Preface

THE ORIGIN OF THIS BOOK

The idea for Digital Imagery and Informational Graphics in E-Learning: Maximizing Visual Technologies originated with my work as an instructional designer. On a daily basis, I work with faculty members striving to create effective online learning experiences. These professors hail from a range of fields. While they bring intense expertise to their own respective areas of expertise, many also bring with them traditions in higher education. It is said that higher education is often a verbal environment—both oral and textual, and it’s less visual. This tendency has carried over to e-learning. Yet, the contemporary installed-base generations of learners were raised on multimedia, digital immersiveness, and high-tech. These are people who connect through sophisticated wifi mobile communications devices. Visual thinking has become second nature for many; textual readings have receded in popularity. Digital imagery is a nexus for information, aesthetics, technology, and pedagogical design; it is ubiquitous. Its language may not be so clear to those teaching via e-learning. Words may be imagistic in a semantic way, but digital imagery embodies and communicates visual concepts directly.

Recent research includes rich findings about the human mind and visual cognition and learning—in relation to multimedia. Cognitive research has surfaced deep insights about how people perceive and use visual imagery. This research combined with pedagogical research enables visuals to more effectively introduce concepts, combine complex data streams into coherent information, and convey mental models and simulations. In situations of real-time decision-making which integrate large flows of information, dynamic digital visuals far surpass traditional images in capturing and conveying information and meaning.

E-learning deploys designed imagery for content, display, organization, interaction, branding, and navigation. Imagery allows for multiple ways of conveying information and telling a story. There are ways to create learning that has stronger retention. Informational visualization strengthens information extraction through “visual data mining” and exploratory data analysis. Images can be highly nuanced, information-full, and culturally bound; they may bridge cultural differences and maintain valuable understandings through time.

The educational technologies enabling e-learning have made it much simpler to integrate visuals and digital graphics into the learning flow. Using these technologies appropriately will involve a larger awareness of the image context for learning and also the techniques behind the uses of such technologies. While many superb graphic artists design various visuals, many non-experts have long had their hand in creating effective visuals for learning, regardless of their métier. “Those who discover an explanation are often those who construct its representation,” observes Edward R. Tufte in Visual Explanations: Images and Quantities, Evidence and Narrative.
At the same time, the technologists in the field have enabled sophistication in creating and deploying digital imagery, which may be singular-dimensional all the way to 3D and 4D. Higher Net bandwidth has delivered ever more complex imagery, including live-rendered and multi-stream visuals. Authoring tools enable technologists and designers to actualize images for electronic and Web delivery. These artifacts are more expressive and more usable. Hardware and software advancements enable the capture, editing and publishing of rich-sensory visual data.

Digital imagery rarely exists independent of multimedia—with integrated sound and text. In higher education, it is usually integrated into an overall e-learning path. That said, there are still benefits in analyzing digital imagery as one part of the e-learning experience and as a separate facet of instructional building and design. Educators and trainers would do well to know about these changes in order to enhance their teaching and learning work.

THE COMPOSITION OF THIS BOOK

e-learning. Chapter 2, “Visual Literacy in E-Learning Instructional Design,” engages concepts of visual literacy in this Digital Age, in order to help viewers understand visual information and intended (and unintended) effects. This chapter also shows the importance of accessibility in visual literacy.

The next section, “Digital Graphics in E-Learning,” examines the practical application of graphics in online learning with the following chapters: Chapter 3, “The Applied Role of Graphics in E-Learning,” and Chapter 4, “Types of Graphics in E-Learning.” Chapter 3 deals with how graphics are currently used in e-learning. Chapter 4 introduces the wide range of digital graphics types.

The heart of this text involves the section “Designing Graphics for E-Learning.” Within this are chapters that address visual design. Chapter 5, “Information and Visualization Imagery,” addresses the way information and imagery are created, including those with live data streams and sophisticated user builds. Chapter 6, “Capturing and Authoring Tools for Graphics in E-Learning,” highlights the functions that authoring tools enable for image captures and manipulations. Chapter 7, “Procedures for Creating Quality Imagery for E-Learning,” defines quality in digital imagery in pedagogical contexts and then offers practical ways to achieve this. Chapter 8, “Building Interactive and Immersive Imagery,” focuses on the creation of discovery learning, game and simulation spaces through digital imagery design. Chapter 9, “Collaborative Image Creation,” describes the work of both co-located and virtual teams in creating educational images through collaborations. Chapter 10, “Effectively Integrating Graphics into E-Learning,” examines strategies for integrating images—whether self-generated or inherited—into various learning situations for learning efficacy. Chapter 11, “The Storage and Access of E-Learning Visuals,” looks at the repositories and digital libraries of graphical images and multimedia resources. This chapter explores the ways these storehouses are populated with contents, how they are catalogued, searched, retrieved and deployed.

The next section is “Guiding Values in Digital Imagery,” and consists of two chapters. Chapter 12, “Designing Informational Graphics for a Global Multi-Cultural Context,” takes a globalist view of imagery and the nuanced meanings that may be extrapolated from various images and dynamic visual interactions. Chapter 13, “Applied Ethics for Digital Imagery,” provides a rich overview of ethical concerns and issues in the creation and deployment of digital imagery. This chapter offers some practical approaches to handling various ethical concerns.

The last section, “Looking Ahead to a Shimmering Digital Future,” projects the changes in technologies and pedagogical approaches for the uses of digital imagery in e-learning. Chapter 14, “Future Digital Imagery,” will coalesce the current research and practices in the educational and training uses of digital imagery and focus on the near-term future.

READERS OF THIS WORK

The readers of this work may be faculty and staff supporting e-learning. Technologists and instructional designers may find the text helpful, in their anticipation of the functionalities that are in research and development currently and also in maximizing existing digital imagery authoring tools and resources. Graduate students may also find this text informative for their work and studies. Knowing how to engage the e-learning technologies may enhance the creation of teaching and learning experiences online.
THE RESEARCH AND WRITING APPROACH

This text is presented as a part-handbook part-survey text, within the framework of building contents for higher educational e-learning. This was written in a general way so as to bridge many knowledge domains. The emphasis has been on practical approaches to enhance online learning and training, with the pedagogical theories as a backdrop. An assumption is that faculty and staff (technologists and instructional designers, in particular) work in a do-it-yourself (DIY) sphere as a daily reality. Continuing economic pressures have encouraged universities, colleges, departments, and programs to build their own in-house capacity to create and use digital imagery strategically for learning.

There are other texts that engage issues of multimedia design theories, specific applications of digital mediums for education, how-to books on various capturing devices and authoring tools, and theoretical works on e-learning. This book will not pursue these various lines of inquiry to the utmost. Rather, this will provide a primer approach to the complex issues of digital imagery use in e-learning with a practical and applied approach.

Purposive design effects are preferable to accidental ones, and this knowledge may empower educational practitioners. It is hoped that this text will help start more widespread academic discussions and experimentation in this area. While discussions in this area and field can get fairly complex fairly quickly, the focus here was to keep the discussions simple albeit without misrepresenting the larger complexities. A special effort was made to avoid citing software products and entities by name. Also, unique terminology from special domain fields relating to digital visuals was avoided, and a conscious effort was made to use the most widely used terminology in the most understandable way. That was in part due to the fast-changing resources in this field. Another reason is to protect the text’s longevity.

Many websites could be cited as exemplars for this text. However, with the widespread flux of sites and ever-changing technologies, readers would be better served with a more solid information foundation and the encouragement to seek resources that have relevance to their particular interests and work. The affordances of the Internet and World Wide Web (WWW) are growing exponentially, and I trust that users will have the savvy to explore their interests and fulfill their digital graphics needs.

Another related caveat refers to the digital imagery in this text. The images here are necessarily 2D and 3D delivered via a 2D black-and-white paper surface, given the limited affordances of a paper book (even though it does have an electronic doppelganger). Intellectual property constraints also limited the showing of various imageries to those available by copyright release or in the public domain. I bring up these limits to encourage readers to go online to experience the digital imageries described in this text.

It is hoped that this text will be helpful to users who work in a complex and dynamic instructional design and digital e-learning environment. Suffice it to say that one doesn’t know what one doesn’t know about a topic at the beginning of writing a book, and now, a year later, I am a little better informed. However, it would be incautious to suggest that this is anything more than an opening salvo in this field.

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