



2.4.8 Methodology for Course Design

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Faculty Development Series

This module addresses the sequential steps of quality course design. Program design includes the identification of long-term behaviors that are reflected in learning outcomes in the course design. The course learning outcomes in turn determine the content, methodologies, and activities of the course and are assessed with measures that can be compared to performance criteria. While the design of specific learning activities is addressed in activity design, course design involves the sequencing of the learning activities within the course to support student learning and enable a course assessment and evaluation structure.

Systematic Design of Instruction and Instructional Design for Process Education

Virtually all models of instructional design follow the ADDIE model (analysis, design, development, improvement, and evaluation) (Kruse & Keil, 2000; Reiser, 2001).

Consistent with the instructional design model, the Methodology for Course Design (Table 1) presents the steps taken for an effective course design process. A discussion of the sections and subsequent steps of the methodology follows.

Analysis: Learning-Outcome Driven Instructional Design

The analysis stage of the instructional design process addresses what the learner is to learn. The results of this analysis should drive the rest of the instructional design (Dick, Carey & Carey, 2004). All content, methodologies, activities, sequencing, and assessment of the learning experience should be traceable to the results of the analysis. The analysis must consider what the learner should be expected to know at the outset of the course as well as what the learner will need to know and be able to perform in the future (Gagné, Briggs, Wager, Golas, & Keller, 2005). For courses, this means that to avoid either duplication or gaps in knowledge or application, the analysis must address what is covered in previous courses and what will be addressed in future courses. A course analysis must also examine how the course fits within the context of the larger program. The behaviors, objectives, and learning outcomes of the course should mesh with the behaviors, objectives, and learning outcomes of the program. Steps 1 through 4 are included in the analysis stage.

Step 1—Construct long-term behaviors.

The long-term behaviors that result from one's participation in a program are the behaviors that a graduate should practice throughout his or her life and professional career; they include working knowledge, performance skills, and attitudes. The long-term behaviors that result from of a course should reflect selected long-term behaviors of the program.

Table 1 Methodology for Course Design

Analysis: Learning-Outcome Driven Instructional Design

- Step 1—Construct long-term behaviors.
- Step 2—Identify course intentions.
- Step 3—Construct measurable learning outcomes.
- Step 4—Construct a knowledge table.

Design: Activities and Knowledge to Support Learning Outcomes

- Step 5—Choose themes.
- Step 6—Create the appropriate methodologies.
- Step 7—Identify a set of activities.
- Step 8—Identify a set of specific learning skills for the course.

Development: Construction and Selection

- Step 9—Identify activity preference types.
- Step 10—Match the activity types with the chosen activities.
- Step 11—Choose the in-class and out-of-class activities.
- Step 12—Allocate time across the themes.
- Step 13—Sequence the activities across the term.
- Step 14—Create individual activities from a prioritized list.
- Step 15—Enhance activities by using technology.
- Step 16—Ask peers to review the activities you create.
- Step 17—Produce key performance criteria.
- Step 18—Locate or build key performance measures.
- Step 19—Design a course assessment system.
- Step 20—Design a course evaluation system.
- Step 21—Design a course syllabus.

Implementation: Facilitating Learning

Evaluation and Assessment: Instruction that Learns From Itself

Step 2—Identify course intentions.

Course intentions describe the intended results of the class. These can take the form of key learning objectives that identify the essential content of the course, including significant learning processes and skills. Other examples of course intentions that are not direct learning objectives for the learners include goals or objectives such as increased student retention and success.

Step 3—Construct measurable learning outcomes.

Learning outcomes connect course intentions and long-term behaviors. The learning outcomes describe what knowledge the student should possess at the conclusion of the program or course. Measurable learning outcomes are critical for the development of assessment and evaluation systems and should address the application of the knowledge as well as retention of the knowledge itself. Since the observation of long-term behaviors will generally be beyond the scope of a class, these learning outcomes are the indicators that long-term behaviors are being developed.

Step 4—Construct a knowledge table.

Once the course learning outcomes have been constructed, a knowledge table should be created for the course. The knowledge table describes the concepts, processes, tools, contexts, and “ways of being” that the student must master in order to achieve the course learning outcomes (2.3.9 *Forms of Knowledge and Knowledge Tables*).

Design: Activities and Knowledge to Support Learning Outcomes

Once the learning outcomes have been determined through analysis, the design process develops a plan for how the learner will achieve these learning outcomes. The design stage is a creative and generative process in which one envisions what the instruction will look like. Steps 5-8 are included in the design stage.

Step 5—Choose themes.

The themes for a course should focus on specific processes, tools, or ways of being to support the development of the long-term behaviors. The themes provide a continuous infrastructure through the course connecting multiple course activities and course learning outcomes to help improve performance in these areas.

Step 6—Create the appropriate methodologies.

Each key process that is to be included in a course should have a corresponding methodology that is identified or developed. A methodology explicitly models those practices that are essential for a novice to learn, and shows how the process is practiced by experts.

Step 7—Identify a set of activities.

Activities include both what happens in the classroom and what the student does outside of class. Each of the items in the knowledge table must be supported by a learning activity appropriate for the type and level of knowledge of that item. At this step, the goal is to generate as many potential activities as possible without fully developing the specifics of those activities.

Step 8—Identify a set of specific learning skills for the course.

In addition to providing content, the course should also incorporate learning skills on which to focus during the course. Learning skills come from four domains: cognitive, social, affective, and psychomotor. While these skills support the learning outcomes of the course, they are also transferable to other courses and environments.

Development: Construction and Selection

The design and development phases are tightly intertwined, highly iterative, and often indistinguishable. At a certain stage in an instructional design project, the activities of the designers will shift away from brainstorming and generating possibilities to making selections and constructing materials and activities. Steps 9-21 are included in the instructional design stage.

Step 9—Identify activity preference types.

To assist in selecting what activity types should be incorporated into the course design, one should review both student and instructor preferences for different types of activities.

Step 10—Match the activity types with the chosen activities.

Collect all possible activities that were identified earlier and organize them by the type. No single type of activity should account for more than twenty-five percent of the activities in an individual course, and one should try to use at least ten different activity types.

Step 11—Choose the in-class and out-of-class activities.

Items on the knowledge table that students have had success with in the past can be addressed outside of class. In-class activities should emphasize activities that are the most critical and challenging for the student and also those steps in the learning process that students have the hardest time learning. When possible, courses should be flexible enough to allow for adjustments in time allocation.

Step 12—Allocate time across the themes.

The time for each theme needs to be allocated both inside and outside of class activities. A percentage of total student learning time should be allocated for each theme.

Step 13—Sequence the activities across the term.

The sequence of activities should provide a progression across the course learning outcomes and the prerequisite knowledge needed to achieve those learning outcomes. In addition, the sequencing needs to provide variety in the activities for students.

Step 14—Create individual activities from a priority list.

The activities that have been selected need to be developed and documented. At a minimum, the documentation must justify the reason for the inclusion of the activity in the course as well as the components of the knowledge map and themes that it addresses.

Step 15—Enhance activities by using technology.

Activities should be reviewed for opportunities to enhance them with instructional technologies (Kruse & Kiel, 2000).

Step 16—Ask peers to review the activities you create.

Peer review of activities increases the quality of the activity design. Student review is also an opportunity to get feedback on the activity.

Step 17—Produce key performance criteria.

One should establish comprehensive, integrative performance criteria for the set of learning objectives and outcomes. The performance criteria describe the expectations for student performance at the end of the course and are used in the design of assessment and evaluation systems.

Step 18—Locate or build key performance measures.

For each of the key performance criteria, identify or create instrument(s) to measure different levels of performance for assessment and evaluation. The performance measures should also be used to assess student performance of the learning skills.

Step 19—Design a course assessment system.

The course assessment system provides a mechanism for both the student and faculty member to track student performance in the course and identify opportunities for performance improvement. The assessment system should relate to the performance measures, and address how students can improve their performance. This step focuses on the design of the student assessment embedded within the class rather than the assessment/evaluation of the class itself, which is a separate stage of instructional design.

Step 20—Design a course evaluation system.

The course evaluation is based on the performance measures and criteria. However, unlike the course assessment system, the evaluation system measures the student's performance relative to standard benchmarks and results in a grade. This step focuses on the design of the student evaluation embedded within the class rather than the assessment/evaluation of the class itself, which is a later stage of instructional design.

Step 21—Design a course syllabus.

The course syllabus should capture the results of the other steps of the design process and clearly communicate the course design and expectations to the student.

Implementation: Facilitating Learning

During the implementation stage, one takes the materials and activities created during the design and development stages and puts them into practice with learners. Implementation is the delivery stage of instructional design. It is the end-result of the instructional design process and is combined with the teaching and facilitation practices of the instructor. Chapter 3.2, **Facilitating Learning**, contains more information related to this stage.

Evaluation and Assessment: Instruction that Learns from Itself

Traditionally in instructional design, the evaluation component involves a summative evaluation that reviews whether the goals determined during the analysis stage were achieved during instruction (Reiser, 2001). A more effective way to approach this phase is to shift from an evaluation model to an assessment model that reviews what aspects of the instruction worked, what aspects did not work, and asks how the instruction might be improved. Ultimately, effective assessment leads to instruction that learns, improves, and adjusts from itself. The assessment process provides a feedback loop to improve the previous stages of the process (analysis, design, development, and implementation) for continuous improvement of the instructional design. For additional information on course assessment, see Chapters 1.5, **Added Value through Program Assessment** and 4.1, **Assessment as a Foundation for Growth**.

Assessment or evaluation of learner performance and activities at this stage of instructional design are not the same as the assessment or evaluation of learner performance within the class. Evaluation and assessment of the class should examine whether or not learners achieved the established learning outcomes. In addition, other aspects of the entire class should be looked at for opportunities to increase the effectiveness and quality of the learning experience. This stage should provide feedback into any and all of the previous steps with guidance on how to continuously improve the instructional design.

Concluding Thoughts

The instructional design process has significant differences at three levels: program design, course design, and activity design. At the heart of all three are learning outcomes and the means to help students to achieve these outcomes, assessment of processes, and evaluation of achievement. Courses include multiple activities to address a set of learning outcomes; these are derived from the long-term behaviors determined in the program design process. Learning activities (or learning objects) are the smallest unit of instructional design and target singular learning outcomes.

The instructional design process uses a structured approach that begins with an analysis to determine the course learning outcomes. This is followed by a process of design and development of instructional activities to enable students to achieve those learning outcomes. The output of instructional design is learning on purpose rather than learning by accident or chance. Without a clear

road map for how learning is to occur, the learning event cannot be repeated, nor can it be reviewed and assessed for continuous improvement.

References

- Dick, W. O., Carey, L., & Carey, J. O. (2004). *The systematic design of instruction*. Boston: Allyn & Bacon.
- Gagné, R. M., Briggs, L. J., Wager, W. W., Golas, K. C., & Keller, J. M. (2004). *Principles of instructional design*. Belmont, CA: Wadsworth.
- Kruse, K., & Keil, J. (2000). *Technology-based training: The art and science of design, development, and delivery*. San Francisco: Jossey-Bass.
- Reiser, R. (2001). A history of instructional design and technology: Part 2: A history of instructional design. *Educational Technology Research and Development*, 49 (2), 57-67.