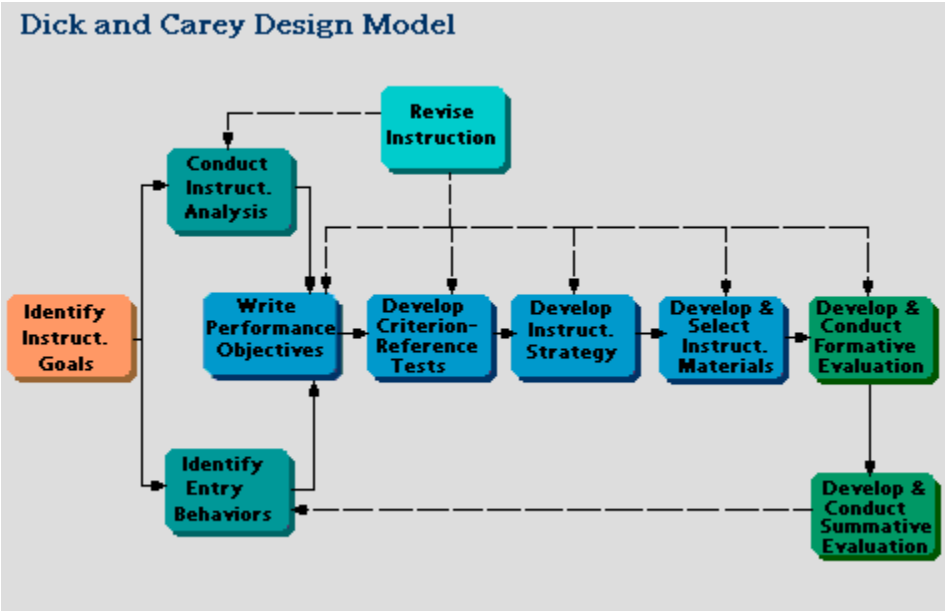
Contact:

Novita Training
1-773-590-3636
info@novitaunique.com
www.novitatraining.com

Systems Approach Model for Designing Instruction (Dick & Carey)

Brief description

The Dick and Carey model prescribes a methodology for designing instruction based on a reductionist model of breaking instruction down into smaller components. Instruction is specifically targeted on the skills and knowledge to be taught and supplies the appropriate conditions for the learning of these outcomes.



Step 1 Identify Instructional Goal

Determine what you want your audience to be able to do after they have completed the instruction. The instructional goal is typically derived from:

- List of goals

- Conducting a needs assessment to determine performance gaps
- Observing difficulties your audience is encountering relating to the instructional topic
- Analysis conducted from someone who is already doing the job

Step 2 Conduct Instructional Analysis

Determine what your audience is required to learn in order to meet your instructional goal.

- Identify subordinate skills that must be learned
- Identify subordinate procedural steps that must be followed

This process typically results in a chart or diagram that depicts these skills and procedural steps and the relationship between them.

Step 3 Identify Entry Behaviors and Characteristics

- Identify specific skills your learners must be able to do in order to begin the instruction
- Identify any specific characteristics of the learners that may be important to consider in the design of the instructional activities

Step 4 Write Performance Objectives

Based on the instructional analysis and the statement of entry behaviors, write specific statements of what the learners will be able to do when they complete the instruction. These objectives should:

- Identify the skills to be learned
- The conditions under which the skills must be performed
- The criteria for successful performance

It is important for performance objectives to state observable behaviors rather than using vague terms like know, understand, and appreciate. Following is a short list of verbs that can be used in stating observable behaviors for performance objectives:

- Analyze, apply, arrange, categorize, choose, compare, complete, compute, define, demonstrate, describe, distinguish, generate, identify, indicate, modify, produce, revise, specify, verify, and write

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Step 8 Design and Conduct Formative Evaluation

Once a prototype of the instructional materials is created, they should be piloted with a group of learners to collect data in order to identify how the instruction can be improved. Various methods can be used to pilot the instructional materials, including one-to-one and small group.

Step 9 Revise Instruction (if needed, based on results of Formative Evaluation)

The emphasis of the formative evaluation is to identify difficulties experienced by the learners in achieving the performance objectives. This data can be summarized and interpreted to determine where the deficiencies in the instruction exist. This data should not only be used to revise the instruction appropriately, but also to determine if the instructional analysis and assumptions regarding the entry behaviors and characteristics are accurate. It may also be necessary to revise the performance objectives and test items.

Step 10 Design and Conduct Summative Evaluation

Once the instructional materials are delivered, a summative evaluation is conducted to determine the value and worth of the instruction. An independent evaluator typically conducts this evaluation.

Key terms

needs assessment: the formal process of identifying discrepancies between current outcomes and desired outcomes for an organization
performance objectives: a statement of what the learners will be expected to do when they have completed a specified course of instruction, stated in terms of observable performances (see also Mager)

sub-ordinate objectives: an objective that must be attained in order to accomplish a terminal objective

terminal objective: an objective the learner will be expected to accomplish when they have completed a course of instruction

instructional analysis: the procedures applied to an instructional goal in order to identify the relevant skills and their subordinate skills and information required for a student to achieve the goal

instructional strategy: an overall plan of activities to achieve an instructional goal; includes the sequence of intermediate objectives and the learning activities leading to the instructional goal

hierarchical analysis: technique used with goals in the intellectual skills domain to identify the critical subordinate skills needed to achieve the goal, and their inter-relationships

formative evaluation: evaluation designed to collect data and information that is used to improve a program or produce; conducted while the program is still being developed

summative evaluation: evaluation designed and used after an instructional program has been implemented and formative evaluation completed; purpose is to present conclusions about the worth of the program and make recommendations about its adoption or retention

References

Dick, W., Carey, L. and Carey, J.O. (2001). The Systematic Design of Instruction. (5th Edition). Addison-Wesley Educational Publishers, Inc.

Instructional design models. (2002) Online. Availabe: http://carbon.cudenver.edu/~mryder/itc_data/idmodels.html

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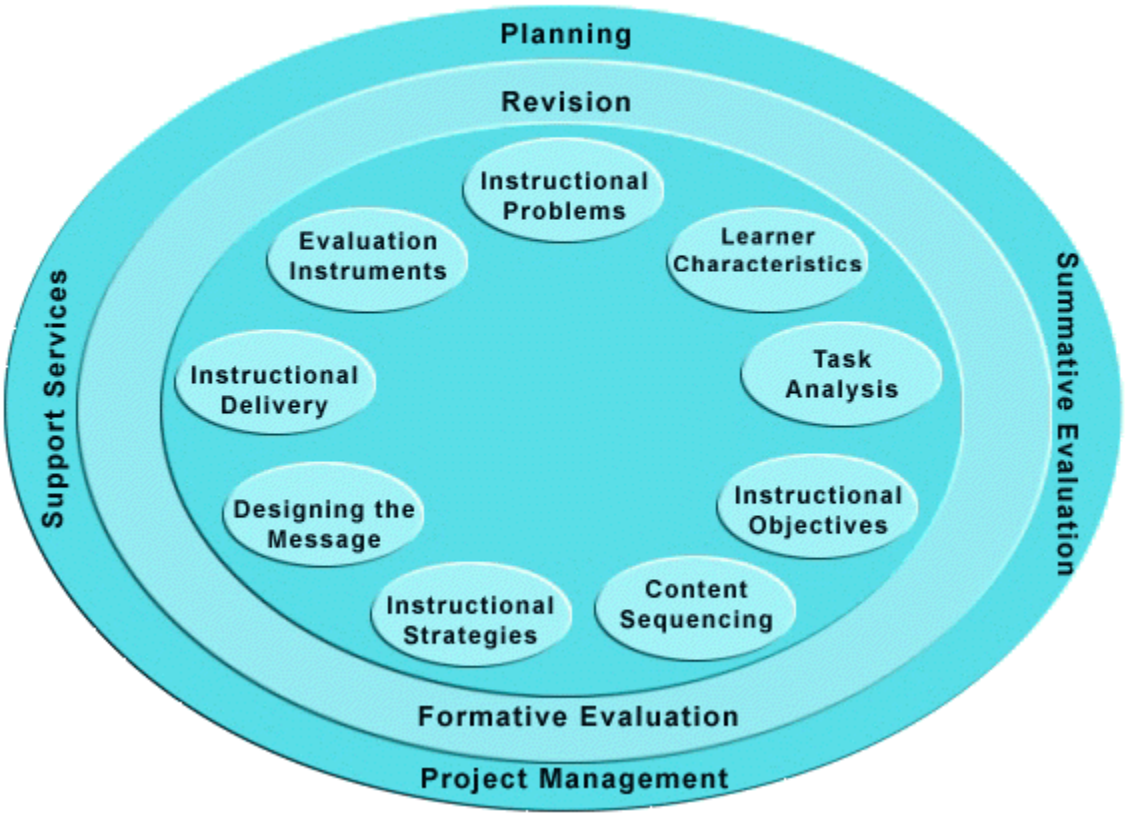
http://www.coe.unco.edu/LindaLohr/home/702/DC.htm

Morrison, Ross and Kemp Model



1. Identify instructional problems, and specify goals for designing an instructional program.
2. Examine learner characteristics that should receive attention during planning.
3. Identify subject content, and analyze task components related to stated goals and purposes.
4. State instructional objectives for the learner.
5. Sequence content within each instructional unit for logical learning.
6. Design instructional strategies so that each learner can master the objectives.
7. Plan the instructional message and delivery.
8. Develop evaluation instruments to assess objectives.
9. Select resources to support instruction and learning activities.

Morrison, Ross and Kemp Model

What is less obvious are the two ovals which surround these basic procedures and the significance of them. The two ovals are meant to suggest that the activities each represents are a 'surround' for the whole project and that they are ongoing throughout it. In the first oval the revision/formative evaluation activities are meant to be undertaken at each stage of the development process, and, if undertaken conscientiously, can assist in making the learning materials very effective by the end of the project. However, in the real world this ideal process is often tempered by the twin realities of time and money. Often designers working to deadlines on tight budgets are not able to undertake the number of tests and revision cycles which they might like to, and consequently, not all materials which are developed using a basic ID process have undergone the improvements which are implied in the models.

The second oval deals with a number of aspects of the design process which instructional designers ignore at their peril. These include planning activities, project management, arranging the necessary services to support both the project and the instruction once it is implemented, and any summative evaluation which is required.

References

Gustafson, K., & Branch, R. M. (1997). Instructional design models. Syracuse, NY: ERIC Clearinhouse on Information and Technology.

Wedman, J., & Tessmer, M. (1991). Adapting instructional design to project circumstance: The layers of necessity model. Educational Technology, 31 (7), 48-52.

Smith and Ragan model

The following lesson was created by Dr. Eggers of Youngstown State University, One University Plaza, Youngstown, Ohio using RealOne. When you get to this presentation, you will need either speakers connected to your computer or you will need to have headphones connected to the computer that you are using.

"Smith and Ragan model" Lesson by Dr. Eggers

THE HOLLAND PROCESS MODEL (HPM)

- A systematic approach to learning — incorporates:

DEFINING learning outcomes and goals

ANALYZING needs, knowledge, abilities, conditions of performance, learning tools and equipment, and the learning environment.

DESIGNING instructional objectives and matching assessments, and sequencing instruction for appropriate entry- and exit-level abilities.

DEVELOPING learning events and instructional materials

IMPLEMENTING interactive instruction based on principles of adult learning

ASSESSING student learning, and . . .

EVALUATING the learning and the process on a continuous basis.