A Scenario-Based Instructional Design Model

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INTRODUCTION

Instructional design models address important issues of learning, content, and context during the development of instruction. The prescriptive premise behind instructional design is that if an *instructional design* is followed, the learning outcomes identified in the design will occur. As one evaluates the extent to which learners achieve learning outcomes, changes in the instructional design may be warranted. Documenting these changes provides designers and users of the model with feedback on its efficiency and effectiveness. Despite these attributes, the merits of *instructional design* have not been achieved in some settings, and some users, including teachers and product developers, are looking elsewhere for instructional development guidance. But should they? The premise of this chapter is to propose a *scenario-based ID model* that addresses a major shortcoming of instructional design—namely, the gap between formative design decisions and design review. *Scenarios* are used to keep people designing, reflecting, and re-designing.

BACKGROUND

Instructional design has been criticized as being too prescriptive, taking too long to use, and not being appropriate to specific design tasks. Early generations of *ID models* attempted to depict one approach to address all instructional problems (see Tennyson, 1995, for a generational history). Some of these linear, step-by-step cycles and flow charts helped to understand the ID process and were suitable for teaching instructional design (Dick, Carey, & Carey, 2005; Morrison, Ross, & Kemp, 2004), while others provided procedural guidance to instructional development (Gagné, Briggs, & Wager, 1992; Tripp & Bichelmeyer, 1990; U.S. Air Force, 1999). Some models were aimed at teachers, particularly providing procedures to develop instructional materials (Gerlach & Ely, 1980; Heinich, Molenda, Russell, & Smaldino, 2001). More recent approaches (Tennyson, 1997) have attempted to model the complexity of instructional development using a more iterative, nonlinear approach.

All of these approaches present a challenge to instructors of ID. Visiting each phase of ID in a linear fashion appears appropriate for novices in a course setting. However, students come to view ID as a linear activity, which starts and ends. ID is depicted as a process that begins with an instructional problem and action is taken to solve the problem. The intensity of the problem is lessened; consequently, there is less action to solve the problem, but the problem remains (Fritz, 1989). A circular representation (Morrison, Ross, & Kemp, 2004) helps to alleviate this linear process, but newcomers ask: "Where does one start?" The circular view is more akin to artists who imagine possibilities; imaginations are brought into reality, inducing the next creation. In the top-down view, the process ends, while in the creating view the process continues. Sustaining the process, whether creating or designing, appears valuable.

Carroll, Kellogg, and Rosson (1991) depict a circular *task-artifact cycle* in software development in which tasks suggest requirements for new artifacts. Designed artifacts then suggest new possibilities and redefined tasks. The main feature here is that human activity drives the process. However, an underlying issue is that design decisions have consequences. How much time and resources should be committed to a decision? With a decision, one commits resources and is likely to remain committed to this option. The challenge is not to shut down the consideration of possibilities prematurely and deny candidate approaches a fair appraisal. One representation of instructional design borrowed from computer programming is *rapid prototyping*. Design an early version with just enough resources, then test the initial version with users, and revise based on user performance and suggestions. Rapid prototyping, however, requires a good "first guess," as one commits to a choice and subsequent investment of resources. The result is not an iterative process but more of a spiraling-down process.

Another feature of development work, involving teams of designers, users, and developers, involves the use of periodic or benchmark reviews. These may be limited to specific technical features of the work without appraising the overall potential of the design to address user needs. Here design reviews stop design. The review focuses on features and functions rather than on potential use. Similarly in ID instruction, reflective critique of students' ID decisions is frequently removed from design activity. In classroom settings in which ID is being taught, students typically hand in design work and make revisions based on instructor feedback. This traditional form of instruction distances students from thinking about responsive design decisions, those that directly impact learners. Student thinking concentrates on instructor feedback rather than focusing on learner needs.

The purpose behind the *analysis* component in instructional design is to give designers sufficient information to make a "first guess." With ongoing information gathering, data collecting, and other analysis or needs assessment activities, more informed design decisions can be made as one develops instructional materials. In general, people want to move to a solution in light of existing experience (Simon, 1996). However, students in ID courses resist analysis activity unless required. Left to their own devices, meaning their skills and experiences, students will move quickly to a design solution and are likely to proceed directly to an option they have in mind.

Analysis as a formal design component prompts designers to think about the context of the problem. *Context* resists analysis because it is complex and difficult to abstract, summarize, and database. A limitation to the development of learning environments which incorporate technology-based tools failing to address the social context of learning, such as the culture of the classroom and the school, and the beliefs and decisions made by teachers in those classrooms. How does one account for context in design? Bielaczyc (2006) suggests a *Social Infrastructure Network*, which examines cultural beliefs, practices, socio-techno-spatial relations, and external interactions. Within the ID field, the problematic nature of *context* has been discussed. Tessmer and Richey (1997) suggest a process of *contextual analysis*, while Jonassen and Hernandez-Serrano (2002) suggest *stories* as a formal case-based means to formalize context.

Thus, thinking about the implications of one's design decisions is an important activity (Rowland, Parra, & Basnet, 1994). Schön (1983) observed that *design reflection* is frequently separated in time from design activity. Depending on the instructional development process used by a teacher, designer, or consultant, significant time may pass between a design decision and a design review. As is common in a college course, usually several days or a week may pass before a student receives feedback from an instructor. A challenge for an instructor is to help students keep their decision making moving forward, but in the context of thinking and reflecting on these decisions given existing information. *Scenarios* are used to address this de-coupling of reflection from design. Bødker and Christiansen (1994) suggested scenarios as a tool to initiate and continue design conversation in the context of the design work itself. Subsequently, Gay and Hembrooke (2004) use *activity theory* as an approach to representing context and placing context in the center of design activity rather than on the periphery. Activity theory provides a conceptual or thinking tool to examine people, work, rules, tools, and artifacts. What would an ID model look like if the model addressed context throughout its process? A *scenario-based instructional design model* (SBID) is described, one variation for newcomers to ID and a second variation for ID practitioners. Such a model would be meaningful in the design of any learning setting, as one model would assist both in the teaching of ID and the use of ID across diverse settings.

MAIN FOCUS: THE SCENARIO-BASED INSTRUCTIONAL DESIGN MODEL

Scenarios are typically used as written case studies, simulations, or a set of options developed by others to serve as teaching or decision-making tools (Schwartz, 1996). Within the SBID, scenarios are user developed, rather than supplied. Carroll (2000) characterizes scenarios as "condensed descriptions" of proposed solutions to instructional needs. Scenarios involve discussions and written descriptions of individual or group decisions. Discussion raises merits and identifies issues and constraints from which participants make improved choices. Outside information can inform the subsequent decisions, but the flow of decisions occurs within a continual cycle of communication. Carroll, who uses scenarios in computer system development,