they?

I am presently on a curriculum committee that is considering what the Master's program should be. What courses should a student be required to take? What competencies will they have to demonstrate in their portfolio? What should an entry-level instructional designer be able to do? These questions all relate to identity. How do students gain an identity as an instructional designer and how do we know when they have this identity?

### *The roles of Instructional Design Programs and Professors*

First, we work at two different levels. At the Master's level we produce practitioners. They learn the models and some of the related theory, but the emphasis is on the practice. At the doctoral level, the emphasis switches to a more theoretical level, as it should, for the preparation of researchers. As professors we author or identify the knowledge we expect our students to know. First, we want them to know what we have found to be useful. Second, we want them to be able to talk and think like we do. When they identify with us they also gain identity as instructional designers, and we validate their knowledge. However, in order to continue to develop theory we must be able to question our assumptions and encourage our students to do likewise.

One question we might consider is; how would we certify an instructional designer who didn't come through one of our formal educational programs? How would we recognize whether they had the skills? What evidence would convince us that this person was truly an "instructional designer?" Of course every teacher designs instruction, but they aren't "instructional designers". What sets us apart? I'd contend that it is our beliefs about learning and instruction, our theory – as well as our practice or methodology.

### **A changing but resistant culture**

The culture of instructional design has changed and grown from when I first entered the field. The technology has changed, and models of instruction have changed. Information is available from many more sources, and we have production capabilities on our desktops that were unavailable 30 years ago. These technologies extend our capabilities to communicate, publish, and retrieve information. Slower to change are educational institutions, but they are changing. Students are hooked into the technology, so they expect more services. Teachers know they can't continue to ignore the technology, and they are no longer the only authoritative source of information.

At the same time new technologies are clashing with traditional structures. Whereas authority used to rest with the teacher in the classroom, it is now moving to a higher level. Legislatures are developing or contracting for exit exams for high school. Check out the accreditation requirements for universities. Look at "academic learning compacts" that require measurable learning outcomes for undergraduate courses. Consider legislative mandates for block tuition and "standardized" university exit exams. Faced with accountability for student performance, how will teachers and designers incorporate new thinking into public education?

### *ID career paths*

Instructional designers work in amazingly diverse venues. Today, I am the coordinator of faculty development at FSU. The modest mission of my unit is to improve instruction on the campus of FSU. This means offering personal consultation to faculty and Teaching Assistants, offering professional development workshops to help faculty integrate technology into their teaching. It involves thinking about instruction and learning, and the effects instructors have on students through their classroom curriculum, policies, and procedures. I often reflect on Carroll's model of school learning, and Keller's ARCS models when I attempt to diagnose instructional problems. I don't design

instruction for faculty, but I can help them think about what they want their students to accomplish, and how they might help them learn.

If using technology can help improve instruction, great, but many problems are far more basic, for example, creating a syllabus that clearly communicates course expectations, or explains assessment and grading policies. It means explaining how instructors communicate respect and concern to their students. This position has convinced me that as an instructional designer, theories about organizational behavior, change, and diffusion/adoption are far more relevant than I thought they would be at the time I studied them. I perceive myself, as Rick Schwier described in his paper, as a change agent. The people I work with acquire new perspectives, and reflections on what it means to be a teacher. But changing an individual's present practice is tough. You have to work within the parameters of that person's culture. Helping people change requires good theory, and a practical way to apply it and see it work.

I view instructional designers as problem solvers. A good problem solver has a toolbox of knowledge and skills based in theory. A good problem solver learns from experience. A good problem solver knows how to determine the difference between opinion and theory. A good problem solver knows how to use the different tools in the toolbox to effect different results. There is no one best way to do everything, and a good instructional designer can consider the situation, the desired outcomes, and select or develop a means to facilitate the outcomes.

What should an instructional designer know? What should an instructional designer be able to do? These are the questions that require us to investigate our opinions, and the actions we take on them. I never want to be completely comfortable with regard to what I know or what I believe as truth. It doesn't take much to see how quickly knowledge changes. But on the other hand, I don't want to discard a good tool simply because a new one is available. I might watch others use it, see what they say. Try it out for myself, see how it works. If it is better than the old tool, keep it and learn to use it wisely. If not, stick with what works. And, if I should find something that works better, share it with others.

## References

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