Instructional Design

Patricia L. Smith
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To our spouses, without whose constant support, encouragement, and patience this work would not have been possible.

preface

The strongest motivation to write this book came from the questions of our students and other professionals in the field. Some of these questions pertained to changing media capabilities, while others involved the need to speed up the design process. Many questions were the result of the enrichment of theoretical bases contributing to our field. The most urgent questions were in the area of designing instructional strategies. These questions are a product of what we call "the empty box syndrome." In most models or procedures for instructional design, front-end analysis is followed with the procedural step of "design the instructional strategy." Many of our current and former students as well as professional designers report that the information provided in traditional texts is insufficient for individuals to learn how to complete this step. Hence, eight of the seventeen chapters in this text (Chapters 6–13) address the design of instructional strategies. The chapters use Gagné's types of learning outcomes as a framework for designing strategies appropriate to particular types of learning. We have also related these strategies to Bloom's taxonomy and Anderson's division of learning into declarative and procedural components.

Our treatment of instructional strategies is based more heavily on a cognitive psychology theoretical base than most texts; this reflects the paradigm shift in the field of instructional design and instructional technology that many scholars in the field have noted. We hope to provide the young field of instructional psychology with clear descriptions of some prescriptive relationships between the external facilitation of learning, which we call *instruction*, and the internal cognitions that lead to learning.

We have also provided a balanced treatment of both supplantive instructional strategies—in which much cognitive processing is supported or prompted by the instruction—and more generative strategies (such as exploratory learning strategies) in which learners provide more of the instructional events for themselves. A significant difference between our work and traditional instructional design texts is the expansion and rewording of Gagné's events of instruction to reflect both learner-initiated processing and instruction-supplied processing.

Our text also emphasizes the contributions of cognitive psychology to instructional design. For example, Chapter 3 (which addresses learner character-

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istics) underscores the paramount role that the learner plays in the learning act. The text contains many examples that indicate the impact cognitive psychology has had on our field, such as the following: (1) the process for analyzing the cognitive information processing of tasks during task analysis; (2) the discussion of how assessment items may be written to elicit information about the underlying "understanding" of a subject matter; and (3) the use of think-aloud protocols in formative evaluation.

While we have accommodated the paradigm shift from previous views of systems and behaviorist concepts, we have not "thrown out the baby with the bathwater." For example, we have retained the general procedural systems model of instructional design and the specification of targeted outcomes prior to the design of instruction. Reasoned and validated theoretical eclecticism has been a key strength of our field because no single theoretical base provides complete prescriptive principles for the entire design process.

This text is appropriate for all students of instructional design: practicing professionals such as teachers and professors, instructional designers, or training and development professionals; and college students, including graduate students in instructional technology, instructional design and development, instructional media, or educational and instructional psychology. It is also a challenging and comprehensive text for undergraduates who are studying instructional media or teacher education, and other students who will be creating, revising, and implementing systematic instruction. This text would be especially helpful for public education applications due to the current focus on "outcomes-based education" and other movements to improve education by creating logical relationships among instructional goals, activities, assessment, and evaluation. We have supplied examples involving public education, training, and informal education contexts so that readers will not only see how instructional design principles apply within their own environments, but also how they apply in less familiar arenas.

Text Features

Several instructional features that we have found to enhance the learning of instructional design are included in the text:

- In our discussions of the application of critical principles, we have provided many **examples** and some much-needed **nonexamples**. Some of these examples are presented in a narrative form, which promotes students' interest and comprehension.
- One unusual feature of the text is the **Extended Example** for the design of components in an instructional photography course. This section appears at the end of Chapters 2–16, and it exemplifies the major principles presented in each chapter. It has been our experience that while learners benefit from the diversity of short examples within each chapter, they also greatly benefit from seeing the instructional design for one content unfold across the entire instructional design process.
- **Exercises** are embedded within the chapters so that students can monitor their learning as they progress through the chapter. We base the exams that we give our own students on the item specifications from which these Exercises were derived. (Model answers to these Exercises may be obtained from the authors.)

- The text also contains **graphic summaries** that readers can use to organize the content and take notes.
- Finally, many chapters contain **Job Aids**, which summarize the information that learners must obtain and the decisions that they must make to complete each phase of the instructional design process. We expect that learners, instructors, and practicing designers will adapt these Job Aids to more closely match the particular instructional design problems that they encounter.

We envision this text being used in at least four general ways. First of all, it can be used as a beginning instructional design text for a course in which the goals would be the application of individual concepts and principles presented in the text. (The Exercises would be very helpful for students and instructors using the book in this context.) Secondly, the book might be employed in an advanced instructional design course that reviews prerequisite concepts and principles and utilizes the text as a guide for development of an instructional design product. The text could also be used in a manner that ambitiously combines the first two methods described. This is how we use the text in *our* classrooms. Finally, this text might be read as a handbook for practicing instructional designers.

Acknowledgments

We are indebted to our esteemed former professors and colleagues for their ground-breaking scholarship, especially L. J. Briggs, W. Dick, R. M. Gagné, J. Keller, and W. Wager. After writing this text, we more fully realize that we "stand on the shoulders" of our predecessors! We are grateful for the thoughtful questions of our students in EDTE 6163; without their conviction that "the story isn't finished yet," we never would have completed such an enormous five-year project. We are also indebted to the students in this same class for their formative feedback of iterations of the text over the past four years. We must specifically mention Tom Bergman and Mary Beth Smith, who provided us with detailed written feedback over an entire semester. We gratefully acknowledge the insightful and scholarly comments of our reviewers: Brock Allen, San Diego State University; John Belland, Ohio State University; Barry Bratton, University of Iowa; Carol Carrier, University of Minnesota at Minneapolis; Doris Dale, Southern Illinois University at Carbondale; Philip Doughty, Syracuse University; James Farmer, Jr., University of Illinois at Urbana-Champaign; Gary Ferrington, University of Oregon; Barbara Grabowski, Pennsylvania State University; Robert Gray, East Texas State University; Karen Medsker, Marymount University; Tim Newby, Purdue University; Albert Pautler, Jr., SUNY Buffalo; Taher Razik, SUNY Buffalo; Landra Rezabek, Florida State University; and Paul Welliver, Pennsylvania State University. Finally, we acknowledge the guidance and careful attention to our manuscript provided by Linda Sullivan, editor, Macmillan Publishing Company, and Bobby Reed of Proof Positive/Farrowlyne Associates.

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Tillman J. Ragan is a professor in the Instructional Psychology and Technology program at The University of Oklahoma. He received his Ph.D. in Instructional Technology from Syracuse University in 1970. Ragan is the author of five books and numerous articles on instructional technology, and he is a columnist for *Educational Technology* magazine. He has served on many committees and has held the titles of president of the Research and Theory Division of AECT, vice-president of IVLA, and cochair of the Professors of Instructional Design Technology conference in 1992. His area of research and teaching is instructional technology, with specific interests in learner characteristics, visual literacy, and applications of computer technology to instruction.

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Introduction to Instructional Design

Chapter Objectives

At the conclusion of this chapter you should be able to do the following:

- Define *instructional design.*
- Define *instruction,* distinguish it from related terms (such as *education, training,* and *teaching*), and when given descriptions of educational activities, determine which of these are instruction.
- Identify and describe the three major phases of the instructional design process, and when given descriptions and instructional design activities, identify which phase is being employed.
- Describe at least four major assumptions of instructional design and discuss how these assumptions relate to your own philosophy of education.
- Describe advantages of using instructional design.
- State why it is important that instructional designers know the theory bases associated with their field.
- Define and describe the concept and purpose of *theory.*
- Describe each of the major theory bases and the ways in which they have contributed to instructional design practices.
- Given a description of a learning situation, describe how learning occurs according to information processing theory.

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