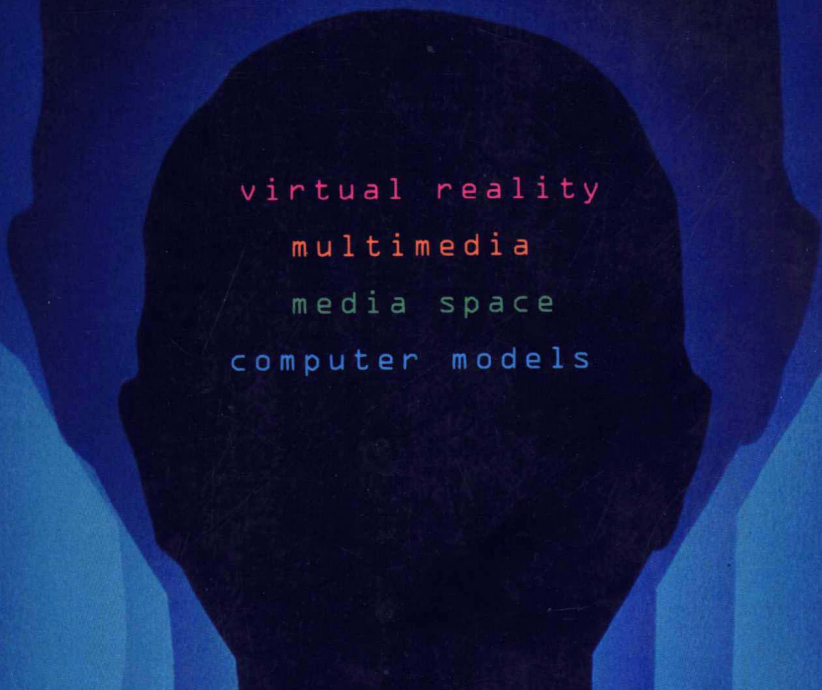


# MIND OVER MEDIA

**Creative Thinking Skills for Electronic Media**

A dark silhouette of a human head and shoulders is centered against a background of layered, translucent blue shapes that resemble stylized waves or digital data. Inside the head, four lines of text are displayed in a monospaced, digital font, each line in a different color: pink, red, green, and blue.

virtual reality  
multimedia  
media space  
computer models

reality  
multisensory  
physical space  
real images

# Mark von Wodtke

# **Mind over Media Creative Thinking Skills for Electronic Media**

Mark von Wodtke

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**Mind over Media:  
Creative Thinking Skills  
for Electronic Media**

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Acknowledgements appear on pages D-1–D-3 and on this page by reference.

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# Preface

The goal of this book is to help you discover more creative ways to use electronic media. This book should enable you to develop beyond conventional cognitive computing and learn creative thinking skills for multimedia computing. Using conventional computing, you typically work with rational modes of thought which emphasize logic. You use a narrow range of media generally involving only data, text, or numbers. Computers are mainly tools, typically with keyboards as the primary user interface. Using more creative approaches to multimedia computing, you can draw upon your whole brain. These approaches work with a broader bandwidth of media involving graphics, images, spatial models, animation, and even video and sound — as well as data, text, and numbers. Electronic media enable you to use computers as a vehicle for accessing shared media space involving a variety of user interfaces. You work with more of your mental capacity when using these approaches.

This goal is rather ambitious. Yet there have been many people who have helped me pursue it, and I greatly appreciate their help. This book really represents a collaborative effort in which I (as the author) have given focus to ideas from many different sources while adding my own insights. I have also found it very helpful to interact with people who have served as sounding boards for presenting these ideas. This book is therefore a product of many people's efforts, and I wish to share the credit. Responsibility for any shortcomings, however, rests with me — the author.

Not much could be written about electronic media were it not for a burgeoning computer industry. This industry is providing a plethora of computer-aided design, multimedia, and virtual reality tools. I am hoping this book will, in turn, help stimulate user demand for the new media and tools which are emerging. As an educator, I find an interesting challenge is helping people learn to use these tools creatively and effectively.

Many people have influenced this work. I only have space to acknowledge a few: The people who have helped me in developing different sections of the book include Russ Pielstick, Rick Moore, and Doreen Nelson. The people I have worked with in developing the case studies are Jules Bister, Dale Lang, Tony Palmisano, Mark Sorensen, and Clark Briggs. In addition, authors such as Betty Edwards, John Lyle, Robert McKim, Robert Johnson, and Ken Wilber have written works that I have drawn heavily upon. Throughout the book, I have made every effort to reference the work of others.

I am deeply indebted to a team of technical reviewers who have provided comments on the manuscript at different stages of its development. These include Steve Harrison, researcher, Xerox Park; William Larson, profes-

sor emeritus of behavior science, Cal Poly, Pomona; Paul MacCready, inventor and engineer; Robert McKim, writer, educator and engineer; Joel Orr, writer, computer consultant, and Autodesk fellow; and Michael Schrage, writer and MIT Media Lab fellow. The review team also includes Christopher Rennie, chair of engineering graphics and design, Pennsylvania Institute of Technology; Kim Manner, lecturer in mechanical engineering, University of Wisconsin–Madison; James Mallory and Anthony Spieker, professors, Rochester Institute of Technology; Sandra Helsel, editor of *Virtual Reality Report*, *Multimedia Review*, and consultant; as well as Nohl Lyons, graduate student, University of Arizona.

My colleagues at Cal Poly, Pomona, have helped me with this project in different ways. Some have read parts of the manuscript; others have provided a stimulus in team-teaching situations. At the university level I wish to thank Dr. Weller, our former vice president, who granted me a leave in 1983 which started me on this journey. I also wish to thank Carol Holder, director of faculty development, for her encouragement and exceptional workshop, “Writing across the Disciplines.” In our College of Environmental Design, I thank Marvin Malecha FAIA, our dean, for continued support which has included a sabbatical leave in 1990 to work on this manuscript. I also want to thank many colleagues in our College of Environmental Design. Sylvia White guided me in developing the proposal for this book. Branko Kolarevic, Jeff Olson, John Lyle, Felix Barreto, Hersh Farbarow, and Robert Perry gave me helpful comments on the manuscript.

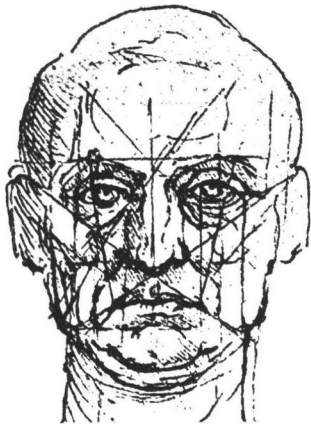
My architectural and landscape architectural firm—CEDG, Inc. (the Claremont Environmental Design Group)—has provided a tremendous amount of support for this project. It has also been a proving ground for many of the ideas. My partner Brooks Cavin has engaged in discussions on many facets of the book and continually brought new material to my attention. Mary Reeves has been an able assistant preparing the manuscript and getting the necessary permissions. Long Ha has handled the graphic production effectively and with flair. Others including Curtiss Johnson, Diann Durant, Ignacio Sardinas, Woody Smeck, and Steve Pomerence have offered helpful comments on the manuscript.

My father and my brother Henry as well as my sister-in-law Janet von Wodtke have provided important moral support for this project. And finally I wish to thank my own family for patience and understanding while I have been physically at home but mentally in media space when working on this book. My children, Kirsten, Erik, and William have taught me a great deal about learning and growing. And last, but not least, special thanks goes to my wife, Carla. Not only has she endured living with this book; she has helped in many ways.

*Mark von Wodtke*

# About Using This Book

You probably already have some favorite ways to explore ideas, but you may not be using your full potential. This book will help you discover ways you can use electronic media more creatively. A key to exploring ideas is to learn creative thinking skills. They are rather abstract notions which I find easier to diagram than to just write about. Consequently, I am presenting these thinking skills to you by integrating graphics with the text in this book. The diagrams will help you quickly catch on to approaches for using electronic media creatively.



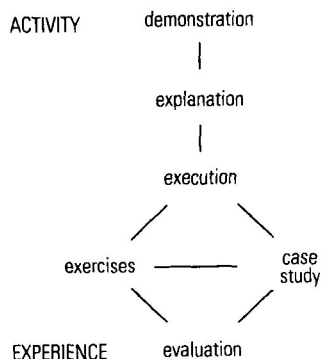
**Sketch**  
by Leonardo da Vinci

There are long traditions of exploring ideas through sketching and writing. Leonardo da Vinci's sketchbooks are classic examples. The layout of this book, *Mind over Media*, involves two channels — visual and verbal. The visual channel appears on the left side of the page and contains images, diagrams, or sometimes illustrative quotes and definitions. The verbal channel, or text, appears on the right side of the page. Graphics or text may take the whole page where appropriate. Some of you may relate more to the text and others more to the graphics. Absorb the text and graphics together. The images help visualization and recall. The text provides elaboration needed for fuller understanding.

Preview each chapter by browsing the graphics and skimming the text. Previewing provides a sense of the contents and organization. Where you find the material new, draw upon both channels to gain an understanding of the chapter. This may be particularly helpful if you are reading English as a second language. Readers familiar with many of the concepts can use the visual channel to get an overview and quickly find areas of interest. This will also help you continue to use this book as a guide after you have read it.

Appendix A contains a chart that provides an overview of the approach this book presents for learning creative thinking skills for electronic media. The goals are ambitious; however, ambitious goals can help you reach your full potential. The chart summarizes principles related to the goals. There are also strategies for using the principles. This chart also lists the activities provided at the end of each chapter. The activities provide challenging ways of experiencing the thinking skills. They help you relate these goals, principles, and strategies to your own discipline and computer environment.

Use this book on universal thinking skills with other books which provide the knowledge base needed for your discipline. *Mind over Media*, used together with current software and hardware application guides, can help you learn to work with electronic media more creatively.



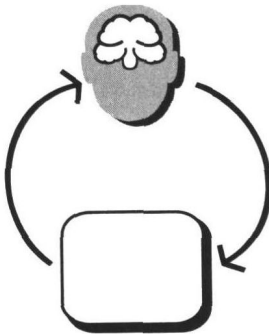
## Activities to Experience

Each chapter of this book begins with a brief overview. Headings provide a sense of the objectives and organization. Diagrams illustrate important ideas and procedures. Examples demonstrate thinking skills presented in this book. *Italics* identify terms with definitions that appear in the left column. The definitions appear again in Appendix B, which is a glossary at the end of the book. Here you can look the terms up alphabetically.

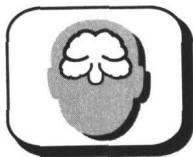
The body of this book presents creative thinking skills that relate to many disciplines. Chapter 7 presents four case studies. The first examines how an award-winning animator uses these approaches. The second describes how architects, landscape architects, and engineers can work together using electronic media. The third discusses how planners use electronic media to plan new communities in Japan. The final study shows how scientists and engineers create models of space vehicles to design and test hardware for outer space exploration. Cross-fertilization of thinking is beneficial. You will discover useful approaches can grow from disciplines other than your own. Ideas come from your mind; computer applications are simply tools to explore ideas using electronic media. Many disciplines involve similar creative thinking skills. Although disciplines deal with different knowledge bases, the computer applications we use are often the same. We can share this common ground in *Mind over Media*.



### **Part I: Thinking**



### **Part II: Interacting**



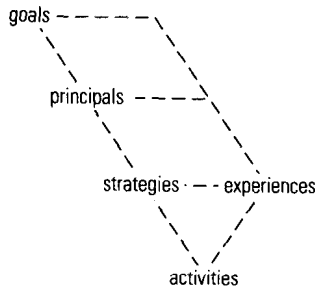
### **Part III: Mastering**

There are three parts to this book. The first part focuses on the mind by discussing creative thinking skills and how you can use them. The second part of the book focuses on the interaction between your mind and electronic media by presenting approaches that will help you use computers creatively. The third part of the book helps you use your mind to master using electronic media by teaching you how to draw from deeper levels of consciousness, approach user interfaces, and mix the media you are using. This last part of the book also helps you address changes involved in using electronic media to a greater extent.

Each chapter of this book ends with activities. They have no finite solutions, but are intended to get you thinking. You can do some of the exercises in your head. Others you can do with pencil on paper. Still others involve various computer applications. All involve creativity. Try the activities; they provide a crucial step in making these approaches your own. These mental exercises can massage your mind. They provide a focus for each chapter of this book. Through the activities you can transfer the goals, principles, and strategies, described in each chapter, into experiences. Those experiences help you apply creative thinking skills to your discipline and computer environment. The activities are challenging in order to help you develop your mental capacity. They will help you learn thinking skills necessary for multimedia computing.

Each activity contains a brief demonstration and explanation of the thinking skills involved. Then it suggests an exercise you could do to experience these ideas. In addition, the exercise proposes approaches you could use to apply these thinking skills to case studies of your own.

ABSTRACT



CONCRETE

### **Relating Goals to Experiences**

Also included are suggestions on how you might evaluate your experiences.

Appendix C contains a bibliography listing references alphabetically. There is also an index at the end of the book.

You can obtain the *Instructor's Guide* from the publisher when you adopt this book for your class or workgroup. This guide contains masters for transparencies of key diagrams from each chapter for use in lectures and workgroup discussions. These diagrams are also available in color slides. You can purchase the set of 114 high-resolution, color, 35-mm slides of the diagrams in the *Instructor's Guide* by ordering it through your McGraw-Hill representative or the McGraw-Hill Electronic Bookstore on CompuServe. I can also make the graphic files available to you should you wish to incorporate them into supplementary material. These digital graphics should work with computer programs that can display Encapsulated Postscript files.

*Mind over Media* may be available through Primis — McGraw-Hill's electronic publishing system. They can print and deliver any portion of this material you order specifically for your course or workshop. Contact your McGraw-Hill representative for details.

You understand your own disciplines and changing computer environments better than I do. Tell me about the discoveries you make when doing the activities in the book. Please share supplementary material you develop for your own disciplines and favorite computer environments. Maybe you also have ideas for other activities that help you learn creative thinking skills. You can share supplementary material and activities with colleagues online.

Reach me via Internet at [MJVONWODTKE@CSUPOMONA.EDU](mailto:MJVONWODTKE@CSUPOMONA.EDU). It is my hope that this book can continue to evolve, responding to the needs and interests of you — the user — as well as to the developments in the computer industry.

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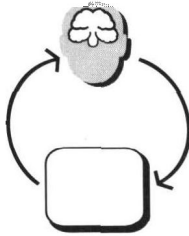
## Part I

# Thinking



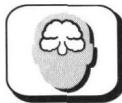
### Part I Thinking

provides a foundation in visual thinking and creative thought processes. This is especially helpful in **design methods courses**.



### Part II Interacting

provides approaches for involving electronic media more creatively. This is especially helpful in **case study courses**.



### Part III Mastering

provides a direction for getting the most out of your mind when using electronic media. This will help you **address change**.

Appendix A  
Appendix B  
Appendix C

**Overview**  
**Glossary of Terms**  
**Bibliography**  
**Acknowledgments**  
**Index**

# 1

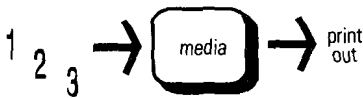
## Exploring Images in Your Mind

Who can use computers creatively? Many people can—in disciplines ranging from art and design, to architecture and engineering, planning and business, and even medicine and science. Students, professionals, educators, executives, clerical workers, and technicians all have the potential to visualize and explore ideas using computers. Keys to being able to do this are thinking skills you can learn. This chapter introduces those thinking skills. Typically, when working with conventional computing, you use primarily left-brain or deductive modes of thought. When working with multimedia computing you need to learn to use right-brain or inductive modes of thought that are more visual and intuitive. This chapter will make you aware of how you can increase your productivity and enhance your creative capabilities using computers.

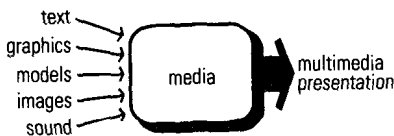
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### Mental Images

Imagine being able to record your dreams. Imagine having the ability to walk through, or even fly through, your mental images, reviewing and refining alternatives as you go. Imagine being able to share your visions with others in multimedia, not just using computer text, but also using graphics, video, and sound. New media for creativity are emerging. You can learn to access these media using computers.



#### Conventional Computing



#### Multimedia "Computing"

Computing originally meant counting and dealt only with numbers and data. You may associate computing with punch cards, keyboards, and near-sighted people wearing horn-rimmed glasses. Today computers transcend that original meaning. The image of computing is changing significantly. In addition to numbers and data, computers now also deal with text, graphics, three-dimensional models, video images, and even sound. You really have new media for expression. Data processing machines have become word processing machines. Graphic workstations have become visualizing machines. You can explore your mental images by using computers, or perhaps put more accurately, by using electronic media.