

The Domain of Design

The domain of design is the “process of specifying conditions for learning” (Seels & Richey, 1994, p. 30). Its purpose is to define what and how is to be learned and creates a format from which to present the information. Therefore, the domain of design begins with the critical task of analyzing the problem. If this goal is not probably defined, time and dollars spent designing the instructional materials and conducting training will be wasted as the performance problem is likely to remain. Like any good house, the process needs a strong foundation, and the domain of design is strongly supported by theories which support its practice in instructional design through the use of models. These models serve as guidelines or road maps for the effective design of instruction, and sample models include those created by Dick, Carey & Carey (2005), Morrison, Ross, and Kemp (2007) and Seels and Glasgow (1998), are displayed below.

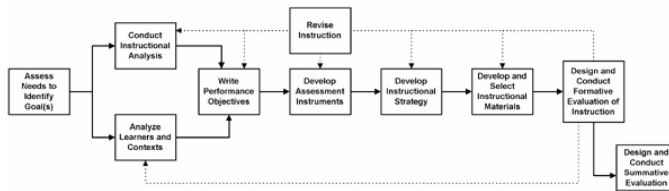


Figure 1: ISD Model: Dick, Carey and Carey (2005)

Adopted from: <http://www.itma.vt.edu/modules/spring03/instrdes/images/dickcarey.gif>

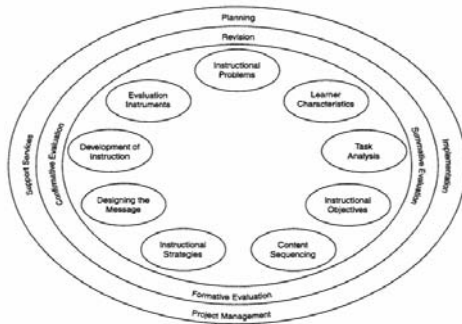


Figure 2: ISD model: Morrison, Ross and Kemp (2007)

Adopted from: <http://www.personal.psu.edu/users/m/r/mrs331/kempmorrisonross.gif>

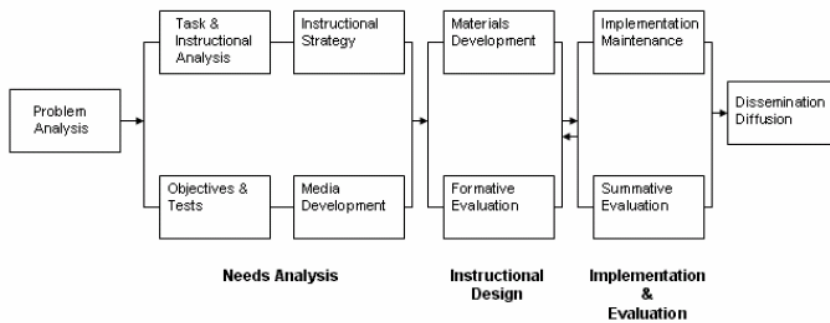


Figure 3: ISD Models: Seels and Glasgow (1998)

Adopted from: [http://herridgegroup.com/pdfs/The use of Traditional ISD for eLearning.pdf](http://herridgegroup.com/pdfs/The%20use%20of%20Traditional%20ISD%20for%20eLearning.pdf)

The domain of design is composed of four primary areas of study: (1) instructional systems design, (2) message design, (3) instructional strategies, and (4) learner characteristics (Seels & Richey, 1994, pp. 30-33).

1. Instructional Systems Design – ISD

Instructional systems design (ISD) refers to the systems approach for designing material, either at the macro level, such as an entire curriculum, or at the micro-level, as in individual lessons. A system is a “set of interrelated parts, all of which work together toward a defined goal” (Dick, Carey & Carey, 2005, p 1). In this case, the system includes all processes involved to create effective instructional materials with the ultimate goal of improving performance. ISD is the process used to create effective instructional materials using the components of design, development, implementation, evaluation and revision with the ultimate goal of improving performance.

As indicated in the AECT 1994 definition, the field of instructional technology emphasizes the application of theories in practice when executing each domain. Instructional models are the translation of learned theories and principles based on practice. Working models serve as a guide to the instructional designer for making decisions.

There are many instructional design models, derived from systems theory, available on the market to serve as a guide to the instructional designer in making decisions, such as those designed by Dick, Carey and Carey (2005), Seels and Glasgow (1998) and Morrison, Kemp and Ross (2007). Although variation exists among the models, most of them contain common features, as shown in the generic ADDIE (Analysis, Design, Development, Implementation and Evaluation) process below.

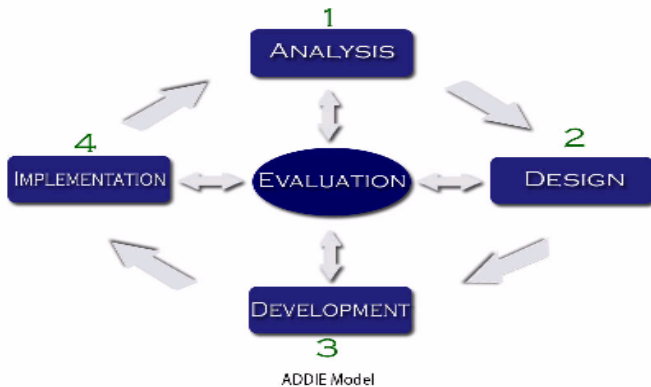


Figure 4: Generic ADDIE process

Adopted from: <http://itsinfo.tamu.edu/consult/howtodesign.htm>

Below is a list of the major tasks involved in each instructional design phase: (Dick, Carey & Carey, 2005):

Analyze:

- Conduct a needs assessment or front-end analysis to identify the problem.
- Perform an instructional analysis to identify skills and knowledge to be included in the instruction
- Conduct learner and content analyses to identify the characteristics of the learners, the context in which the instruction will be delivered and in which the skills will be used.

Design:

- Identify goals and performance objectives to describe what the student will be able to do when they complete the unit of instruction.
- Prepare assessment items to measure whether the objectives have been met.
- Determine instructional strategies to identify the proposed delivery system, sequencing or clustering of content, describing learning components, specifying how students will be grouped during instruction, establishing lesson structures and chosen media for instruction.

Development:

- Examine media delivery options to determine the format to deliver the instruction to best fit the needs of the learners with available resources.
- Draft materials to generate lesson plans, instructional materials and all supporting materials.
- Draft materials to determine the look and feel using selected media.
- Design and conduct formative evaluation to improve the effectiveness of the instruction.
- Revise instruction based on results of the formative evaluation.

Implementation:

- Place the created materials into their real world environment.
 - ⊗ Are the intended instructors familiar with the course content, instructional methods and the delivery media?
 - ⊗ Are resources available and in working order to deliver the instruction as intended?

Evaluation:

- Conduct a formative evaluation to gather information needed to make revisions in the instructional materials.
- Conduct a summative evaluation to determine conclusions regarding the worth of the program or product and make recommendations about its adoption or retention.
- Conduct a confirmative evaluation to determine long term success of change by looking at knowledge and skill retention.

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2. Message Design

Message design requires the instructional designer to plan “for the manipulation of the physical form of the message” (Seels & Richey, 1994, p. 31). It is the interface between the learner and the instructional message. The designer incorporates components of message design in order to determine the ways to present the information to the learner so as to grab their attention, improve the learner’s ability to relate to the material and improve learning and retention.

Many instructional theories exist for designing an effective message (Reigeluth, 1999), such as the Information Processing theory and Richard Mayer’s (1998) Instruction for Constructivist Learning. Mayer’s theory states that learning occurs when the learner “constructs a knowledge representation in working memory” (Reigeluth, 1999). Thus, during the learning process, the learner is required to *construct* or build new knowledge through successful interaction with instructional materials. The teacher is there to provide guidance throughout the learning process. This learning process requires the student to use the cognitive processes listed below and is referred to as the SOI (Selecting, Organize, Integrate) model of learning.

1. **Selecting** relevant information to be retained in visual and auditory working memory.
2. **Organize** the information into images that “make sense”. This results in the construction of a pictorial and verbal mental model in working memory.
3. **Integrating** the pictorial and verbal mental models and making the connections with existing knowledge in long term memory.

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3. Instructional Strategies

Instructional strategies are the approaches the instructor takes to achieve the desired objectives, a variety of teaching and learning activities, which may include “group discussions, independent reading, case studies, lectures, computer simulations, worksheet and so on” (Dick, Carey & Carey, 2005, p. 183). These strategies should be included in the instructional design to motivate the learner from the beginning of the instruction to the end, in order to promote the achievement of the stated objectives. Robert Gagne’s Nine Events of Instruction, published in *Conditions of Learning* (1970), are commonly used by instructional designers in developing instructional strategies to facilitate active and effective learning.

1. Gain attention
2. Inform learners of objectives
3. Stimulate recall of prior learning
4. Present the content
5. Provide learning guidance
6. Eliciting the performance
7. Provide feedback
8. Assessing the performance
9. Enhance retention and transfer

Based on Gagne's nine events of instruction as listed above, Dick, Carey & Carey (2005) developed five components of effective instructional strategy. These five components include: (1) pre-instructional activities to gain attention and motivate, describe objectives and review prerequisite skills, (2) content presentation to define what information, concepts, rules and principles will be presented, (3) learner participation for practice and feedback, (4) assessment items to determine when and exactly what skills will be tested and (5) follow-through activities to review whether "learner memory and transfer needs have been addressed" (Dick, Carey & Carey, 2005).

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4. 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). Prior to designing the instruction, the designer should gather useful information regarding the characteristics of the learner that could potentially impact the instruction or the learner. The characteristics of learners includes: (1) entry behaviors, (2) prior knowledge of the topic area, (3) learner attitudes toward content and the potential delivery system, (4) academic motivation, (5) educational and ability levels, (6) general learning preferences, (7) attitudes toward organization providing the training and (8) group characteristics.

"Many instructors consider the motivational level of learners the most important factor in successful instruction (Dick, Carey & Carey, 2005, p. 101). John Keller's ARCS model (1987) depicts the different types and stages of motivation and suggested strategies to be used for promoting motivation. Teachers and instructional designers should pay careful attention and apply these strategies to achieve successful learning.

Keller's ARCS Model

1. Attention – Process of concentrating on input from the environment
2. Relevance – Desire to satisfy basic motives
3. Confidence – Desire to feel secure and in control
4. Satisfaction – Desire to feel good about oneself