My disappointment with the book lies in its failure to address some of the more pragmatic issues. The book fails to discuss the relationship between formative evaluation and market research. A failing of some interactive videodisc programs is that they offer so much depth that they actually take longer for students to use: what formative measures should be taken to ensure efficient use of students' time? The cost-effectiveness of formative evaluation is not discussed. If fifty percent improvement in effectiveness of a computer program can be accomplished in the first series of one-on-one trials, how much of the project's budget should be allocated to other formative evaluation activities, and at which phases of the project?

But in all, the development of educational technology products will be the better for the release of this book. I look forward to the release of a second edition, where perhaps there will be room to address some of the more pragmatic issues.

REVIEWER

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Human Learning (2nd Edition) by Thomas H. Leahey and Richard J. Harris, Scarborough, Ontario: Prentice-Hall of Canada, 1989. ISBN O-13-44-52-143 (CDN $61.33)

Reviewed by Reinildes Dias

Human Learning provides a comprehensive and integrative discussion of that complex process which has enabled human beings to achieve scientific, technological, and social improvements throughout the centuries. Human learning is a large and complex field of inquiry, with many sub-fields that deserve attention on the part of those who set out to delineate it. The authors deal with the process of human learning well, describing different theoretical perspectives, illustrative experiments, and examples that provide empirical evidence for their assertions.

Leahey and Harris organize their text around four themes in the psychology of learning: 1) learning and behavior; 2) learning and cognition; 3) learning and biology; and 4) learning and development. The organizational structure aids in the establishment of the integrative character of the book.

The introductory chapter examines human learning from an historical perspective, and reviews concepts and ideas related to copy theory, realism,

idealism, and pragmatism. The four themes around which the book is structured are also introduced and briefly discussed.

Part I, dealing with issues of human learning and behavior discusses the principles underlying conditioning and the traditional and contemporary theories related to it. The contributions of theorists such as Pavlov, Guthrie, Hull, Watson, and Skinner, among others, are described. The focus is on the study of learning in terms of how behavior adjusts itself to the environment, without invoking the attributes of mind to animals. Human learning is presented as behavioral links to the environment without the mediation of the mind.

The authors provide a useful categorization scheme for behavioral psychologists, grouping them as either radical, methodological, or mediational behaviorists. Through this scheme readers are provided with a continuum of positions within the behaviorist group of theorists from the radical viewpoint, which excludes from the science of learning reference to anything that cannot be observed, to the mediational viewpoint, which admits to the presence of mediators (covert behaviors that influence overt responses) in the human learning process.

Part II focuses on the mental cognitive processes that underly human learning. Topics such as memory, forgetting, rehearsal, retrieval, encoding, and problem-solving are explored from a cognitive perspective. Such a perspective integrates assumptions from communication theory, from developments in computer processing, and from studies in artificial intelligence.

The relationship between the computer and the human mind permeates the discussion in Part II. Unlike the behaviorists who use animals as models for the study of human behavior, cognitive psychologists use the computer as their model. The point is made that generally most cognitivists believe that the human mind resembles the computer in that it accepts input through tion, processes input through thought, stores it in memory, and acts on it in making decisions.

Part II also includes an excellent discussion of the role of schema (generally defined as structures of overall knowledge that human beings have stored in their minds) in the processing of information for comprehension. The point is stressed that "spoken or written text does not in itself carry meaning; rather, it provides directions for listeners or readers on how to use their own stored knowledge to retrieve and construct the meaning" (Leahey and Harris, 1989, p. 201).

The point is also made that, like the behaviorists, cognitive psychologists failed to consider the importance of biology in their view of human learning.

Part III explores the relevance of biology to an understanding of the learning process. Attention is focused on two different aspects of biology: the biology of proximate causes highlights revealing aspects of the relationship among learning, memory, and the brain, while the biology of ultimate causes highlights the relationship between learning and evolution.

The chapter on sociobiology explores the biological bases for four major categories of social behavior - altruism, aggression, sexual behavior, and parental care - moving from accounts of animal to human behavior. The point is made that an adequate understanding of human learning requires attention to both cultural and biological factors.

Part IV explores the relationship between learning and development. Topics include the evolution of communication in animals, the mixed results of ape-language studies, speculations on human language evolution, and significant findings on child-language acquisition. Chomsky's position that language is an evolved species-specific entity, rather than the result of learning, cognition, or thinking, is also discussed.

The most influential developmentalist theories are reviewed, contrasted, and related to the learning process. Leahey and Harris note that theorists such as Freud, Erickson, and Kohlberg "merit attention in a book on learning and cognition precisely because they challenge standard notions of behavioral and cognitive learning" (p. 385). Also included in Part IV is a review of social learning theory, an influential and heuristically non-developmentalist theory that offers an alternative to the thinking of developmentalist theorists.

In summary, *Human Learning* provides a clear and comprehensive account of the research in learning and cognition without being simplistic. It has the quality of connecting seemingly divergent ideas in its description of the learning process. The inclusion of the theme of learning and biology, which encompasses sociobiology, makes this book a major contribution to the field, since that perspective is not usually addressed in books on human learning. A most attractive feature in the layout of Human Learning is the use of boxes which provide illustrative examples of the theories being discussed. This feature aids in the organization of the text, and provides a welcome break from the linear format, hence it increases the readability of the book. The authors acknowledge the helpful comments of students who used initial drafts of some chapters, and it is obvious that the feedback from students and teachers has been incorporated in the design of the text, creating a book that can readily be adopted for use in a course on human learning.

What is lacking in *Human Learning* is a discussion of human learning in relation to educational issues. A section which integrates learning and instruction is essential for the instructional designer or educational technologist. Such a discussion could readily become a fifth theme of this book.

Human Learning is of interest to language students and to teachers who do not normally have theoretical information about how learning occurs. It is also of value to instructional designers, who normally deal with the learning process from an application perspective, in the development of instructional materials. The book also meets the needs of the psychology student who is interested in understanding how present theories view the learning process from divergent -though complementary – perspectives. Human Learning integrates apparently disparate ideas in a clear account of this intricate process.

REVIEWER

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Managing Interactive Video/Multimedia Projects, by R.E. Bergman & T.V. Moore. Englewood Cliffs: Educational Technology, 1990. ISBN O-87773 209-1, 215 pages, 39.95 (U.S.).

Reviewed by Richard A. Schwier

INTRODUCTION

This book provides a detailed description of the design and development of large-scale interactive videodisc projects, and couches the discussion within the larger scope of multimedia production. The material draws heavily on the IVD Project Manager's Workshop offered by IBM. Two things leap at the reader at first glance: the material is very comprehensive and well organized, and the focus seems to be on fairly large-scale development projects.

CONTENT AND ORGANIZATION OF THE BOOK

This book is broken into two main sections: a guidebook for multimedia project managers, and a set of resources for project managers. The guidebook sets out a development model and takes the reader through each step in a complete multimedia development project. The second section, in the form of a set of appendices, offers a dizzying array of checklists, forms, design matrices, multimedia documentation, writing advice, references and a glossary.

Section One: The Project Manager's Guide

The Project Manager's Guide is made up of twelve chapters under four major headings: orientation, preparation, construction and implementation and management. These headings represent the major stages in a large development effort. Each chapter is organized into roughly four parts: an introduction (Preview of...); a context and brief overview of the content of the chapter (Looking Over the Territory); the actual content of the chapter; and a brief summary (The Last Word). If it sounds to you like there is a lot of structure to this book, I share your opinion. I found the structure comforting in many