

## Chapter 8

# A Possible “Catalytic” Effect of Multimedia Learning Content

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### **EXECUTIVE SUMMARY**

*Good design is critical for the success of e-learning tutorials and previous research has yielded various principles to guide practitioners. While the evidence for these are generally coherent, there are occasional exceptions and inconsistencies that cannot always be fully explained. One possible cause was thought to be a ‘seductive’ effect of some content; however, further research into this revealed its own microclimate of discrepancies. A new perspective—catalytic content—is presented here and this is described as material that is important, not because of its direct relevance to the learning outcomes, but because it supports the process of learning the material that is directly relevant.*

### **SETTING THE STAGE**

For almost as long as we have had computer based learning and e-learning, so too have there been low cost, ‘*no programming skills required*’ authoring tools. These have allowed all manner of well-intentioned enthusiasts to develop material of quite variable quality and effectiveness. In the early days, there was almost a pioneering spirit that meant some instances of poor quality did not necessarily hamper adoption

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but, as Najjar’s (1996) analysis of nearly 40 studies comparing multimedia with classroom lectures concluded, early successes may often have been due more to the relative novelty of this new medium than effective design.

Those novelty days are now long gone and e-learning is an accepted component (and sometimes the sole medium) of many university and vocational courses. Indeed, there is a growing number of ‘digital natives’ (Prensky, 2001) who simply can’t imagine life *without* a computer, the Internet, social networking, games consoles, and mobile phones. This was evidenced by an Organization for Economic Co-operation and Development (OECD) survey (2010) which found that, “...less than 1% of 15-year-old students in [the 30] OECD countries declared that they had never used a computer” (p. 12).

Users and commissioners of e-learning are now much more experienced and astute; they rightly demand materials that are well designed in order to deliver solutions that are clear, relevant, engaging, and effective. This chapter begins by describing some of the research into the pedagogic design of e-learning tutorial content (i.e. e-learning that is didactic and probably stand-alone in nature, as opposed to other forms of e-learning that might provide access to information, other resources or online activities). Research outcomes and some potential shortcomings are discussed before a new principle, catalytic content, is discussed, together with some supporting theory and details of an experiment that was conducted to test the principle.

## MULTIMEDIA DESIGN PRINCIPLES

There is no shortage of anecdotal evidence and folklore amongst practitioners about what makes good e-learning and there has been considerable research into various aspects of pedagogic design. One name that frequently crops up in the literature is that of Richard Mayer, most notably for devising a set of multimedia design principles (Mayer, 2001, 2005, 2009). Although there are a number of these (twelve in his 2009 book), five are most widely investigated and cited:

- **Multimedia principle:** People learn better from words and images than from words alone (Mayer, 2001; Fletcher & Tobias, 2005).
- **Modality principle:** Visual and auditory information is more effective than either visual or auditory alone (Mayer, 2001; Low & Sweller, 2005).
- **Contiguity (or split attention) principle:** Words and corresponding images should be presented spatially and temporally as closely as possible (Mayer, 2001; Ayres & Sweller, 2005).

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