

Teaching a Design Model vs. Developing Instructional Designers

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Coming from a background in the visual arts (MFA, Printmaking, 1983), I was puzzled when I began to work in instructional design and technology by the apparent centrality of design process models to the overall enterprise. While every field incorporating design uses and teaches processes for design, most do not seem to view the design process itself as a central object of focus in teaching and learning design. The focus of teaching in these fields is centered on developing habits of mind within those who will be designers, using design activities as the primary focus and design models as one possible support for those activities. In discussions with colleagues in the IDT Futures group we have speculated on why this may be so – we want to be seen a scientific ally-oriented field instead of craft- or arts-oriented one; we have traditionally embraced systems and communication theory, which tend to place process models front and center; our models started out as conceptual frameworks and were only hijacked later as convenient vehicles for teaching; and, perhaps my favorite, there are simply not very many actual designers teaching in our field so the use of models in the classroom substitutes for the kind of expertise that would allow for any other approach (e.g., apprenticeship). But the discussion begs another question: does it really matter if we teach design differently than they do in other fields? I believe that it does matter to the extent that we are not satisfied with how we teach design and feel the need to examine other options.

Let me say at the outset of this section that the students in our graduate program who are studying to be designers are some of the finest in the world. While most of them do not bring any formal design experience with them to the program – indeed, many deny even having had much informal design experience prior to their studies in instructional design – most of them are clearly eager to be designers of instruction and hungry to be imaginative, creative designers of good instruction; instruction that will do its job well. I admire them for their drive, their intelligence and their ability to master new concepts and skills. They learn quickly. They study hard. They take whatever is available in the learning environment and wring the juice from it.

However, I am troubled by some of what I see happening to my students as they move through the program. Generally speaking, they seem to be timid about venturing outside the design process. Some clearly expect the process to yield acceptable results simply because it has been followed rather than because it has been used as a powerful tool. They often ignore their own intuition about what might be important in a design situation, and sometimes set aside very thoughtful observations because they cannot cite an author who has validated those observations previously. They have well-functioning imaginations but frequently do not apply them to problem solving, and when asked why not, reply that they weren't sure a particular innovative approach to the problem would be valid instructional design practice. They do not seek out examples of instructional design and generally do not make any but a small personal collection of cool instructional strategies that they can draw upon for new design problems. They invest sparingly in the generation of design alternatives, expecting that they can reason their way to an appropriate design and seeming to regard as a mistake, or a waste, any work that does not feed directly into the finished product. And they often seem disappointed in their own

efforts, dismayed at the gap between what they expected to produce and what actually came to be and at a loss to turn the current design experience into fruitful learning for the next one. Let me remind the reader – these are students I respect and students who graduate, I believe, as some of the best-prepared designers in the field. But I want more for them and more for the field.

I have worked on filling in the “black box” in the design process (Kerr, 1983), thinking that when students could separate function from form and manipulate those constructs as a bridge between the instructional strategy and the instantiation of the strategy that they would be freed to examine alternatives, generate new forms, apply their analyses meaningfully. This has been helpful in some ways, but has added steps to the process model rather than reducing the tyranny of the model. I have also instituted critiques and design journals (for collecting design examples, reflection on design and sketches – both text and image – of design ideas) as staple activities in my beginning ID and production courses. Students feel some utility from critique – they get feedback – but most are mystified by the design notebooks. The critiques allow us to practice critical review of design and definitely show promise as a teaching tool, both critique and design notebooks feel incomplete when they are grafted on to an environment in which transformation of the self is not expected. Finally I have removed the design process model from my initial ID course and recast analysis as a research project in which the students are striving to immerse themselves in understanding the context for the proposed instruction in all its facets. Again, the change shows promise, but the students are probably frustrated because it seems to them as though the process – that central focus of learning ID – is simply getting fuzzier. Bear in mind that these are classes in which the students practice hands-on ID and production. They operate as “novice professionals” and tackle entire design problems, not bits and pieces of the process taken out of context. In other words, I have not been grafting studio-like activities onto course that are otherwise lecture-oriented, or limited to teaching software applications or single topics (analysis, design, evaluation). So I ask myself, is something else missing in the way that we prepare individuals to be instructional designers? And could we learn something about what might be missing from those who teach designers in other design fields?

First, what do I mean by design?

A misconception that seems to arise when I address the issue of how we teach design is that, since I am a visual designer of media, I must be speaking primarily of visual design – or perhaps message design – when I say “design.” A second misconception arises among those who have so little themselves to do with media design that they assume I am speaking of instructional design in the narrowest sense – that of making instructional strategy decisions within a single design effort. In the context of this discussion my intention is to use *design* in a broad sense to encompass the whole enterprise in which instructional designers labor. If one works as an instructional designer, then one’s work is fundamentally that of design – when design is defined as the *conscious generation of interventions into the experience of others for specific purposes*. I am drawing here from Andy Gibbon’s presentations to the IDT Futures group on how instructional design might best be seen as a form of engineering, or planned intervention in naturally occurring process to meet a specified goal. (See also Gibbons (2003) for more on the relationship between IDT and engineering, and Pitt (2001) for a concise

discussion of engineering knowledge.) However, I use the term “experiences of others” rather than “naturally occurring processes” because the processes in which we intervene as instructional designers are inevitably the experiences of others.

Even if one does not subscribe to Andy’s view of the instructional technologist, it is possible to place our enterprise within the broad scope of design by examining the models used in other fields where the products of a professional’s activity represent an intervention in the lives of others for an intended purpose.

We are different but not unique among designers.

Instructional design models fall into a family of like models or frameworks developed across a number of fields of endeavor. Even though much time and energy could be spent discussing the variations between these models, they are striking to me in their underlying resemblance to one another. Not every field represents these models explicitly, or represents them in spatial form with boxes and arrows, but the basic components are discoverable in explanations of “how we do our work.” See Rowe (1987) on *Design Thinking* for an overview of models for architectural design and Mitchell’s *User Responsive Design* (2002) for a recent update on user-responsive design for architects and interior designers. See the revision of Dreyfuss’s classic *Designing for People* (2003) for an inferred model of what was called industrial design at the time of his first writing, and is more usually called product design now. Review the website supporting a realistic lab-based experience for students at the Staffordshire University School of Engineering and Advanced Technology (2004) to get an idea of the underlying process model being used for their instruction. In the field of human-computer interface design, a design field somewhat less established than IDT, see Beyer and Holtzblatt (1998) on *Contextual Design* and compare the major activities described there with those typically covered by ISD models.

Product designers, graphic designers, architects, software interface designers and engineers all carry out analysis in the early stages of their process – analysis of those who will use their designs, of where and how the designs might be used, of the critical vs. desirable features for the designs, and of the desired outcomes for them. All examine the design alternatives in the light of the analysis data they have collected. All narrow those alternatives through the understanding of constraints – in materials, time, budget, acceptability of certain aspects of a design, mandates from clients, and appropriateness of the solution for the problem specified. All face the transition from concept to instantiation – from design to development and production in our terminology – and all consider the implementation of the design to be part of the process. Although the goals they work toward differ in their character, all these designers incorporate evaluation into both the pre- and post-implementation phases of design (formative and summative), whether their evaluation activities would be considered adequate or on-target by instructional designers or not.

Design activities generally present in the models	Some equivalent IDT activities
Define the problem	Needs analysis, HPT analysis, stakeholder analysis
Conduct research	Needs analysis, context

	analysis, audience analysis, task analysis, content analysis, SME consultation, technical analysis, comparative product review
Identify potential design solutions	Instructional approach, instructional strategy selection, sequencing instruction, motivational strategy design
Select solutions in accordance with constraints and goals	Prototyping, formative evaluation, expert design review, SME review, media selection, implementation planning, change management planning, technical feasibility tests
Build the design	Development, production,
Test	Quality testing
Deliver	Implementation, change management
Refine, redesign	Evaluation, implementation, analysis

Table 1. Comparison of design activities carried out by most designers and by instructional designers

The emphasis within various parts of the design process is different in each field, as it should be. The detail of terminology is different – and can be quite confusing when the same words are used in different ways (“design” for example). But the functional description of what is getting done when a person sits down to create something that will be used by someone else for a certain purpose is pretty much the same.

I do not argue that our process model should be the same as anyone else’s, nor theirs the same as ours. I do not argue that the processes in other fields are more or less effective than in ours, or that any field has a single model that can be held forth as the one by which it should be judged. I do claim that ADDIE represents just what Walt Wager tells us it was originally meant to be – a conceptual framework for the design enterprise. In fact, although academics would immediately start arguing over the details, ADDIE could be seen equally well in any field of design as the basic conceptual framework for design activity. Even quasi-radical departures from what might be called “traditional ISD process” contain ADDIE components when those components are viewed as constructs that define the purposes of design activities. This being so, I argue further – and in company with Gordon Rowland (1994) – that we can learn by examining the practice in other fields of design, including the ways in which they teach people to be designers.

Learning to be a designer outside of IDT

My own graduate experience in fine arts was an apprenticeship experience (Boling, 2003). See the series of short papers, Design Cultures, in the *IDT Record* online for additional descriptions of learning and teaching design in various fields at http://www.indiana.edu/~idt/shortpapers/documents/design_cultures.html . Because of this experience, I am aware of how very different teaching design can be from what I have observed and been part of within the field of instructional design. However, I am not proposing to apply a studio art model directly to instructional design. In this culture, studio art is understood to be driven largely by the personal goals of the artist. Instead, I look to several discussions of learning design in fields where designers are expected to generate interventions for purposes that are either driven by a client or arrived at jointly between a client and a designer. In particular, I will consider graphic design (Heller, 1998), engineering (Platts, 2004) and architecture (Anthony, 1999; Lawson, 1997).

In a series of interviews Steven Heller (1998, pp. 179-207) asks prominent graphic designers how they learned to design and how, if they teach, they teach design. Prominent among their responses is that they learned from role models, either in school or outside school, and that they attempted to emulate the kind of person that the role model was – not necessarily to emulate the designs that person produced. They also said that they learned from their mentors profound insights into the *meaning* of design – not that they learned a *process* of design. These designers mention a mentor who showed them the work of other designers and made them conscious of what was important about that work. They point to the independent thought required of them, to the expectation that they would develop their voices as designers and to the commitment their mentors had to design. In discussing their own teaching, they talk about technical methods, but more about teaching designers to be ethical, to define their own talents, to understand the world, have passion for design, acquire their own voices, be “agents of their own making” (p. 193). Reading these descriptions reminded me of Rick Schwier’s investigation elsewhere in this chapter of the big vision of instructional design, the overarching passion that he did not always find expressed by the instructional designers in his study. It also pointed to the notion that teaching design in this field is concerned with transforming students into designers, rather than teaching students the process of design. The nature of the change in these students is clearly not a simple accretion of technical skills or process competencies. It is a change in their perspectives, activities and selves.

K. W. Platts (2004) introduces a case study describing a learning laboratory at the university of Cambridge with a discussion of the required knowledge and skills for designing manufacturing systems. He explains that both Eurault’s type A knowledge which is declarative (p. 206), and type B knowledge which is “the knowledge that professionals bring to their practice that enables them to think and perform on the job” (p. 207), are required for engineers in this domain. Also required are “skills of synthesis” that enable them to put what they know together effectively within the constraints of a design situation. The third requirement stressed by Platts is judgment. Designers need to judge the reality of a situation, make value judgments about objectives and make action judgments about what to do (p. 207). The laboratory environment that he describes for teaching these requirements to engineering students places them in charge of designing and running an actual manufacturing system; the students themselves plan and monitor

their work, meet their own process requirements and consult experts with process problems on an as-needed basis. They have to decide what to find out, how to apply what they know, and how to measure their progress. The emphasis is definitely on the development of judgment – which is an aspect of instructional design not covered by the process models.

In her discussion of design juries, Anthony (1999) likens the teaching process in architecture to that in fine arts – a studio environment where all students work within the same space, setting their own process and focusing on a variety of activities leading up to the design jury, a public critique and oral defense of their work. In this environment, the student learns what kinds of issues will be addressed in critique through observation and practice, and then uses whatever resources he can learn about or imagine to address those issues during iterative bouts of design. Lawson (1997) has proposed a 3-dimensional model of design problems (not design process) that describes the stakeholders involved in a design problem on one axis (designer, client, user and legislator (decision-maker at the level of society)), the source of constraints on another (internal and external) and the aspects of all design problems that must be considered on the third (radical (basic), practical, formal and symbolic). This model offers the designer a space in which to define the interrelated aspects of the design problem rather than a process by which to tackle the problem and seems to capture the flavor of design learning in the architectural studio. The student sits in the middle of this problem model, responsible for addressing all aspects of it at a level commensurate with their importance for this project. The brief (or problem statement) from which the student designs does not specify the manner in which this process is to be carried out. Emphasis here is on independent problem-solving, generation of previously unknown solutions and the resourcefulness of the student in assembling a rationale for the design decisions that have been made.

But wouldn't students in these fields be better off if they *did* use process models? You're not saying they're perfect?

As might be expected, no field is entirely content with the way in which its designers are taught – or with the ways in which they practice, for that matter. In fact, Anthony's (1999) primary premise is that the design jury requires major rethinking and revamping in order to serve effectively the purposes for which it is presumably used. Mitchell (2002) is likewise clear in his description of effective methods for user-responsive design that architects have not been considering all the issues that they should in designing, or in learning to design. Clearly, each design field struggles with how best to prepare its own future professionals. However, these reservations do not negate the potential for us to learn from other fields.

Again in architecture, Rowe (1987) lays out in some detail the failure of process models. He reviews multiple models of creative problem-solving (design) in their historical context, tracing them from the phase or staged-process models “characterized by dominant forms of activity, such as analysis, synthesis, evaluation and so on) (p. 46) to the cognitive models taking the form of decision trees (p. 53) and top-down hierarchies of problem space (Christopher Alexander's pattern language being the example, p. 71) among others. Among the models he describes, ISD appears to be using primarily those of the staged process variety – even though most of the current models do not expect this

process to be *linear*. Rowe's observation about these forms of process models is instructive and thought-provoking. He says:

... what seemed necessary [at the time of their development] was a clear and logical procedure for producing designs and plans that could be understood and participated in by all those involved. With respect to the former point, what seemed necessary was a far greater understanding of design processes, in order that procedures could be improved. In spite of the very real contributions that were made, at least to our understanding of these processes, in almost all cases the step beyond description to a normative realm in which process became pursued as an end in itself resulted in abject failure. Attempts to devise *the* process became exercises in inanity when compared to the great subtlety and profundity of observed problem-solving behavior.

At least in one other field, models not unlike those we are teaching with now have been developed, taught, tried and discarded for what sound like problems similar to the ones I worry about in my classes. Although I do not accuse us of using these models for their own sake, I do see that they cannot capture or stimulate the "subtlety and profundity" required for good design to happen. So when we use them as a primary vehicle to teach, or focus on them as the core of design activity, we run the risk of ignoring those qualities *required of the designer*. If we ignore those, then we probably don't teach them. And it is not clear that they can be taught directly. The learning environments in other design fields, for whatever their faults, seem to concentrate on developing self-sufficient individuals who are committed to their work, understand its difficulties in a profound way, make it their business to grapple with the complexities of intervening in other people's experiences and have the courage innovate process as well as products. I am coming to the conclusion that we need in the future to teach design more as a vocation, and much less as a process.

Note:

In the notes circulated after our most recent IDT Futures meeting, I see that I spouted off about the comparative lack of interest within our field in how we design and how we should design. Such an observation might seem naïve, given the reams of literature we generate collectively having to do with the design of instruction and models of instructional design. However, when I turn to this literature, it generally has to do with either what should be designed (instructional theory and strategies), or else it does *not* have to do with the actual enterprise of design but only with generalized models or frameworks for design. Some studies also have to do with the degree to which instructional designers are adhering to generalized frameworks of design (e.g.; Wedman & Tessmer, 1993; LeMaistre, 1998). However, interesting exceptions include Gordon Rowland's (1992) investigation of designers at work, Brent Wilson's (2005) discussion

of emotion and aesthetics in instructional design (by implication more than directly), and Kerr's (1983) comparatively early discussion of the "black box" of design.

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