

Running Head: THE FIELD OF INSTRUCTIONAL DESIGN

Instructional Design Basics

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### Abstract

Instructional design has been around for a long time. This paper will explain instructional design and the models used to make training effective. It will also compare the different models to one another. In addition, this paper will give an overview of instructional design philosophies and education implications for each theory. The paper will be concluded with the philosophy and instructional design model that aligns with my personal beliefs as well as an instructional product with an detailed example of how it ties to one of the ID models

## Instructional Design Basics

Many definitions exist to assist individuals in understanding instructional design. With that in mind, “all of them are an expression of underlying philosophies and view points of what is involved in the learning process” (Siemens, 2002). Reiser and Dempsey (2007), states “instructional design (ID) is a systematic process that is employed to develop education and training programs in a consistent and reliable fashion” (p.11). Instructional design is a learner-centered approach to instruction so that learning is effective and meaningful.

When reflecting on the definition of instructional design, I think of how learning takes place with students in the classroom. Teachers begin at the lower levels of Blooms which are knowledge and comprehension to ensure the students development a foundation for learning. Once students have a working understanding of the basic concepts, teachers can build on their foundation and teach at the higher levels of Blooms Taxonomy. Instructional design when viewed as a process is an approach that implies “Instructional Design is the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs. It includes development of instructional materials and activities; and tryout and evaluation of all instruction and learner activities” (Berger, 1996). The purpose of the instructional design process is to identify the outcomes of instruction, guide developing the instructional content (scope and

sequence) and establish how instructional effectiveness will be evaluated.

(Walsh, 1992) As a trainer, individuals must ensure that the instructional design is effective and meaningful.

As an educator in the classroom, my definition of instructional design is a learner centered systematic process that helps learners transfer skills to a real world project or task. My definition of instructional design will continue to development as I learn more about the area of instructional design and advance my career toward training and development. While working in the instructional technology program students must incorporate and understand instructional design which is one of the essential elements in the instructional technology field. “An instructional design model gives structure and meaning to an instructional design problem, enabling the would-be designer to negotiate her design task with a semblance of conscious understanding” (Ryder, 2007). Instructional designers use many theories and models to design instruction. The next section will discuss the Addie model in comparison to several other design models.

#### ADDIE Model

There are several design models that can be used in the instructional design process. “There are more than 100 different ISD models, but almost all are based on the generic "ADDIE" model, which stands for Analysis, Design, Development, Implementation, and Evaluation” (Kruse, 2007). The ADDIE model is traditionally used by instructional designers, training developers and in academic settings.

The ADDIE model is a systematic instructional design process consisting of five phases which include analysis, design, development, implementation, and evaluation (Learning Theories Knowledgebase, 2007). The phases sometimes overlap and can be interrelated; however, they provide a dynamic, flexible guideline for developing effective and efficient instruction (Kemp, 1996). Outputs from each stage in the ADDIE model are the inputs for the next phase of the model. The five phases of the ADDIE model are analysis, design, development, implementation, and evaluation.

The analysis phase is the first stage which is the foundation for all the phases of the ADDIE model. In this phase the goals you want to achieve must be defined, the task the need to be trained, and what resources are needed to successfully carry out the training. “Analysis considers the learning environment, any constraints, the delivery options, and the timeline for the project” (Learning Theories Knowledgebase, 2007). The outputs of this phase often include instructional goals and a list of tasks to be instructed (Kruse, 2007).

The second phase is design which involve using the outputs from the analyze phase to plan a strategy for developing the instruction. An outline must be developed on how to reach instructional goals determined during the analysis phase” (Kruse, 2007). The next phase is the develop phase that builds on the previous stages of the ADDIE model to include analysis and design. “In this phase, a list of activities must be utilized that will help the students learn the task, a delivery method must be selected, existing material are reviewed in order to use time efficiently, development of the instructional courseware, the coursework

needs to be synthesized into a viable training program, and instruction must be validated to ensure it accomplishes all goals and objectives” (Ryder, 2007).

The fourth phase is implementation referring to the actual delivery of instruction. The phase focuses on the effective and efficient delivery of instruction. “It must promote the students' understanding of material, support the students' mastery of objectives, and ensure the students' transfer of knowledge from the instructional setting to the job” (Kruse, 2007). The final phase is evaluation which measures the effectiveness and efficiency of instruction. This phase consists of formative and summative evaluation where revisions are made as necessary (Learning Theories Knowledgebase, 2007).

The ADDIE instructional design model is very useful because it is a basic model that can be used for any type of learning. “The model is simple and includes all the components found in all other instructional design models” (Walter, 1996). However, the ADDIE model has been criticized as being “too systematic, that is, too linear, too inflexible, too constraining, and even too time-consuming to implement” (Kruse, 2007). With that said, there are other instructional design models that can be implemented to meet training and educational program needs.

#### Other Instructional Design Models

The Dick and Carey’s System approach is an instructional design model that prescribes a methodology for designing instruction based breaking instruction down into smaller components and used to teach knowledge and skills. “Instruction is specifically targeted on the skills and knowledge to be taught

and supplies the appropriate conditions for the learning of these outcomes” (Kemp, 1996). The Dick and Carey’s System approach model compares to the ADDIE model with its phases used to development instructional materials for training. The phases include: identify instructional goals, conduct instructional analysis, identify entry behaviors and characteristics, write performance objectives, develop criterion referenced test items, develop instructional strategy, develop and select instructional materials, design and conduct formative evaluation and design and conduct summative evaluation (Broderick, 2001).

Both models involve identifying the instructional problem, determining the needs of the learners, identifying topics of instruction, and considering the context of instruction (Bernadette & Stamm, 2002). The design phase in both models encompasses the writing of performance objectives and the creation of assessment methods. In addition, the organization and sequence of instruction as well as the identification of course materials are addressed in the development phase. Delivery of instruction and evaluation of its effectiveness serve as implementation and evaluation in both models as well (Bernadette & Stamm, 2002). The instructional implications for Dick and Carey are that “learning is based on mastering a set of behaviors which are predictable and therefore reliable” (Kemp, 1996). The appropriate instructional analysis will lead to demonstrable skills by the learner. According to Bernadette & Stamm (2001), the Dick & Carey model offers an distinct advantage over the ADDIE model because it provides guidance through the design phase of instruction, which is represented in steps 6, develop instructional strategy, and through step 8, design

and conduct formative evaluation of instruction. However, with every ID model there are advantages and disadvantages. The criticisms of the Dick and Carey model are that some feel the model represents a fairy-tale that describes how instruction could be developed if we had unlimited time, knowledge, and resources. It was also stated that the “is somewhat arrogant in its assumption that we can predict with accuracy at the beginning of a development process what will work and what will not work” (Andrews, 1980, p.6)

Gagne’s instructional design (ID) theory “is considered a seminal model that has influenced many other design approaches and particularly the Dick & Carey systems approach. Gagné proposed that events of learning and categories of learning outcomes together provide a framework for an account of learning conditions” (Kruse, 2007). Gagne’s Nine Events provides an instructional model that also compare to the ADDIE model in that it can effectively organize almost any lesson plan. Gagne’s ID theory and the ADDIE model overlap in several areas. Both models include several tasks that mirror each other. They include need analysis, defining objectives, materials to facilitate learning, implementation, and evaluation. In the needs analysis both models ask what is the problem and how do we solve the problem. In addition, defining the objectives in the design phase of the ADDIE model compares to Gagnes second event, informing learners of instruction. Although there are several other areas to compare in each model, I feel that evaluation is very important. Gagne’s eighth event assessing the performance of the learner

mirrors ADDIE's E for evaluation which determines the effectiveness of instruction.

Robert Mager's criterion referenced instruction (CRI) is a comprehensive set of methods for the design and delivery of training programs. According to Moore (2006), "training programs developed in CRI format tend to be self-paced courses involving a variety of different media (e.g., workbooks, videotapes, small group discussions, computer-based instruction)." Students pace their learning and take tests to determine if they have mastered a module. CRI is based upon the ideas of mastery learning and performance-oriented instruction (Ryder, 2007). CRI incorporates Gagne's ID model and the ADDIE model. Many of Gagne's ideas such as task hierarchies, and objectives are found in the CRI because of its emphasis on learner initiative and self-management (Ryder, 2007). In addition, the CRI methodology also follows the ADDIE model. The table below shows how the CRI compares with ADDIE

<b>ADDIE</b>	<b>CRI</b>
Analyze	-Describe Learning Environment -Describe Relevant Practice
Design	-Draft Module Practice -Derive Content/Activities -Derive Delivery System
Develop	-Draft Module -Try Out Module
Implement	-Prepare Modules -Prepare Implementation Instructions
Evaluate	-Revise Module

The CRI methodology forces a paradigm shift in which the learner is forced to take responsibility for their own learning (Moore, 2006).

## Comparison of Philosophies

Learning theories address how individuals learn. “Instructional technology led to the development of instructional systems design (ISD), which evolved into the standard for engineering effective learning” (Reiser & Dempsey 2007, p. 139). Driscoll (2005) defines learning as “a persistent change in human performance or performance potential” (p.9). To gain a deeper understanding of the instructional design models, we must understand the three philosophies behaviorism, cognitivism, and constructivism.

Behaviorism, “assumes the learner is essentially passive, responding to environmental stimuli. The learner starts off as a clean slate (i.e. *tabula rasa*) and behavior is shaped through positive reinforcement or negative reinforcement” (Learning Theories Knowledgebase, 2007). Experiments by behaviorists identify conditioning, classic and behavioral, as a universal learning process. Classic conditioning occurs when a natural reflex responds to a stimulus while behavioral conditioning occurs when a response to a stimulus is reinforced. In education, a classroom teacher may use behaviorism to reward or punish student behavior.

Cognitivism “focuses on the inner mental activities – opening the “black box” of the human mind is valuable and necessary for understanding how people learn” (Learning Theories Knowledgebase, 2007). Thinking, memory, knowing, and problem-solving are mental processes that need to be explored. Roblyer (2006) states “learning is a building process; learners must have prerequisite skills for each new skill (p.41). In education, a classroom teacher may use cognitivism by providing instructional activities where students have to

demonstrate that they have learned the basic skills to advance to higher level thinking skills.

Constructivism focuses on learning as an active and constructive process. “New information is linked to prior knowledge, thus mental representations are subjective” (Learning Theories Knowledgebase, 2007). Learning occurs when one constructs both mechanisms for learning and the individuals’ version of the knowledge, colored by background, experiences and aptitudes (Roblyer, 2006). In the classroom, instruction is teacher-centered and students work with hands on activities to show what they have learned.

### Personal Philosophy

As I reflect on the instructional design models and philosophies, as a classroom teacher and future trainer I feel like constructivism philosophy and the ADDIE instructional design model aligns with my personal beliefs. I believe students should complete hands on activities and projects in the classroom that help them generate their own knowledge which aligns with the constructivist view (Roblyer, 2006). There are several ways to effectively assess students’ knowledge other than through written test. Through researching several instructional design models, I found different parts of each model that aligned with my personal philosophy. However as a classroom teacher with a constructivist philosophy, I feel the ADDIE ID model will allow me to create a learner centered environment versus the old traditional teacher centered environment (Kemp, 1996). The ADDIE model is set up where each step has an

outcome that feeds into the next step in the sequence (Learning Theories Knowledgebase 2007).

### Instructional Product & ID Model

In closing, to keep learners engaged in a lesson while teaching a new concept, I would create a how-to video as an instructional product. The model that I would implement would be Gagne's ID model. Robert Gagne is best known for his Nine Events of Instruction. Gagne "believes that effective instruction should reach beyond traditional learning theories. He supports cumulative teaching that transitions from simple to complex skills" (Killpatrick, 2001, section 1). The example presented below will give my instructional product and how it aligns with Gagne's ID model:

In a high school multimedia class, the product would be an instructional video that would demonstrate to students how to spice up their PowerPoint presentations by making them interactive. The first event in Gagne's ID model is to gain the learners' attention. The instructional video would draw the learner and engage them in the activity. It then would state the objectives (event 2: Inform Learner of Objective) and help them recall what they have already learned about PowerPoint (event 3: Recall Prior Knowledge). The video would then present the material and guide them through the steps for adding the interactive function to their PowerPoint presentations (event 4: Present Material & event 5: Provide Guided Learning). The sixth event, which is to elicit performance, would transform when the students actually apply what they have learned. As

students are working, I would walk around and assess their performance giving feedback (event 6: Elicit Performance & event 7: Provide Feedback). I would then assess performance (event 8) and have them create an interactive project on a concept in the one of their core classes to enhance retention and transfer which is step nine.

Gagne's Nine Events can effectively organize almost any lesson plan (Kruse, 2007). Educational Implications for Gagne is that instruction must be structured and students' knowledge will build knowledge through a hierarchy (Roblyer, 2006).

### Conclusion

As technology and instructional design continue to advance, there will be more improved and innovative techniques that will allow the field of instructional technology and design flourish. As educators and trainers we must remain abreast with the current and changing trends and issues in instructional technology and design. I look forward to learning more about the field of instructional technology as well as applying what I have learned to my future career in training and staff development.

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