



## CHAPTER ONE

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# WHY ISD HAS DIFFICULTY ADDRESSING BUSINESS ISSUES

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**I**nstructional systems design (ISD) is at the core of any training program. Virtually every training program that is developed today is done using ISD or some variation of it. As an approach to designing engaging instruction, ISD is unrivaled. As a methodology for developing training programs that address business issues, it doesn't work.

Contemporary thinking has sparked increased concern on the part of business professionals about the ability of programs developed using this methodology to address business issues or solve real business problems. This concern has affected the perception that corporate executives have of their training organizations. According to an Accenture 2004 workforce survey, 40 percent of the CEOs who participated were either ambivalent or dissatisfied with their company's training function. These same executives also rated boosting workforce productivity and agility as the most important training initiative, but only 17 percent of those were very satisfied with their training function's ability to deliver in that area. It has been said that perception is reality. The perception of the executives from the Accenture survey gives training professionals a disturbing reality: training programs developed using the ISD methodology are not producing results that are meeting the expectations of business executives.

In fact, ISD was never intended to address business issues; the process itself is devoid of techniques that are dedicated to addressing business concerns. Although there are several variations of ISD, each suffers from the same flaw: a lack of tools and techniques dedicated to solving business problems.

This chapter explores why ISD doesn't do a good job of addressing business issues or solving real business problems. It begins with an overview of the ISD methodology that will make clear what ISD was actually intended to accomplish. It then briefly explores the history of this approach to developing training programs, which will uncover why the methodology has been less than successful. Finally, it looks at two popular variations of this approach that claim to produce effective training programs and exposes the weaknesses of those approaches.

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## What Is ISD?

Instructional systems design is a methodology or process that educators and training professionals use to design instruction. According to Kevin Kruse, the e-learning guru, it is “the most widely used methodology for developing new training programs” ([http://www.e-learningguru.com/articles/art2\\_1.htm](http://www.e-learningguru.com/articles/art2_1.htm)). The stated purpose of ISD is to improve human performance, and the methodology is based on the premise that learning should not occur in a disorganized way; rather, it should be developed in harmony with methodical processes, tailored to a target audience, and have measurable outcomes. The popular glossary of terms, also powered by e-learningguru.com, describes ISD as the “[t]erm describing the systematic use of principles of instruction to ensure that learners acquire the skills and knowledge essential for successful completion of overtly specified performance goals” (<http://www.e-learningguru.com/glossary/i.htm>). Similar descriptions or understandings of ISD can be found in the corporate sector and academia. ICF Consulting asserts that “ISD consists of analyzing what is to be learned, planning an intervention that establishes the conditions for learning, and producing and refining instructional or non-instructional interventions until the specified performance objectives are met” (<http://www.icfconsulting.com/Services/Training/trng-isd.asp>). And the Southern Illinois University education program states that “Instructional Systems design basically focuses on how systems engineering can be applied toward the design of effective instruction” ([http://www.siue.edu/~dknowlt/IT510/IT510\\_main.html](http://www.siue.edu/~dknowlt/IT510/IT510_main.html)). According to these and other definitions, the purpose of ISD is to ensure effective instruction, not to solve business problems or result in business impact. Because of its intended purpose, the methodology is equipped with tools, techniques, and approaches dedicated to ensuring effective instruction but lacking the components needed for achieving business goals.

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## History of ISD

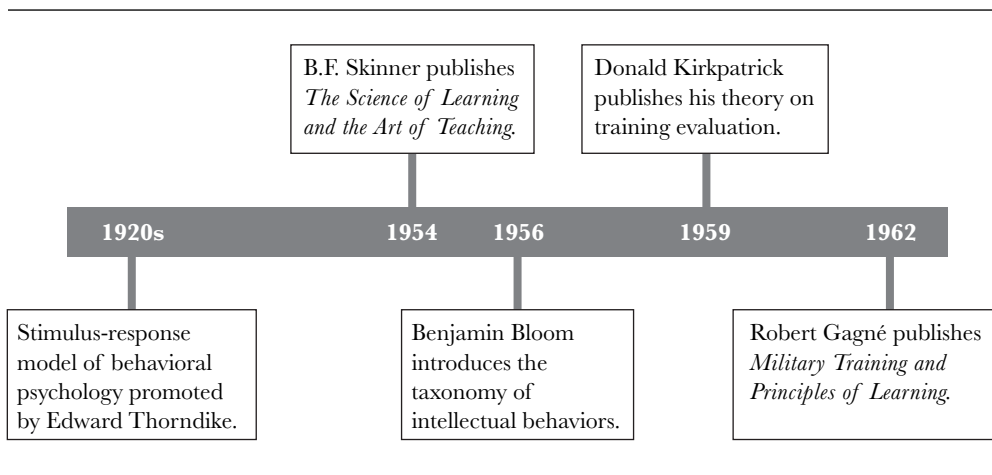
As a formal discipline, ISD has been a long time in the making. Some experts credit the contributions of early philosophers such as Aristotle as the basis for the current philosophies of learning. Others credit psychologist Edward Thorndike,

who in the 1920s promoted the stimulus-response model of behavioral psychology. B. F. Skinner, however, is considered by most to be the originator of contemporary instructional design. In 1954 he published *The Science of Learning and the Art of Teaching*, which initiated a shift away from the uninformed application of instructional technology and toward the formulation of more theoretical models of learning. The next major milestone in ISD was reached in 1956 when Benjamin Bloom, an educational psychologist at the University of Chicago, published his taxonomy of intellectual behaviors (Bloom, 1956).

In 1965 psychologist Robert Gagné extended Bloom's thinking to include nine instructional events that detail the conditions necessary for learning to occur. These events have long since been used for the basis for the design of instruction and the selection of appropriate media.

No discussion of ISD would be complete without mentioning the contributions of Donald Kirkpatrick, the father of training evaluation. In 1959 he published his theory on training evaluation in a series of articles in the *U.S. Training and Development Journal*. Subsequently these articles were incorporated into Kirkpatrick's book, *Evaluating Training Programs* (1975). His theory has now become the most widely used and popular model for the evaluation of training programs. Figure 1.1 shows a time line of the history of ISD.

**FIGURE 1.1. A TIME LINE OF ISD.**



At this point some readers might be wondering why so much attention is being paid to the history of ISD and the individuals who shaped this methodology. The answer is that in order to appreciate why this approach to training development has shown an inability to communicate the value of training to businesses,

one must first understand the factors and the individuals who forged the underlying philosophy of the approach.

Gagné, who was responsible for the nine steps of instruction, was an Ivy League–trained psychologist. Bloom, who contributed his taxonomy, earned a Ph.D. in education from the University of Chicago. Skinner also had a Ph.D. in psychology. In short, the training and background of the major contributors to the methodology were heavy in human behavior and education but virtually devoid of any business acumen. The backgrounds of ISD founders account for the focus and philosophy of the approach of being concerned with behavior and human performance, not business impact.

As ISD has matured, several variations of the approach have arisen, with each new approach claiming that its model is more conducive to developing effective instruction. As we shall see in the next section, each of these versions of ISD suffers from the same flaw: a lack of business tools and techniques.

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## ISD Models

The most basic ISD is a five-phase approach: analysis, design, development, implementation, and evaluation, referred to as the ADDIE model.

The maturation of ISD and the increased introduction of technology into training programs have led to dozens of variations to the ADDIE model. Two of the more popular are the ROPES model, developed specifically to address e-learning, and the Dick and Carey model, credited with offering cost-effective implementation and highly effective learning outcomes for the adult learners. We will look at both approaches to get an understanding of how each claims to be different or more effective yet suffers from the same flaw.

### ADDIE

The ADDIE instructional design model provides a step-by-step process that helps training specialists plan and create training programs. In the analysis phase, the designer develops a clear understanding of the gaps between the desired outcomes or behaviors and the audience’s existing knowledge and skills. The design phase documents specific learning objectives, assessment instruments, exercises, and content. The creation of learning materials is completed in the development phase. During implementation, these materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is evaluated. Each phase has an objective to accomplish,

activities that must take place, tools to help accomplish the objectives, and outputs that feed into the next phase.

The five phases of ADDIE essentially answer these questions:

1. What needs to be learned?
2. How should we teach it?
3. Does our prototype match our design?
4. Was the class attended?
5. Was the training accomplished?

Figure 1.2 shows the questions that ADDIE answers.

### FIGURE 1.2. WHAT ADDIE ANSWERS.

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<b>A</b>	<b>Analyze</b> What needs to be learned?
<b>D</b>	<b>Design</b> How should we teach it?
<b>D</b>	<b>Develop</b> Does our prototype match our design?
<b>I</b>	<b>Implement</b> Was the class attended?
<b>E</b>	<b>Evaluate</b> Was the instruction successful?

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**Analyze.** The objective of the analyze phase is to determine what the student needs to learn. During this phase, instructional designers typically rely on four approaches to analyze training and requirements: a training needs assessment, a job-task analysis, a learner analysis, and a context analysis. Some of the activities that take place during this phase are population analysis, task analysis, and problem identification. The designer uses surveys, task analysis forms, and population analysis forms as tools and delivers learner profiles, task analysis, and a description of constraints at the end of the phase. Figure 1.3 provides a graphical view of some of the objectives, activities, tools, and deliverables that are expected as a result of this phase.

**Design.** Design has been called the blueprinting stage of instructional design. The objective of this phase is to determine what needs to be learned. Instructional

**FIGURE 1.3. ADDIE ANALYZE PHASE.**

Objective	Activities	Tools	Deliverables
To determine what needs to be learned	Needs assessment Problem identification Task analysis Population analysis	Task analysis Population analysis Surveys	Learner profile Task analysis Description of constraints

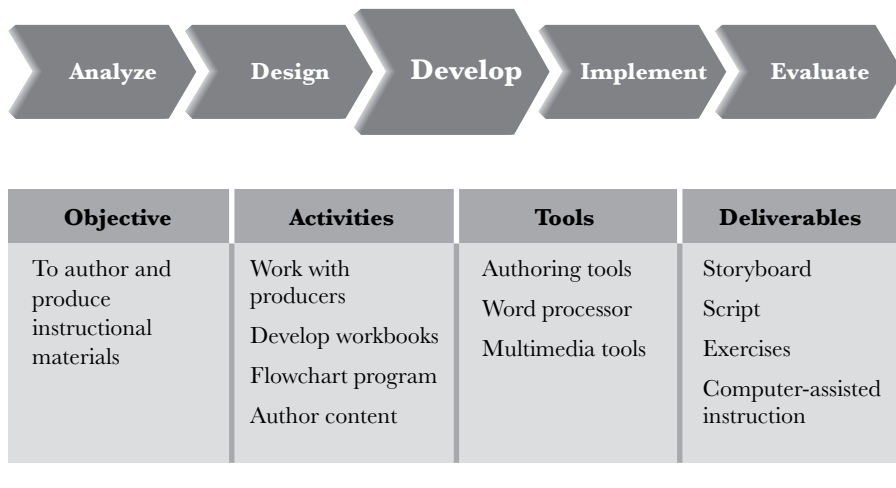
designers identify all the specifications necessary to complete the project. They write learning objectives, develop test items, construct course content, plan or develop instructional strategies and methods, and identify resources. Some of the tools used to accomplish these activities include measurable verbs, performance agreement charts, and Bloom's taxonomy (see Figure 1.4).

**FIGURE 1.4. ISD DESIGN PHASE.**

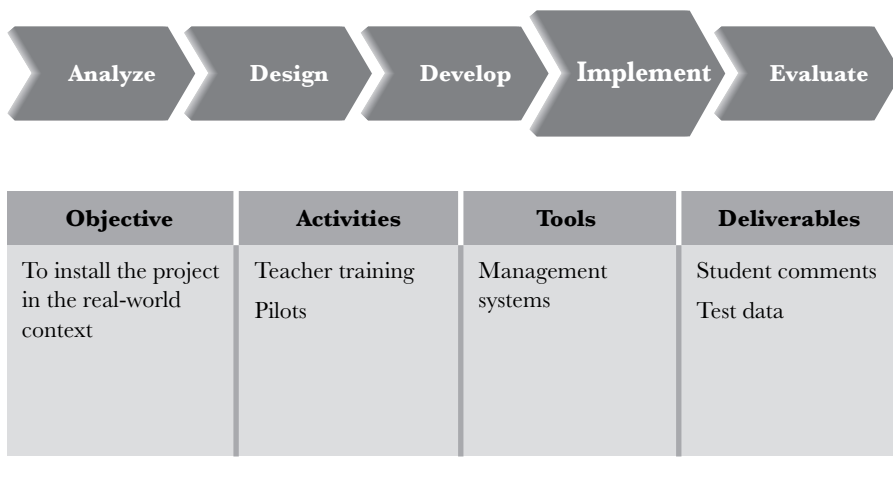
Objective	Activities	Tools	Deliverables
To specify how the tasks identified in analyze are to be learned	Write objectives Develop test items Plan instruction Identify resources	Measurable verbs Performance agreement chart Bloom's taxonomy	Measurable objectives Instructional strategy Prototype specifications

**Develop.** The objective of the develop phase is to produce the instructional materials that will be used in the training program—for example, course materials, learning activities, lesson plans, leader’s guide tests, and other assessment materials. The activities that take place include working with authors, flowcharting the course, and producing workbooks. Training development is no longer limited to print materials and stand-up training in a classroom; instructional designers now must consider producing audio, video, computer-based, and Web-based course materials using computer platforms, distance learning networks, intranets, the Internet, and a host of other delivery options. The tools used in this phase include authoring tools, multimedia tools, and word processors. Some outputs might be the actual workbooks and exercises. In the case of e-delivery, the outputs might include storyboards or completed electronic courses. Figure 1.5 shows the objectives, activities, tools, and deliverables of this phase of ISD.

**FIGURE 1.5. ISD DEVELOP PHASE.**



**Implement.** In the implement phase, the course is installed into a real-world environment. Some of the activities that take place might include pilot tests and revisions, full-scale production, or train-the-trainer or even full-scale delivery. There are a variety of management tools that assist with this endeavor. The outputs of this phase include student data, assessment scores, and survey feedback (Figure 1.6).

**FIGURE 1.6. ISD IMPLEMENT PHASE.**

**Evaluate.** As an official process, evaluation is the last phase in the ADDIE model. Although many instructional designers are proponents of iterative evaluation, the tactic formally takes place only at the end. Two types of evaluation may be done: formative and summative. *Formative evaluation* refers to assessments of the instruction process that are designed to improve it. *Summative evaluation* refers to assessments of the impact of instruction, which are designed to determine whether training programs have achieved their objectives. The deliverables from this phase include a formal project report as well as recommendations (Figure 1.7).

**What's Wrong with ADDIE?** A glance at the phases of the ADDIE process and a quick review of the desired outcome of each show an emphasis on identifying learning requirements, creating measurable learning objectives, designing learning activities that ensure students master the objectives, and then measuring to see if the students have met the course objectives. The overwhelming strength of ADDIE is its ability to create sound instruction. As an approach to training development, the methodology is robust with tools and activities that address instruction. In terms of business objectives, outcomes, and deliverables and its ability to identify business problems, however, the approach is weak. It should be clear from the review of each of the phases that the ADDIE model contains no formal business tools and has no activities dedicated to business issues. Without such tools and activities, it is impossible to develop training programs that address business issues.

**FIGURE 1.7. ISD EVALUATE PHASE.**

Objective	Activities	Tools	Deliverables
To determine the adequacy of the instruction	Record time data Interpret test results Survey graduates Revise activities	Level 1 evaluations Assessments Surveys	Recommendations Project report Revised prototype

Note: Level I Evaluations refer to the measurement of reaction as proposed by Dr. Kirkpatrick.

## ROPES

ROPES is an acronym for the first letters of each step in the development model: relate, overview, present, exercise, and summarize. This methodology, which was jointly developed by Jim Moshinskie of Baylor University and the Vuepoint Corporation, supports the development of e-learning courses.

**Relate.** The purpose of this step is to relate the new material to the trainees so they will begin to think how the topic will integrate, or mix, with other material they already know. Cognitive psychologists say that this relating procedure, called advance organizers, is necessary because it helps the trainees piece everything together into a united whole.

**Overview.** This module overview has three specific functions: present the objective of the module, give the agenda for the module, and tell why the module is important.

**Present.** The information is presented to the learners by chunking the content into separate lessons. The new knowledge, skills, and attitudes that students need to acquire are presented here.

**Exercise.** In this step, trainees explore, practice, and interact with the material covered in each topic or lesson. They become active participants in the instruction.

**Summarize.** The final step is to summarize the module. After the learner finishes all of the lessons in a module, a summary of the content is presented.

**What's Wrong with ROPES?** ROPES focuses exclusively on how to deliver instruction. From the perspective of a cognitive scientist, it is a sound approach to training delivery based on proven principles. Some instructional designers have suggested that the entire ROPES methodology could be included as part of either the design or implement phase of ADDIE. In terms of addressing business issues, however, ROPES is even weaker than ADDIE. The approach contains no components for any type of analysis.

## Dick and Carey

The Dick and Carey method of designing instruction is called the systematic design of instruction. This process, which is named for its founders Walter Dick and Lou Carey, is based on the idea that there is a predictable and reliable link between a stimulus (instructional materials) and the response that it produces in a learner (learning of the materials). This model prescribes a methodology for designing instruction based on breaking instruction down into smaller components specifically targeted on the skills and knowledge to be taught. And it supplies the appropriate conditions for the learning of these outcomes. It uses a four-step approach to training design and development: assess the needs, write the performance objectives, develop and select the appropriate instruction, and design and conduct a formative evaluation.

**Phase 1: Assess Needs.** This phase answers two questions: Where are we? and Where do we want to be? The designer must ascertain what learners will be able to do when they have completed the instruction and identify if the goal will require the learners to use the psychomotor, verbal, intellectual, or attitude domain. Two major activities take place in this phase:

1. Analyze the instructional goal. This is accomplished by listing all the skills needed to complete the task, including subordinate skills—in other words, task analysis.
2. Analyze the needs of the audience. This task is accomplished by identifying what factors affect the learners and is accomplished by using surveys, questionnaires, observations, and existing records to gather information.

**Phase 2: Write Performance Objectives.** The specific behavior skills to be learned, the conditions under which they must be performed, and the criteria for successful performance are used to develop assessment instruments. Assessments based on specific objectives are created, and then instructional strategies are developed. These strategies to achieve the terminal objective are identified, with an emphasis on Gagné's nine events of instruction (1962):

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

**Phase 3: Develop and Select Instruction.** In this phase, the designer produces small chunks of instructional materials that have meaning for the learner. These chunks may include interactions such as discussions, case studies, and scenarios.

**Phase 4: Design and Conduct Formative Evaluation.** Instructional materials are tested in one-to-one, small group, or field evaluations prior to distribution. Data from the formative evaluation are summarized and interpreted in order to identify any difficulties that learners experienced in attempting to achieve the objectives.

**What's Wrong with Dick and Carey?** This approach, like the other two, focuses entirely on instructional analysis, audience analysis, instructional strategies, and the evaluation of the success of those strategies. It uses the same tools and techniques as ADDIE and shares its weakness: the lack of any formal tools techniques, or approaches for identifying and solving business problems.

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## Summary

As a methodology for designing engaging instruction, ISD is unrivaled. As an approach for developing training programs that address business issues, however, it doesn't work because it was never intended to solve business problems. There are various versions of ISD, each claiming to be more effective at developing effective instruction, but all have the same flaw: a lack of business tools, techniques, and approaches.

This chapter provided an overview of ISD. It looked at the purpose and the history of the approach by which virtually all training programs are developed and examined the ADDIE, the ROPES, and Dick and Carey methodologies, discussing the strengths and weaknesses of each in developing sound instruction and presenting business solutions. The next chapter introduces Six Sigma, a methodology with a track record of solving business problems and with a tool kit of business tools, techniques, and approaches.