

## **Domain of Design**

The instructional design domain is the basis on which the field of instructional technology is built. Instructional technologists must follow solid instructional design processes and principles in order for the remainder of their work to be sound and hold integrity.

The domain of instructional design is made up of both the analysis and design phases of instruction. A thorough analysis must be carried out in order to identify the needs to be addressed in the design of the instruction. The analysis phase is crucial for identifying the appropriate instructional goals, the performance objectives, and the delivery system. In this phase, information is gathered via a performance analysis, needs assessment, job analysis, instructional analysis, and learner and context analysis (Dick, Carey & Carey, 2005).

“Design is the process of specifying conditions for learning” (Seels & Richey, 1994, p. 30). The design phase of instruction uses a systems approach to address performance problems which were uncovered in the analysis phase. After the analysis phase is complete, the instructional designer generates strategies and products to fill the gaps he or she discovered in the needs assessment. The design phase of instruction occurs at the micro level with products such as lessons and modules, and also at the macro level with entire programs and curricula.

The domain of instructional design is broken down into four sub-domains: instructional systems design, message design, instructional strategies, and learner characteristics.

## **Instructional Systems Design**

Instructional Systems Design (ISD) is “an organized procedure that includes the steps of analyzing, designing, developing, implementing and evaluating instruction” (Seels & Richey, 1994, p. 31). Likewise, “a system is a group of interrelated parts working together toward a defined goal” (Dick, Carey & Carey, 2005, p. 367). ISD follows both systemic and systematic approaches to the design of instruction. In a systemic framework, all parts of a system are interrelated and if one component in the system changes, all other components of that system will be affected. Within a systematic approach, a step-by-step procedure is outlined which analyzes learners’ needs, designs and develops the instructional materials, and evaluates the effectiveness of the instruction.

The universal ADDIE model serves as the basis for most ISD models. ADDIE stands for Analysis, Design, Development, Implementation, and Evaluation. The Seels and Glasgow (1998) and Dick, Carey, and Carey (2005) models are both based on the ADDIE model which is further described below:

Analysis. Processes are followed in order to examine and break down what is to be learned.

Design. Procedures are carried out in order to prescribe how it is to be learned.

Development. Instructional materials are produced.

Implementation. Instructional materials and instructional strategies are enforced in the context determined in the analyze step.

Evaluation. The appropriateness and acceptability of the instruction is ascertained.

Even though the ISD process may appear to be linear, it is not. Throughout the instructional design process, the instructional designer uses evaluation process to make changes as needed. In addition, the instructional designer remains thorough while carrying out the instructional design procedures in order to maintain consistency while moving from one step to the next step. Because the steps in the ISD process build upon on each other, the instructional designer often uses each step to serve as checks and balances on the others, further ensuring consistency and accuracy throughout the process, and ultimately confidence and integrity in the final product.

In addition to the Seels and Glasgow (1998) and Dick, Carey, and Carey (2005) ISD models, instructional designers follow a number of other models during the ISD process. Among them are Morrison, Ross, and Kemp's Designing Effective Instruction (2007), and Smith and Ragan's Instructional Design Model (2004).

During the analysis phase of the ISD process, instructional designers perform a needs assessment in order to identify the gaps (needs) between what is (actuals) and what should be (optimals) within an organization. The purpose of the needs assessment is to identify the type of problem and the appropriate solution to that problem. Data is gathered during the needs assessment through interviews, observation, and surveys or questionnaires.

The instructional designer also carries out a subject matter analysis and a task analysis. The results of the subject matter analysis show the instructional designer exactly what employees need to know in order to perform their jobs properly, while the results of the task analysis illustrate to the instructional designer how top performers do their jobs so that the instructional designer can have a benchmark for excellence. The subject matter analysis is conducted through interaction with subject matter experts, and the task analysis is carried out primarily through observation.

Following the analysis phase of ISD, the instructional designer enters the design phase. The purpose of design is to determine the performance objectives and to develop the assessment instruments and instructional strategies. These three steps in the design phase take into account the learner, context, and performance analyses. Instructional designers use principles and models to aide them in making key decisions at the design stage of the ISD process. Among them may be Bloom's Taxonomy of Learning or Gagne's Conditions of Learning.

## **Message Design**

Message design concerns “Planning for the manipulation of the physical form of the message” (Grabowski, 1991, p. 206). In short, message design is the form information takes when it is presented to the learner. Messages may be presented in many different forms including images (still or moving), recorded sounds, or static words printed on a page. Before designing the message, the designer must determine how it will be used, as well as which media will deliver it to the learner. The design of the message must pertain to both the media as well as the learning task. This means that whether the message is delivered via computer, film, or print, and whether the task is for concept of attitude formation, memorization, etc., the design must adhere to the appropriate message design principles (Seels & Richey, 1994).

Richard Mayer’s Cognitive Theory of Multimedia Learning is one which instructional designers often turn to when attempting appropriate message design. The assumption of Mayer’s theory is that the human mind works on dual channels, limited capacity, and active processing. Dual channels theory means that humans process incoming information through two separate channels. Limited capacity means that humans can only process so much information within each of the two channels at any given time. And active processing means that humans learn by processing relevant information, organizing it into mental images, and then combining the new mental images with other knowledge they already possess (Mayer, 2001).

So, an instructional designer might apply Mayer’s theory by designing messages which address dual channels of the learner (eyes and ears, perhaps), the learner’s limited capacity (restricting distractions such as sounds or colors), and the learner’s ability for active processing (organizing content into an easy-to-select hierarchy of words and text).

## **Instructional Strategies**

“Instructional strategies are specifications for selecting and sequencing events and activities within a lesson” (Seels & Richey, 1994, p. 31). Similarly, Dick, Carey, and Carey (2005) define instructional strategies as “an overall plan of activities to achieve an instructional goal” (p. 365). For the instructional designer to determine the appropriate instructional strategies, he or she should use the results of the analysis phase of design – the needs assessment along with the task, context, and learner analyses.

The steps in the design domain answer the question of how to systematically design instruction. The process of making decisions about instructional strategies, on the other hand, helps the instructional designer determine how to teach each task or achieve each objective (Dick, Carey, & Carey, 2005). In planning the instructional strategies, the instructional designer chooses a delivery system, decides how to sequence and cluster the content, describes the learning components, determines student groupings, and selects media and delivery systems.

The instructional designers often use different instructional design models and theories such as Hannafin's Open Learning Environments, Gardner's Multiple Intelligences, and Schanks' Learning by Doing. One of the widely used instructional design models is Gagne's Conditions of Learning (1970). This cognitive learning theory proposes nine events for instruction, each of which is representative of activities the learner can engage in to support his or her own cognitive learning. Dick, Carey, and Carey (2005) incorporate Gagne's nine events into their ISD model by paring it down into five parts of the umbrella instructional strategy. Those events are: preinstructional activities, content presentation, learner participation, assessment, and follow-through activities.

### **Learner Characteristics**

“Learner characteristics are those facets of the learner's experiential background that impact the effectiveness of a learning process” (Seels & Richey, 1994, p. 32). The purpose of determining learner characteristics is to account for the aspects and characteristics of the learner before implementing the design phase.

The learner characteristics are gathered for the target audience of the instruction. Information about the target audience that the instructional designer wants to gather includes entry behaviors, prior knowledge, attitudes, motivation, skill levels, and learning preferences (Dick, Carey, & Carey, 2005). The information may be gathered through interviews, observations, pretests, questionnaires, and existing records. There are a wide range purposes for gathering the information since the learner analysis is required for every aspect of the design of instruction. Among them are to help the instructional designer fully understand the learner so as to select the appropriate instructional strategies and delivery mechanisms.