Domain of Design

Seels and Richey (1994) define design as "the process of specifying specific conditions for learning" (p. 30). I have concluded that design is the primary concern of any instructional technology process because the success of the final product is dependent upon careful planning and design. In addition, I think, practitioners across all domains of instructional technology must at some point employ design principles in designing analysis tools, using design specifications to develop materials, designing ways to increase utilization, and designing evaluation tools.

Seels and Glasgow (1998) assert that design focuses not only on what will be taught but how it will be taught based on the objectives for the learning, strategies for learning, and the way the learning will be presented are all decided upon based on the needs of the learners. Without this careful planning in the design stage, I think an instructional designer would be unable to create effective instruction to meet instructional goals because design is important across all domains apart from independent applications. In my experience I have also found that development is defined by the design while utilization, management, and evaluation all require careful planning and design for effective practice.

Within the design domain, Seels and Richey (1994) identify four sub-domains of theory and practice (p. 29). These sub-domains are:

- Instructional Systems Design (ISD)
- Message Design
- Instructional Strategies
- Learner Characteristics

Instructional Systems Design (ISD)

Instructional Systems Design (ISD) involves working at both the macro and micro levels to design instruction. Macro-level design such as creating programs and curricula as well as micro-level design involved in creating product such as lessons or individual modules both require careful design considerations. Both levels of design, although different in scope, require the same general process of analysis, design, development, implementation, and evaluation according to Seels and Richey (1994). These five steps form the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model for design as shown in Figure 5.

Each phase of the ADDIE model serves a purpose within the ISD process. Instructional Systems Design is intended to help the designer make decisions about content, instructional strategies, assessment, and the media that will be used in presenting the instruction (Seels & Glasgow, 1998). The definition of

each phase and the task involved in conducting each phase are vital to developing a product regardless of the scope. Each phase and its tasks are outlined in Table 1.

While the ADDIE model defines stages for Instructional Design, I find that it does so in a very general method. Therefore, more specific models have been developed that help instructional designers to outline the individual steps to take in designing an instructional product. One such model is the Dick and Carey Systems Approach Model for Designing Instruction (2005) shown in Figure 6. This model provides a systematic process in which the components of the ADDIE model are broken down into smaller task groups.

The Dick and Carey model is a systems model that involves not only a linear progression through the steps as output of one step creates an input for the next step; but the model also encourages a cyclical approach through the evaluation and revision of the process at all stages to ensure that the design is meeting the goals identified in the first step of the model (Dick, 1996). I use the Dick and Carey model often in my design and development projects because it provides such a thorough outline of the ISD process and allows me to replicate the process at its most basic levels while modifying the process as needed for projects with different needs. In addition, I find that the products of this process are valuable in instructional settings because they are based in careful analysis efforts and have been revised based on formative evaluation in addition to being soundly designed.

Message Design

According to Seels and Richey (1994) message design involves planning the ways in which the instruction will be communicated with the learners. This planned "manipulation of the physical forms of the message" involves careful analysis of the learners in order to effectively choose appropriate avenues through which to deliver the message (Seels & Richey, 1994, p. 31).

In addition, the Association for Educational Communications and Technology (AECT) further describes message design as embedded within learning theories (cognitive, psychomotor, behavioral, perceptual, affective, constructivist) in the application of known principles of attention, perception, and retention which are intended to communicate with the learner.

Instructional Strategies

The domain of design also includes instructional strategies which are used by the designer to decide how the material will be presented most effectively to the learners (Dick, Carey, & Carey, 2005). Instructional strategies are the "specifications for selecting and sequencing events and activities within a lesson"

(Seels & Richey, 1994, p. 31). When instructional strategies are applied in practice, they are defined by instructional models.

Dick, Carey, and Carey (2005) attribute the origin of the instructional strategy to Robert Gagne's (1985) nine events of instruction:

1. Gaining attention
2. Informing the learner of the objective
3. Stimulating recall of prerequisite learning
4. Presenting the stimulus material
5. Providing learning guidance
6. Eliciting the performance
7. Providing feedback about performance correctness
8. Assessing the performance
9. Enhancing retention and transfer

Dick, Carey, and Carey (2005) organize these nine events into five components of an instructional strategy:

1. Pre-instructional activities
2. Content presentation
3. Learner participation
4. Assessment
5. Follow-through activities

I benefit from using the Dick, Carey, and Carey components in designing my instruction because they provide a framework regarding the stage of the instructional process at which the nine events of instruction will be applied.

According to Dick, Carey, and Carey (2005) the five components each have their own individual purpose for the learner. Preinstructional activities are meant to motivate the learners, inform them of the objective, and inform learners of prerequisite skills. Content presentation is the stage in which content and examples are provided to the learner. Learner participation encourages practice and provides feedback. Assessment includes an entry behavior test, pretest, and posttest. Finally, follow-through activities facilitate transfer of information through memory aids.

In his book, *Instructional-Design Theories and Models: A New Paradigm of Instructional Theory* (Reigeluth, 1999), Charles Reigeluth describes different theories and models which can aid the designer in selecting appropriate instructional strategies. Models exist to meet a variety of learning needs. One model I find helpful in designing instruction is David Jonassen's Model for Designing Constructivist Learning Environments is focused on "problem solving and conceptual development" (p. 216). This model presents a problem or question as the focus of the learning and provides resources such as related cases, information, cognitive tools, collaboration tools, and social support to aid learners in solving the problem. Instructor support is provided through coaching

modeling, and scaffolding. (Reigeluth, 1999, p. 218) This model focuses on designing an environment for learning and all material and instruction occurs within the environment. I believe that the nature of this model addresses the need for relevance and authenticity in instruction because learners are immersed in the instructional environment.

Learner Characteristics

In every stage of design, I believe it is important to remember for whom the instruction is being created and what those learners need in order to be successful. "Learner characteristics are those facets of the learner's experiential background that impact the effectiveness of a learning process" (Seels & Richey, 1994, p.32).

Learner characteristics can include entry behaviors, prior knowledge of the topic area, attitudes towards content, attitudes toward potential delivery systems, motivation for instruction, educational and ability level, general learning preference, general group characteristics, and attitudes toward the training organization (Dick, Carey, & Carey, 2005, p.197). In my experience, the most vital information about learners concerns entry behaviors and prior knowledge about the content because not only will these factors significantly influence the content and presentation of the instruction but these factors can also be used to deduce other characteristics of learners if that information is not readily available. Knowledge of potential learners' entry behaviors and prior knowledge will influence what content will need to be presented to learners as well as what levels of activities can be used initially in the learning process. I also think knowing what the most basic content needs is for the learner allows content to be organized into an effective instructional design. Attitudes about content, delivery systems, and organizations will also affect the way learners respond to the material and an understanding of the educational and ability levels of the learners will aid the designer in planning appropriate levels of materials for the potential learners as well.

Most importantly, knowledge of learner characteristics overlaps with other areas of design. For example, analysis of learner motivation heavily impacts the decisions made about instructional strategies (Seels& Richey, 1994). One model I have used for understanding learner motivation is John Keller's ARCS Model for motivation (1987). I find this model helpful in understanding my potential learner population because it clearly defines the areas most important to motivation and provides a reference tool for evaluating my decisions in terms of learner motivation.

The ARCS model, shown in Figure 7, addresses learners' attention, relevance of material to the learner, learner confidence, and learners' satisfaction with the learning and how these factors impact the learners' motivation. In order for

instruction to motivate students, careful planning based on these factors must occur throughout design of the instruction (Dick, Carey, & Carey, 2005, p.190). Making considerations in instruction based on these factors allows me to design more effective instruction because the content and presentation are motivating to learners.

Conclusion

Design involves planning the instruction, deciding how instruction will be communicated to the learner, and designing instructional activities and events that will meet the needs of the learners based on the learner characteristics. I believe this domain lays the foundation for the other domains of instructional technology and allows for effective development, utilization, management, and evaluation within an instructional project or process. I think that all domains are affected by design at multiple levels and the successful completion of a project depends on effective and thorough design.