Reviews

Successful Instructional Diagrams by Ric Lowe, London, Kogan Page, 1993. ISBN: 0-7494-0711-5.

This publication is part of the *Educational and Training Technology* series edited by Chris Bell of the University of Plymouth. It is aimed directly at teachers, trainers and instructional designers who wish to incorporate diagrams into their instructional materials.

The first section of the book deals with diagrams in relation to learning processes and the acquisition of visual, as opposed to textual, information. Although a series of important points are clearly indicated, there is no reference to published work in the field, and this weakens the value of this section of the book. Furthermore, there is a bibliography but it contains just fourteen entries. This is not therefore a book to use in researching visual literacy.

The central section of the work is concerned with the design and production of instructional diagrams, and here there is a wealth of straightforward information and ideas presented in a clear and helpful manner which would benefit even experienced instructional designers. One feature of this section in particular, but also of the book in general, is the use of a common thematic topic (a pepper mill) for exemplary illustrations. This technique allows the writer to focus on specific features of the illustrations without introducing new, distracting information. Having said that, I did feel that the book might have benefited from including, at least in one section, a wider variety of illustrative examples.

The final section is concerned with the role of diagrams in an instructional context and the potential problems which a learner might have in using diagrams. Again the approach is clear and useful.

The book is directed at less experienced instructional designers or those who feel they should be exploiting diagrams more completely. It contains a range of useful procedural checklists, and draws together a number of selected issues ranging from design considerations to evaluation procedures. It is a useful addition to the practitioner's bookshelf.

Dennis Moss, University of Wales at Cardiff

Hypertext in Context by C. McKnight, A. Dillon and J. Richardson, Cambridge University Press, 1991. ISBN 0-521-37488-X.

The term *hypertext* was coined by Theodore Nelson in 1967. He used it to describe interactive systems which combine natural language text with a computer's capacity for interactive branching. Since it is now possible to combine text with a variety of other forms of presentation (such as graphics, audio and video), the term *hypermedia* is now often adopted for such systems, *hypertext* being reserved for applications based on just non-linear text. In this book, however, McKnight *et al* refer to applications which embed document or information linking as *hypertext,* regardless of the modes of presentation they employ. In other words, the term *hypertext* is used in a generic way to refer to electronic documents which utilize any number of presentation modalities.

The book is divided into eight chapters which together chart the development of hypertext from Aristotle (and the earliest notions of inter-connected information) through the history of writing and hypertext applications to future potential.

Chapter 1 provides a discussion of the meaning (or definition) of hypertext and its potential impact on the way people organize information. It is suggested that the 'real' potential of hypertext goes beyond the provision of new ways of reading and writing to fundamental changes in the way people think. This is followed by a discussion of some of the historical highlights in the development of the hypertext paradigm, including mention of some of the key figures in the evolution of the concept.

In Chapter 2, the case for hypertext providing new ways of thinking is further endorsed. However, it is argued that many conceptions about the linearity of traditional textual systems are inaccurate, and the basic character of both oral and written information is questioned. This is used to focus on the idea (popularly attributed to McLuhan) that the medium determines the message. The evolution of written language is then discussed in great detail, with emphasis being given to changes in the style and purpose of written material. Within this context, various techniques for the production of textual resources are described (such as printing and the organization of printed material into books). There is then a discussion of the impact these developments have had on the cognitive skills of readers.

Chapter 3 concentrates on a reader-centred analysis of hypertext. The fact that paper-based text and hypertext constitute different media is noted, and this is followed by a psychological and physiological discussion of reader characteristics. This includes a description of the physical characteristics of the human visual system and the findings of research into the cognitive ergonomics of screen-based text. Then a classification for information types is developed. The classification of textual documents is based on three dimensions which relate to: how they are read, why they are read, and what information they contain. This brings to the fore a clear concern with looking at hypertext in the context of actual tasks, since a simple comparison of the effectiveness of paper-based text as opposed to hypertext is unrealistic without an account of the types of task users wish to perform with the particular information resource in question.

Chapter 4 deals with the idea that departure from linear information structures can cause users to become lost within an information space. The psychology of navigation is discussed both within the context of paper-based and electronic documents, taking into account the types of schemata and models used for navigation within textual environments. The way in which users can construct cognitive maps of the information space is dealt with, along with the ways in which such maps can provide navigational knowledge. There is also an outline of the ways in which metaphors can be used to address navigational problems.

Conversion from text to hypertext is the subject of Chapter 5, where techniques for converting paper-based resources are contrasted with approaches involving the development of original hypertext materials. The underlying structures are also treated, and consideration given to implementations which retain an underlying linear structure while facilitating web-like semantic links throughout the knowledge corpus. Semantic networks are described along with the deficiencies that can result from embedding information within a network structure.

Chapter 6 deals with the potential effectiveness of hypertext within applications aimed at learning and education. A general view of education is briefly covered, followed by a look at the question of whether hypertext can play an effective role in the fulfilment of educational goals viewed in terms of both developmental and performance criteria. Individual learner characteristics are also briefly discussed along with the concept of incidental learning which may occur while browsing.

Chapter 7 presents an outline of a practical implementation of a hypertext system. The *Hypertext Database* is an application intended to support research workers with the objective of discovering whether a hypertext database can be of significant use to people who would ordinarily use a paper-based equivalent. The system is described in detail along with the findings of experimental work into its effectiveness.

The final chapter, not surprisingly, looks at the future potential of hypertext, and identifies some key areas for future research. Areas such as computer supported co-operative work and intelligent hypertext are briefly treated, and an attempt is made to clarify the overall position of the authors with regard to hypertext.

There is a glossary, a reference list, an author index and a subject index - facilities essential in a book like this which makes significant and useful reference to related work. The glossary is atypical, however, since it consists entirely of short descriptions of hypertext systems, not definitions of keywords.

I cannot fully endorse all the ideas presented in this book, but it is readable, and it will no doubt prove useful.

Stephen Richards, University of Teesside

Hypertext: a Psychological Perspective edited by C. McKnight, A. Dillon and J. Richardson, Chichester, Ellis Horwood, 1993. ISBN: 0-13-441643-0.

This is an edited volume of seven chapters, each discussing the design of electronic text and how that design might be informed by psychological theory. Good coverage is given to most of the key controversial issues. This could be a useful book for students as well as a provocative one for researchers active in this area.

The editors adopt a commonplace view that there are really three relevant traditions of psychological theorizing to contemplate. First, there is Behaviourism. Hardly anyone claims Behaviourism as an inspiration any more, but custom requires that it is identified and vigorously dismissed. Certainly, no chapter here represents this position. Secondly, there is cognitive psychology/science. Nick Hammond contributes a very readable chapter exploring the dominant themes from this tradition. He briefly reviews key empirical research, and derives a sort of learning cube: a figure comprising three dimensions of computer-based learning (and finding accommodation for hypertext in a rather murky corner of this shape.)

Behaviourism and Cognitivism differ in their preferred conceptual vocabulary for analysing knowing and learning. In particular, they disagree on the need to theorize in terms of symbols and symbol-relations within private representational systems. This seems a fairly stark alternative: deal with behaviour or with information processing. It is hard to imagine how there could be an in-between perspective. But a third theoretical tradition identified here is claimed to occupy the middle ground. This third tradition is Constructivism. Donald Cunningham and colleagues articulate such a position and illustrate, step

by step, how electronic media can be made to harmonize with it.

Of the other chapters in the book, three are focused on more particular features of psychoogical theorizing and how they inform the development of hypertext. So, Patricia Wright considers what can be learned from empirical research on reading. Then the editors themselves have written a chapter locating 'navigation' as a general topic within Psychology - and, of course, relating this to thinking about hypertext development. Finally, David Jonassen reports some studies exploring the effects of making the semantic network of expert knowledge explicitly available in the linking structures of a hypertext application, thus relating hypertext design to models of semantic memory.

There are two more chapters. Peter Whalley starts the book with a critical essay on the (liberation) rhetoric of hypertext, and Thomas Landauer and colleagues describe a series of elegant experiments that make up the formative development of their high-specification electronic book. Landauer's chapter gives the strongest sense of progress arising from research (it is also the longest piece - occupying a third of the book). But the chapter reminds us of an important distinction: electronic text for information retrieval versus for learning. These researchers are clearly working with the former: their 'SuperBook' is a technical manual for telephone engineers. The challenge of designing this kind of document seems more amenable to cognitive psychological research methods (and less dependent on highly articulated theory).

Most of the other authors in this volume are oriented towards creating tools for learning, and here progress seems more halting. In the end, I fear the truth may be that Psychology is not delivering the goods for this enterprise. For example, Wright feels obliged to conclude: 'Despite a century of work on the psychology of reading there is no theory of the reader that designers can employ to develop a usable hypertext document from first principles.' For me, this tends to expose Psychology as a rather narrow discipline. Here is a hint of it taken from within this book: studies described in one chapter are said to be 'concerned with the psychology of information access by humans.' 'Humans'? Well, this is a discipline over-anxious to affiliate with biology (and, of course, computer science). A discipline where people participating in research are often termed *S's*. In short, Psychology is curiously isolated from the culture of other social sciences - and not very interested in their progress. For problems defined in the present context, this probably matters. So, greater sensitivity to developments in literary theory, discourse analysis, ethnography or semiotics might enrich empirical research on some of the problems defined in this book (for example, the topical social science interest in 'narrative' rather passes Psychology by). Psychology is also a discipline fixated on one particular conceptual vocabulary for analysing cognition: dwelling on component processes manifest by de-contextualized actors - usually acting in the abstract settings of laboratories. So, for example, it is very rare in psychological literature on 'learning' to find reference to (or a presence in) the events of classrooms.

This is Cognitivism. Could the so-called middle ground of Constructivism then be an alternative way forward? I find the characterization of Cunningham *et al* here too sweeping; it blurs too many important distinctions (for instance, they say their position is 'variously labelled constructivism, experientialism, semiotics'). However, by any account, Constructivism remains a Cognitivist tradition, albeit one that has a welcome emphasis on studying activities

during the circumstances of learning. I believe there is an alternative theoretical perspective. Hammond flirts with it briefly in a section (also rather broad brush) on situated action and affordances. Alas, the editors chose to defuse this with the label 'new behaviorism'. Cunningham *et al* embrace it as socio-cultural theory, but it fails to surface on their landscape as a distinctive alternative.

A more socially grounded theory of mind might help in many ways. One would be in forcing us to take seriously the significance of context. If this volume captures representative 'psychological' research on hypertext (and I think it does), what is striking is a lack of concern for the broader settings in which these computer-based applications get used. Our understanding of this new medium will be impoverished until we take seriously both the interpretative practices that particular constituencies of users bring to it, and the broader framework of teaching and learning into which it gets variously located. I take Whalley to be raising these issues in a helpful way, and his is a chapter that I wish was longer.

Yet, this book is a balanced, accessible overview of recent research. I found it helpful in provoking new lines of thought on the subject in my own mind, and I am sure it will do so for many other readers, although not necessarily the same lines of thought!

Charles Crook, University of Durham

The Art and Science of Computer Animation by Stuart Mealing, Oxford, Intellect, 1992. ISBN: 1-871516-16-1.

Computer animation is the creation of the illusion of movement from discrete static images on a computer screen. It is an emerging discipline which embraces a wide range of subject areas, spanning both the arts and the sciences. There are many books available which deal with the mathematics, geometry and programming of computer graphics, while others deal with the traditional animation techniques used by the film industry, but there are very few which deal with the integrated subject of computer animation at any length. This book aims to fill that gap.

It is divided into two main parts. Part 1 covers the basic background material necessary to gain a full understanding of computer animation. The first chapter introduces traditional animation techniques in relation to the role of the computer, and the following chapters describe various applications of computer animation (from TV graphics to medical imaging), the basic principles of computer graphics and movement control, and various hardware and software considerations.

Part 2 builds on Part 1, describing in greater detail the latest developments in the area, including an attempt to predict the future applications of emergent technologies. The book concludes with detailed technical appendices, a glossary of terms and a bibliography. It is produced to a very high standard, attractively laid out with numerous effective illustrations.

In fact, this is certainly one of the most readable computing texts I have encountered. It well conveys the author's enthusiasm for his subject: clearly, computer animation should be fun, yet this does not make the book lightweight. What is most impressive is that all the necessary subject areas are dealt with comprehensively enough to make it an excellent starting point for those readers seriously considering undertaking a computer-animation project. Little prior knowledge of either mathematics or computing is assumed, making it possible for the more general reader to develop a broad understand-

ing of the field. And a comprehensive bibliography, combined with recommended texts, enables interested readers to make further inroads.

Most importantly, the author has concentrated on concepts and principles, rather than on supplying pages of mathematical formulae, or the ephemeral minutiae of proprietary hardware and software. This was a wise choice which will maximize the shelf-life of the book - an important consideration, with the rapidly increasing rate of technological advance. However, to provide balance, a case study, *The Making of Pencil Test*, from a paper by Galyn Susman of Apple Computer, is supplied in an appendix. This paper describes in detail the complete process of making a computer animation, and is particularly useful as it highlights the realistic day-to-day problems which must be dealt with during production.

While the book provides a great deal of useful information throughout, it is the material contained in Part 2 which makes it an essential read, since much of the material in Part 1 is available in a range of other texts (though this is not a criticism). In Part 2, I would single out Chapters 9 to 12 as being of particular merit. These are effectively state-of-the-art reviews of the areas of simulation, soft modelling, behavioural animation and the simulation of human movement: information which is not readily available elsewhere.

In all, I can confidently recommend this book to students, industry professionals, and any enthusiasts who wish to learn about computer animation.

Lorraine Warren, University of Hull

Instant Multimedia for Windows 3.1 by Kris Jamsa, New York, John Wiley and Sons, 1993. ISBN: 0-471-58972-1.

The use of computer systems for the generation and delivery of multimedia resources (text, sound, static pictures, animation and motion video) is growing rapidly. The ease with which these activities can be undertaken is also rapidly increasing. This is due mainly to the advent of the MPC (Multimedia Personal Computer) and the general availability and popularity of graphical user interfaces. This book is timely in that it provides a technical (and very readable) introduction to multimedia generation and applications using Windows version 3.1. It also offers hands-on use of a PC, since it comes with two floppy disks containing a range of multimedia material linked to various chapters.

There are 23 chapters. Some of them are very short but all are to the point. Together, they cover most of the important aspects of multimedia deliverable on a PC, although certain topics (such as digital full-motion video) are not treated in any great depth. There are also two appendices and a detailed subject index, but unfortunately there is no bibliography; nor does the author makes any reference whatosever to other sources of information, not even a Windows 3.1 manual!

The book is organized into four broad sections. The first (chapters 1 to 10) deals primarily with the creation and use of sound. The second (chapters 11 to 14) treats CD-ROM and its applications, the MPC standard, and more advanced uses of sound. The third (chapters 15 to 20) deals with fonts, scanners, video and animation. The final section (chapters 21 to 23) covers a range of topics including future possibilities and applications.

The first two chapters serve to introduce simple sound effects (based on the MPC's internal speaker) using the driver and digital sound files provided on the companion disks. Chapter 3 covers multimedia screen savers, while Chapter 4 (being slightly more 'academic' in that it deals with the physics of sound) brings out the relationship between sound quality, storage requirements and digitization parameters. Chapter 5 introduces a program called *Excuses* which uses the digital sound effects provided on one of the companion disks in a variety of interesting ways, and Chapter 6 gives the reader the task of experimenting with the speaker driver by exploring various customization parameters and the ways in which they effect sound quality. Chapter 7 introduces another program called *Presidents* which offers multimedia information about some of the presidents of the United States. It is possible to explore a textual biography, listen to a quotation and view a photograph of any of the seven presidents included in the demonstration.

Chapter 8 introduces the MPC standard by describing the basic configuration required to support it and the facilities it should offer (such as a sound board and a CD-ROM drive). The 'Ultimedia' (IBM's MPC rendering based on a PS/2) is also mentioned. Sound boards are treated in greater depth, however, in Chapter 9 (here, the material on IRQs and DMA transfers is quite useful), while Chapter 10 deals with how to use a board to record and mix sound using the Windows Sound Recorder accessory. Further material on sound effects is presented in the two subsequent chapters, the first of which describes the Windows Media Player, MCI (Media Control Interface) and the control of external devices such as CD-ROM drives, videodiscs, and so on, while the second describes the purpose and use of MIDI (Musical Instrument Digital Interface).

In Chapter 11 the author introduces some basic material on CD-ROM drives and their associated optical discs. This is followed in Chapter 12 by a fairly detailed description of the various multimedia and hypermedia electronic books that make up the Microsoft Bookshelf CD for Windows (*The American Heritage Dictionary*, *Bartlett's Familiar Quotations*, *The Concise Columbia Dictionary of Quotations*, *The Concise Columbia Encyclopedia*, *Hammond's Atlas*, *Roget's Electronic Thesaurus*, and *The World Almanac and Book of Facts*). Further examples of multimedia CD books are described in Chapter 22.

The visual mode of communication is considered in more detail in chapters 15 to 20. These cover a wide range of topics such as fonts (vector, raster and outline) and their use in both textual and multimedia documents (created by Write and Paintbrush), scanners and their applications (for creating image collections and OCR work), digital electronic cameras, and the use of bit-map images as wallpaper for use in Windows screens. The 'theory' of video is covered somewhat superficially in Chapter 18, while the next two chapters treat animation. Some examples of animation and video clips from the companion discs are used to illustrate the kind of thing that can be done with an animation package - in this case, Autodesk Animator.

The last three chapters deal with future possibilities (such as virtual reality, new ways of publishing information in multimedia documents, and the potential utility of multimedia techniques in education). Chapter 22 gives a very useful overview of a number of currently available multimedia CD publications such as *Multimedia Beethoven*, *Survey of Western Art* (which contains over 1,000 images and 300 biographies), *Sherlock Holmes, Consulting Detective* (which embeds

motion video), *Time Table of History, Science and Innovation, Mammals - a Multimedia Encyclopedia, Compton's Multimedia Encyclopedia,* and various hypertextual CD applications such as *Ebert's Movie Home Companion.* The final chapter describes some of the ways in which sound effects can be incorporated into other Windows applications such as spreadsheets, memos, electronic mail and applications programs using the Windows OLE (Object Linking and Embedding) facility.

What one has here is therefore a good overall introduction to the topic of multimedia. The material is sometimes of a technical nature, but the book itself is written in a way which makes that material understandable even to the novice. In fact, it should provide a helpful exposure for readers who are coming at this topic for the first time, and who require a guided exploratory approach to multimedia.

Philip Barker, University of Teesside

Producing Teaching Materials: a Handbook for Teachers and Trainers by Henry Ellington and Phil Race, 2nd Edition, London, Kogan Page, 1993. ISBN: 0-7494-0393-4.

Neither of the reviewers of this book was familiar with the first edition. That was no disadvantage - books should be current, update or not. As the authors recognize in their introduction, preparing a second edition raises the vexatious question of what to leave out from the first, published in 1985. Since then, document preparation and the production of teaching materials has undergone a technological revolution at all levels of education and training, and is still running. There are signs that the baggage from the last decade has slowed the authors down in their attempts to keep up.

In most areas there is an admirable linkage between the technology and the learning objectives. A good example is the section of Chapter 2 on printed materials which deals head-on with the current interest in open and flexible learning, provides definitions, and asks the pertinent questions anyone considering a venture in this area should be able to answer. As is appropriate for what is still the most widely used medium, print is covered in some detail. But do we still need to know how a stencil duplicator or even off-set litho work?

Chapter 3 discusses the use of non-projected display materials, posters, flipcharts, and magnetic boards. It includes a section on how a chalkboard should and should not be used. We are not sure which concerns us most; that this section should be in the book at all, or that teachers at all levels in education actually need the instruction. The production of still projected display materials is detailed in Chapter 4 with some excellent reference data on layout of OHTs and 35 mm slides. There is also a useful discussion on the management of a library of these materials.

Production of audio materials is looked at in some depth in Chapter 5. The section on design and management of the materials is practical and to the point, though some of the technical aspects as presented would serve to confuse and frighten off certain teachers who might be considering the use of this medium. It was delightful, however, to see Chapter 6 given over to the production of tape-slide material, which provides an effective linking of the techniques discussed in the preceding chapters.

Video technology is dealt with only three-quarters of the way through the book in Chapter 7, which might be an appropriate allocation of space for those working in primary and secondary education, whose funds are tightly constrained. For further and

higher education, however, with many institutions now providing audiovisual services centrally, the teachers might feel short-changed.

With millions being spent on the Teaching and Learning Technology Programme, Chapter 8's 30 pages on the role of computers in the classroom is miserly, given the multitude of applications. Many of the photographs in this section already look dated, and in some cases risible, such as those on two pages where essentially the same configuration is first captioned as a multimedia workstation and then as being used for computer conferencing. With computer technology advancing so fast in the time it takes to read a book, let alone in the time it takes to write one, the authors clearly had difficulties. The book has thus tended to concentrate on the principles and concepts of using computers in different teaching and learning situations. It looks at some concepts like multimedia and authoring languages, and at some of the new technologies, including CD-I and electronic books. The chapter, and book, ends with a couple of case studies. Somewhere along the way, the balance between the treatment of the old and new technologies has gone astray. The outcome is a book whose primary use would be as a student reference to how things used to be.

Mike Kibby and Stephen Welsh, University of Strathclyde

Interactive Multimedia - Promise and Pitfalls, edited by Colin Latchem, John Williamson and Lexie Henderson-Lancett, Kogan Page, London, 1993. ISBN: 0-7494-0815-4.

Virtually all forms of learning depend on effective communication. Multimedia approaches to knowledge transfer are attractive because the limitations and inadequacies of one channel of communication can usually be compensated for by the advantages of another. Also, introducing interactivity into communication mechanisms gives the recipient of a message considerable control over the nature of the information received and how it is presented. For reasons such as these, interactive multimedia would seem to offer significant potential for the design and implementation of effective and efficient communication mechanisms. This book explores some of the possibilities, and describes some current approaches to using interactive multimedia in an educational setting.

The book was originally conceived as a result of an international conference held in January 1992 in Perth, Western Australia, and several of the papers presented at this conference are included, along with others that have been specially commissioned. There are 12 chapters, produced by an international group of authors from Australia, Canada, The Netherlands, the UK and the USA. All are well-written, and each contains a useful list of references. A glossary, author index and subject index are also provided.

The opening chapter, written by the editors, gives an overview of interactive multimedia, outlining its basic nature and discussing the role of instructional design and the problems of introducing new technologies into learning environments.

This is followed by a chapter by Nigel Paine and Philip McAra which is mainly technical. It offers a summary of current developments in interactive multimedia, such as authoring systems, MPC, AVI, CD-ROM, DVI, CD-I, CD-ROM XA, Photo CD, interactive video and virtual reality.

In Chapter 3, Alexander Romiszowski discusses the problems of developing interactive multimedia courseware and communication

networks to support teaching and learning. In doing so, he raises a number of relevant design issues, such as the dichotomy between the instructional and informational roles that interactive multimedia can play.

Chapter 4 (by Thomas Reeves) discusses the current lack of research foundations to support the use of interactive multimedia, then goes on to describe some possible directions of future development based on constructivism, exploratory case studies and computer modelling.

In Chapter 5, Stephen Heppell outlines the historical development of educational computing in terms of four overlapping stages, then discusses some of the changes needed to make it more pedagogically effective. Some interesting illustrations taken from the *Xploratorium* are presented.

Peter Olaf Looms continues the educational theme in Chapter 6 by dealing with the use of interactive multimedia at the schools level, describing the current state of the art in both North America and Europe, and concluding by discussing some obstacles that need to be overcome before interactive multimedia will become widely used in schools and colleges.

In Chapter 7, Jenny Preece describes multimedia and hypermedia and their potential for the support of interactive learning, giving special consideration to human factors issues.

The contribution by William Tan and Ann Nguyan (Chapter 8) treats lifecycle costing models for interactive multimedia systems, then compares the cost-effectiveness of three different approaches to providing computer-based instruction with conventional instructor-led classroom presentations. Although the costings used relate to Australian experience, the models would be generally applicable to other situations and the same is to some extent true for Chapters 9 and 10, where two interesting Australian projects are described. Lyn Henderson outlines the difficulties involved in overcoming cultural problems using interactive multimedia methods (based on Macintosh computers) within a remote-area teacher education programme (RATEP) in North Queensland. In Chapter 10, Ian Conboy deals with the use of audiographic telematics in schools in order to improve retention rates. This project (called *MAX*) uses Macintosh computers, fax transmission and audio-conferencing methods in order to create an 'electronic classroom' made up from participating groups distributed geographically throughout the state of Victoria.

The last two chapters (11 and 12) deal respectively with interactive multimedia in libraries, and the creation of information products based on electronic publishing. In Chapter 11, John Frylinck and David Raitt review current technology, its potential roles in libraries, and ways in which libraries may have to adapt in order to accommodate interactive multimedia products such as electronic books and multimedia encyclopedias. The final chapter by Eric Lugtigheid describes a forward-looking Canadian venture called the *Jean Talon Project*, intended to produce a range of multimedia educational products dealing with various aspects of Canada: its political system, cultures, scientific achievements, geography, and so on.

I found this book readable and extremely interesting. Although some parts of it have a necessarily technical orientation, on the whole most of it deals with conceptual issues involved in using interactive multimedia within educational and training settings. Taken together, the chapters form a well-balanced whole, adequately reflecting the current state of the art in interactive multimedia from an educational perspective.

Philip Barker, University of Teesside