Chapter 3
The Applied Roles of Graphics in E–Learning

ABSTRACT

In today’s modern and networked generation, sophisticated graphics are expected for learning. These digital graphics fulfill a number of learning purposes: to direct attention, to provide examples, to offer evidentiary proofs, to set a context, to introduce a personage or character, to offer an affective jolt to increase memory retention, to entertain, and others. Digital graphics work on both subconscious and conscious levels, and these effects will be examined. This chapter will enhance reader awareness of these rich and varied roles and potentially evoke a variety of creative graphical solutions.

CHAPTER OBJECTIVES

• Consider the applied roles of graphics in e-learning
• Introduce graphical user interface; visual branding; documentation and verification; human identity and social presence; explanations, exemplification, categorization, comparison and contrast; relationships, cause and effect, and causal analysis; processes; downloads and enablements; argumentation and persuasion; complex information visualizations over time; decision-making and problem-solving; the creation of an immersive virtual context; extension of the human imagination; augmented reality, mobile applications, and ambient intelligence, and user-generated imagery
• Enhance reader awareness of potential creative graphical solutions based on the roles of digital graphics in e-learning

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INTRODUCTION

Graphics and visuals fulfill numerous roles in e-learning, for both academic and work-place training purposes. In a general sense, these enhance the e-learning and keep it from being purely textual reading and writing. Images may supplement a curriculum. Still and dynamic images contribute to a full-sensory multi-media learning experience, enhanced by sound and interactivity. Visuals may make online learning more engaging and memorable. Visuals may be a centerpiece of the learning—the analysis, problem-solving and decision-making. Images may convey complex information.

A majority of visuals in e-learning work on the conscious levels but often go unnoticed by users who may be inattentive or untrained in looking at the graphics analytically. Digital images also promote different types of literacy: “statistical, graphic, cartographic and domain” literacy for youth (MacEachren, Harrower, Li, Howard, Downs & Gahegan, 2002). Visuals can enhance human imagination, and they can promote more accurate visualizations of particular phenomena.

This chapter will explore the various functions of digital imagery in e-learning and will offer examples of each type. One assumption is that there may be overlapping functions of the images, but that there are likely central guiding purposes. These will be organized in the order of the more simplistic, stand-alone images and then move to the more complex, immersive visuals. The organizing concept will be based around that of the main learning purposes of the images and their uses in the particular e-learning contexts. This involves consideration both of the motivations of the creators of the visual, the uses by the instructors, and the uses by the learners. Examples of each and some design implications for each will be considered.

Designing a Graphical User Interface

Graphical user interfaces (GUIs) create a context for users to interact with a computer. The GUI not only offers a context but particular depictions of functionalities that may be actualized via the interface. “The user interface is one of the most important parts as all interaction is done using it, and therefore it must be intuitive, understandable, easy to use, and all functionality needed by the user must be accessible with it” (Kamsin, 2007, para. 20). These design structures help users navigate visually cluttered Web pages for easier accessibility (Lee, 2004). Interfaces may be tangible ones such as touch-screen (van den Hoven, Frens, Aliakseyeu, Martens, Overbeeke, & Peters, 2007).

Types of Devices

Visuals may enhance user understandings of how to use a particular online tool. These include cyber dashboards that emulate equipment or machines, such as cockpit software support systems (Williams, 1988) and biofeedback systems. User interfaces may include those for tabletop groupware systems, which integrate computing with real-world work surfaces. A whole body of research tracks how to design such interfaces for illiterate and semi-literate computer users (Medhi, Prasad, & Toyama, 2007).

These may be user interface designs for software programs like learning / course management systems (L/CMSes). GUIs are designed also as portals to data repositories. For smaller hand-held mobile devices, the user interfaces have to be even more creative for effective use given the small screen displays, limited available colors, relatively limited resolutions and limited processing power (Paekle, Reimann & Rosenbach, 2003).