Definition of Development

The domain of development is "the process of translating the design specifications into physical form" (Seels & Richey, 1994, p. 35). Though the physical manifestation of technology is the driving force of the development domain, it is important to note that the development domain encompasses both hardware and software, visual and auditory materials.

An instructional designer may use storyboards and/or flowcharts to present the vision for the development of the product. When selecting the appropriate media for the instruction, the instructional designer might use the Reiser-Gange Media Selection model (1983). The model takes into account the media properties and learning task and uses a flowchart to guide the selection of appropriate media for the specific learning task (Dick, Carey & Carey, 2005).

A formative evaluation is conducted upon completion of the product to correct the mistakes and ensure the effectiveness of the product before it is implemented.

Among the many instructional theories and models that instructional designers can utilize when developing instructional products are Richard Mayer's (1996) SOI Model for Constructivist Learning, Mayer's (2005) Cognitive Theory of Multimedia Learning, John Sweller's (2003) Cognitive Load Theory, and David Jonassen's (1999) Constructivist Learning Environments.

The development domain consists of four sub-domains: print technologies, audiovisual technologies, computer-based technologies, and integrated technologies. These sub-domains mirror chronological changes in technology. Because the development domain uses design, production, and delivery functions, each category may be utilized in the creation of a material.

Print Technologies

"Print technologies are ways to produce or deliver materials, such as books and static visual materials, primarily through mechanical or photographic printing processes" (Seels & Richey, 1994, p. 37). Print technologies are the most basic, including text, graphics, and photographs. An example of a print technology would be text printed out in hard copy form.

Print technologies can be broken down into two sub-categories: verbal text materials and visual materials. These materials rely greatly upon the visual perception, reading, human information processing, and learning theories. Textbooks are the oldest and most common form of a print technology. Programmed instruction is another form of print technologies. An advantage of print technologies is that they are learner-centered. The learners can reorganize and restructure the information. A disadvantage would be that print technologies provide one way, receptive communication. In other words, the learner cannot interact with the material (Seels & Richey, 1994).

Audiovisual Technologies

"Audiovisual technologies are ways to produce or deliver materials by using mechanical or electronic machines to present auditory and visual messages" (Seels & Richey, 1994, p. 38). It is characterized by the use of hardware such as TVs, VCRs, DVD players, film projectors, overhead projectors, and slide projectors to deliver instruction.

Audiovisual technologies have a tendency to be linear in nature and are physical representations of real and abstract ideas. Visuals are presented dynamically which is an advantage. Principals of behavioral and cognitive psychology are used in the development of audiovisual technologies. Furthermore, audiovisual technologies are often teacher-centered and involve a low degree of learner interactivity (Seels & Richey, 1994, pl 39).

Computer-based Technologies

"Computer-based technologies are ways to produce or deliver materials using microprocessor-based resources" (Seels & Richey, 1994, p. 39). Computer-based technologies utilize data in the digital form rather than print or visuals. Behavior theory and programmed instruction are the basis of various computer-based technologies such as computer-based instruction (CBI), computer-assisted instruction (CAI), or computer-managed instruction (CMI) (Seels & Richey, 1994, p.39). There are four CBI applications used to deliver instruction.

Tutorials- Primary instruction is presented

Drill and Practice- Helps learner in developing fluency in recently learned material

Games and Simulations- Provides the learners with opportunities to apply knowledge

Databases- Affords learners to access large data structures

Advantages to computer-based technologies include the fact that they can be used randomly as well as linearly. They also encompass the desires of both the learner and the designer. Additionally, learning can be student centered as well as feature higher learner interactivity.

Integrated Technologies

"Integrated technologies are ways to produce and deliver materials which encompass several forms of media under the control of the computer (Seels & Richey, 1994, p.40). By utilizing various forms of hardware and software in the production and delivery of instruction, a higher degree of learning interactivity will be promoted.

Integrated technology instruction can be used in random as well as linear ways. The materials can become realistic to the learner, according to the relevance they have on the learner. Furthermore, integrated resources promote a higher degree of learning activity.

An on-line course taught using a learning management system (LMS) is an example of integrated technology. Blackboard Vista is an example of a LMS that allows the instructor to conduct learning completely on-line in both synchronous and asynchronous environments using discussions, live chats, streaming media and digitized information.