Design Levels for Distance and Online Learning

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INTRODUCTION

The importance of design for instructional programs — whether on campus or online or at a distance — increases with the possible combinations of students, content, skills to be acquired, and the teaching and learning environments.

Instructional design —as a profession and a process— has been quietly developing over the last 50 years. It is a multidisciplinary profession combining knowledge of the learning process, humans as learners, and the characteristics of the environments for teaching and learning. The theorists providing the philosophical bases for this knowledge include Dewey (1933), Bruner (1963), and Pinker (1997). The theorists providing the educational and research bases include Vygotsky (1962), Knowles (1998), Schank (1996), and Bransford, Brown, and Cocking (1999).

Instructional design offers a structured approach to analyzing an instructional problem and creating a design for meeting the instructional content and skill needs of a population of learners usually within a specific period of time. An instructional design theory is a "theory that offers explicit guidance on how to better help people learn and develop" (Reigeluth, 1999).

BACKGROUND

This entry describes a multi-level design process for online and distance learning programs that builds on a philosophical base grounded in learning theory, instructional design, and the principles of the process of change as reflected in the writings of the theorists listed above. This design model builds on traditional instructional design principles, as described by Gagne (1965), Dick & Carey (1989), and Moore & Kearsley (1996). It integrates the strategic planning principles and the structure of the institutional context as described in Kaufman (1992) and Boettcher & Kumar (1999), and also integrates the principles of technological innovation and the processes of change as described by E. M. Rogers (1995) and R. S. Rosenbloom (1998).

This entry describes a six-level design process promoting congruency and consistency at the institution, infrastructure, program, course, activity, and assessment level. It also suggests a set of principles and questions derived from that framework to guide the instructional design process.

Figure 1. Six levels of design for learning

Six Levels of Design	Design Responsibility	Sponsor/Leader	Design and Review Cycle
Institution	Entire campus leadership and community	Provost, CIO and Vice-presidents	3-5 Years
Infrastructure	Campus and Technology Staff	Provost, CIO and Vice-presidents	2-3 Years
Degree, Program	College/Deans/Faculty	Dean and Chairs	1-3 Years
Course	Faculty	Dept Chair	1-2 Years
Unit/Learning Activity	Faculty	Faculty and or Faculty team	1-2 Years
Student Assessment	Faculty	Faculty and or Faculty team	1-2 Years

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SIX LEVELS OF DESIGN

Effective instructional design for online and distance learning benefits from instructional planning at six levels. Figure 1 summarizes these six levels of design, and identifies the group or individuals usually responsible for the design at that level and the length of the design cycle at each level. Ideally, the design at each of these six levels reflects philosophies of teaching and learning that are consistent with the institutional mission and consistent with the expectations of the students and society being served.

Level One: Institutional Design

The design work to be done at an institutional level is similar to the strategic planning and positioning of an institution. Institutional planning generally begins with an institution's current vision and mission statements and then proceeds through a data collection and input process that addresses a set of questions such as the following:

Institutional Questions:

- What programs and services comprise our primary mission? For whom?
- To what societal needs and goals is our institution attempting to respond?
- What life goals are most of our students working to achieve?
- What type of learning experiences are our students searching for?
- What changes in our infrastructure are needed to match our desired services, programs, and students?
- Does our institution have any special core competencies, resources, or missions that are unique regionally or nationally that might form the basis for specialized online and distance programs? What are the strengths of our mature faculty? Of our young faculty?

Level Two: Infrastructure Design

People often think that buildings, classrooms, Web applications, communication services, and servers are neutral as far as having an effect on teaching and learning. Nothing could be more misleading. Design of the infrastructure includes design of all the elements of the environment that impact the teaching and learning experiences of faculty and students and the staff supporting these experiences. It includes design of the following:

- Student services, faculty services, and learning resources.
- Design of administrative services, including admission processes, financial processes, and institutional community life events.
- Design of physical spaces for program launching events, hands-on, lab, or network gathering events, as well as celebratory graduation events.

Physical and Digital Plants

Infrastructure design for online and distance teaching and learning programs focuses on the design of the network and Web infrastructure. Infrastructures for online learning have offices, classrooms, libraries, and gathering spaces for the delivery and management of learning and teaching. However, these offices and classrooms are accessed through Web services, rather than through physical buildings. The good news about online infrastructures is that they support an unparalleled new responsiveness, feedback, and access for learning activities.

After almost ten years of building online campuses, we now know that a "digital plant" infrastructure is needed to support the new flexible online and distance environments. We know that this new digital plant needs to be designed, built, planned, maintained, and staffed. The infrastructure to support the new programs cannot be done with what some have called "budget dust" (McCredie, 2000). It is not nearly as easy or inexpensive as we all first thought. Some experts suggest that, a "full implementation of a plan for technology support on campus costs about the same as support of a library — approximately 5% of the education and general budget" (Brown, 2000).

Components of a Digital Infrastructure

What exactly is a digital plant infrastructure? One way of describing this infrastructure is to think of it in four major categories of personal communication tools, networks, hardware for servers, and software applications. A key component of the digital infrastructure is the group of individuals who make the systems work. This digital plant is shown in Figure 2 (Boettcher and Kumar, 2000).

Some of the questions that might be used to guide the development of the digital infrastructure follow.

Personal communication tools and applications:

- Will all students have their own computer? Their own laptop?
- Do we expect students all to be proficient with word processing applications, mail, Web applications, researching on the Internet? With collaborative

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