

Chapter 1

Introduction

Quality Instruction

To create quality instruction, you need to make two types of decisions well: what to teach and how to teach it.

It's that simple, right? Well In the words of that famous philosopher, Rent A. Hertz, "Not exactly." How do you make good decisions about what to teach? And how do you make good decisions about how to teach it?

The purpose of this booklet is to address the first part of these two questions: scope and sequence, or what to teach and what order to teach it. I plan to create additional booklets to address the rest of "how to teach it."

Context of Scope and Sequence

Where do scope and sequence fit within the broader process of creating quality instruction? It is helpful to think of that process as a series of decisions about the instruction-to-be, such as the following:

1. Intervention Decisions
2. Fuzzy Vision of Ends & Means
3. Scope & Sequence Decisions
4. Decisions about what instruction to select and what to produce
5. Approach Decisions
6. Tactic Decisions
7. Media Selection Decisions
8. Media Utilization Decisions
9. Prototype Development
10. Mass Production of Instruction
11. Evaluation of Worth and Value
12. Implementation, Adoption, Organizational Change

Each of those decisions requires that some **analysis** activities be conducted to collect the information required to make the decision, such as needs analysis for intervention decisions. Each requires some **synthesis** activities to make the decision. Each should be followed by some **formative evaluation** activities to make sure the decision was a good one or to improve it before it becomes expensive to change. And each should be accompanied by some decisions and activities on **organizational change** processes that will facilitate implementation of the instruction.

Therefore, the process of creating quality instruction can be viewed as a series of ASEC cycles (analysis, synthesis, evaluation, change), like this:

CHANGE:	Analysis	Synthesis	Evaluation	Org. Change
1. Intervention Decisions	1.1	1.2	1.3	1.4
INSTRUCTIONAL DESIGN:	Analysis	Synthesis	Evaluation	Org. Change
2. Fuzzy Vision of Ends & Means	2.1	2.2	2.3	2.4
3. Scope & Sequence Decisions	3.1	3.2	3.3	3.4
4. Decisions about what instruction to select and what to produce	4.1	4.2	4.3	4.4
5. Approach Decisions	5.1	5.2	5.3	5.4
6. Tactic Decisions	6.1	6.2	6.3	6.4
7. Media Selection Decisions	7.1	7.2	7.3	7.4
8. Media Utilization Decisions	8.1	8.2	8.3	8.4
DEVELOPMENT	Plan	Do	Check	Org. Change
9. Prototype Development	9.1	9.2	9.3	9.4
10. Mass Production of Instruction	10.1	10.2	10.3	10.4
EVALUATION & CHANGE:	Analysis	Des./Devel	Evaluation	Org. Change
11. Evaluation of Worth and Value	11.1	11.2	11.3	11.4
12. Implementation, Adoption, Organiz'l Change	12.1	12.2	12.3	12.4

Figure 1.1 The ISD Process

In this booklet, we will deal with blocks 3.1 and 3.2 only.

1. Intervention Decisions

These decisions have to do with broader issues of why you are considering instruction at all. Intervention decisions can take a partial systemic or total systemic approach.

If you take a **partial systemic approach**, you identify one or more of the organization's performance problems, you analyze *all* the causes of, and potential solutions to, those problems, and you select the best set of solutions. They may include changes in the incentive systems, equipment, work processes, and/or management systems—as well as the knowledge and skills—of the employees or customers.¹ For Activity 1, you just *plan* the set of interventions that will best solve your problem(s). Implementation of those plans comes later.

If you take a **total systemic approach**, you will strive to be a "learning organization" (Senge, 1990), which means you will start by looking outside the organization to the relationships between the organization and its customers¹. How well is the organization meeting its customers' needs? How are their needs changing? Do they (or other potential customers) have other needs that are not being met well, that you might be able to respond to? For Activity 1, you just *plan* the set of interventions that will best respond to those needs. Implementation of those plans comes later.

Regardless of which approach you take, you only proceed with the ISD process if one of your solutions is to correct a knowledge or skill deficiency in the employees or customers.

2. Fuzzy Vision of the Ends and Means

The ISD process should have a **visioning activity** shortly after the needs analysis. This activity should entail having all the stakeholders for the instructional system under design come to consensus on a fuzzy image of what the instruction will be like, both in terms of **ends** (how the learners should be different as a result of it) and **means** (how those changes in the learners should be fostered). This is an opportunity for all the stakeholders to share their values about both ends and means and to reach some consensus on values, so that there will be no major disappointments, misunderstandings, or resistance when it comes time for implementation. This vision should be revised and clarified in progressive iterations as the ISD process proceeds.

¹ I use the term "customers" in the broader sense of all those the organization serves.

3. Scope and Sequence Decisions

Scope decisions are decisions about what to teach—the nature of the content.² They require decisions about what the learner needs and/or wants to learn. **Sequence decisions** are concerned with how to *group* and *order* the content. They require decisions about how to break up the content into "bite-sized" chunks, how to sequence those chunks, and how to sequence the content within each chunk. How to make these decisions is the focus of this booklet.

4. Decisions about What Instruction To Select and What To Produce

Regardless of what you need to teach or learn, chances are that someone has already developed instruction for it. You can often save yourself a lot of time and money by obtaining existing instruction. To do so, you first must identify the alternatives (existing instruction), evaluate their quality in relation to your needs and conditions, procure the most cost-effective alternative, and make whatever revisions are cost-effective. The revision process entails conducting many of the remaining decisions (Activities 4-10). In most cases, you will need to develop some new instruction in addition to revising existing the instruction.

5. Approach Decisions

The systems concept of equifinality tells us that there is usually more than one way to accomplish any given end. Different teachers or trainers will often use very different approaches to teach the same content, including various kinds of expository instruction (such as lecture, tutorial, and drill and practice), various kinds of inquiry or discovery instruction (such as problem-based learning and Socratic dialogue), and various kinds of experiential learning, such as problem-based learning, project-based learning, and simulation). Different approaches may also entail teaching individual students, small groups or teams, or large groups. Decisions about approach are decisions that will impact much of the rest of the design of the instruction and therefore should be made early in the ISD process.

² I use the term "content" to refer to everything that comes under "what to teach." It therefore, includes whatever tasks you might teach as well as whatever knowledge, and the term "content analysis" includes "task analysis."

6. Tactic Decisions

As approaches are strategic decisions, their effective implementation requires tactical decisions. Different types of learning are fostered by different types of instructional tactics, regardless of what approach you use. For example, it is difficult to acquire a skill without practicing it and receiving feedback on that practice. Demonstrations and explanations (generalities) can be very helpful as well. On the other hand, understanding is best fostered by linking new knowledge with related prior knowledge of the learner. This may entail use of such tactics as analogies, comparison and contrast, context, and relating to experiential knowledge of the learner. Memorization and higher-order thinking skills are other types of learning that require very different kinds of instructional tactics. (See Leshin, Pollock, & Reigeluth, 1992, for an in-depth treatment of instructional tactics.)

7. Media Selection Decisions

There has to be some medium (or combination of media) for communication with the learner, such as a teacher, textbook, or multimedia program. In addition to the primary medium(a), the cost-effectiveness of instruction can be influenced by support media, such as blackboards, paper handouts or worksheets, and overhead projectors. Different media have different capabilities that are better or worse suited for different learning situations. Media selection decisions are influenced by both the effectiveness of each option, based on its particular capabilities, and the cost of each option, including both fixed and variable costs. (Variable costs are ones that vary depending on the number of students or the number of times the instruction is used, such as the cost of print materials. Fixed costs are all others, such as the cost of development and production of one copy of a multimedia program.)

8. Media Utilization Decisions

These decisions are of two major types: how the medium is used for the content, and how the medium is used in the broader context of the instructional system. With respect to the **content**, decisions must be made about how to take advantage of the capabilities of the medium, in relation to the instructional requirements of the content (including the nature of the instructional tactics). And decisions must be made about the message design for the medium, given the characteristics of the content and the learners. With respect to the **broader context** of the instructional system, decisions must be made about how each resource will be used by the learners.

9. Prototype Development

Prototype development should occur long before the above decisions are made for all the content. Such rapid prototype development may be done for just one module, or even one part of one module, for purposes of communicating an expanded vision to the client and other stakeholders and making revisions in that vision before applying it to the rest of the content. The prototype may or may not utilize all the same media and message design that the expanded vision calls for, but it should be close enough so that the stakeholders will get a good feel for the nature of the instruction, and so that the formative evaluation will yield valuable feedback on the vision.

10. Mass Production of Instruction

Mass production should generally await the completion of field-tested and proven prototypes for the entire instructional system (all the content), because work on later modules may lead you to want to make some revisions in earlier modules. Just-in-time production has the advantages of allowing final revisions as well as delaying large expenses to the latest possible moment.

11. Evaluation of Worth and Value

Summative evaluation is almost always worthwhile, as long as it addresses impact on the overall mission or purpose of the organization. At very least, it should give information about whether or not this particular ISD project was worthwhile. Ideally, it will also help the organization to decide whether or not to continue to invest in ISD projects. It may also yield information about how to increase the worth and value of this particular instructional system, and of ISD projects in general, for the organization.

12. Implementation, Adoption, and Organizational Change

This activity completes the loop (cycle) by returning to the issue of change. Activities 2-11 deal with instructional interventions, to solve problems or meet needs that are at least partially attributable to lack of knowledge or skills in employees or customers. But instructional interventions alone are seldom sufficient to meet an organization's needs or solve its problems. Other interventions must be designed and implemented as well. Instructional developers may or may not be

responsible for those changes, but we should at least be aware of the need for them and try to be a part of whatever team that is responsible for them.

What's Next?

Given this overview of the ISD process, this booklet will focus on Boxes 3.1 and 3.2 on p. 1.2: the analysis and synthesis for decisions on scope and sequence of instruction. Chapter 2 will explore definitions of scope and sequence, why (or when) they are and are not important, and general issues relating to each. Chapter 3 will then provide an understanding of each of several important sequencing strategies. And the remaining chapters will address the "how to" of analysis and design for each of those sequencing strategies.

References

- Leshin, C.B., Pollock, J., and Reigeluth, C.M. (1992). *Instructional Design Strategies and Tactics*. Englewood Cliffs, NJ: Educational Technology Publications.
- Senge, P.M. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York: Currency Doubleday.