

## Chapter 9

# Digital Media Affecting Society: Instruction and Learning

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### ABSTRACT

*The proliferation of the use of digital media for learning and instruction continues to be investigated and pondered as the advance of a broad range of technologies eclipses currently available traditional text and face-to-face learning modalities for K-12 and higher education instruction. Digital media's affect on educational processes and delivery, an analysis of existing research reviewing whether digital media is benefitting educational outcomes in instruction and learning, and recommendations for the future are the primary goals of this chapter. Investigation into each of the aforementioned topics separately reveals an intersection that is far from being maturely assessed. The topic of digital media affecting how people learn will elicit further research as education continues to call for an increased focus on high outcomes while also increasing the adoption of digital media resources for the transmission and acquisition of knowledge.*

### INTRODUCTION

The proliferation of the use of digital media resources in the field of education continues to be investigated and pondered as the advance of a broad range of technologies eclipses currently available traditional text and face-to-face learning modalities for K-12 and higher education instruction in the public and private spheres. Digital media's effect on educational processes and delivery, an analysis of existing research reviewing whether digital media is benefitting educational outcomes in instruction and learning, and recommendations

for the future are the primary goals of this chapter. Investigation into each of the aforementioned topics separately reveals an intersection that is far from being maturely assessed. Adoption of digital media for instruction is rising, and is predicted to grow indefinitely. The topic of digital media affecting how people learn will elicit further research as education continues to call for an increased focus on high outcomes while also increasing the adoption of multimedia resources for the transmission and acquisition of knowledge. Implications for the future are mixed with hope for positive progress, and suspicion that digital

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media will make all areas of education less of an engaging enterprise and more of a commodity to be consumed.

The creation of instructional digital media by learners, not just its consumption, is another aspect of sweeping change throughout society that deserves investigation. Learners of all types continually create evidence of their learning outcomes in the form of media—papers, projects, presentations, and group reports. Written, text-based, forms of communication no longer hold the appeal they once had in a world filled with digital media. Students can (and often do) create digital video at the push of a button on a daily basis. They learn visual literacy techniques that increase their abilities to create info graphics and web pages that combine multiple elements of digital media together in the hopes of generating more engagement by audiences of all types. Teachers and professors alike are beginning to understand that communication through the written word is no longer the only essential skill to instill in their learners. The ability to work well with digital media software and hardware is increasingly becoming undebatable as an essential learning outcome.

Finally, some researchers make the assertion that digital media does not affect essential outcomes like reading, writing, mathematics, critical thinking (CT), problem-solving abilities (PSA) and other types of learning goals set in schools at any level. It can be argued that if digital media produce similar learning results in comparison to other forms of media, then the best choice for instructors is the cheapest and most-easily-acquired form of media available. Professor Anthony Grafton of Princeton University explains that all aspects of any medium's elements, including art and binding (as with plain text sources), create an environment that affects knowledge consumption and cognitive processing abilities (Prpick, Redel, & Grafton, 2011). For some, it is not safe to assume that digital media bears any different affect on users than a non-digital form of the same mate-

rial. For others, there is certainly an effect to be observed throughout society by the wide spread use of digital media. Mayer and Moreno (2003) propose that individuals process pictorial and verbal information differently in their minds, thereby establishing digital media's affect on the mind as something separate from text-based materials. The problem of cognitive overload can stifle learning, the researchers explain, as more information can be presented through digital media than can be presented through text-based materials. In the context of instruction and learning, is access and consumption of digital media (with its ability to present many different types of information to a consumer all at once) ultimately a negative or positive effect of the influence of technology throughout the greater society? Strategic planning and focused utilization may be the best way to integrate digital media in the educational arena in order to maximize positive effects.

## **BACKGROUND**

### **Digital Media, Cognitive Load, and Cognitive Learning Theory**

Cognitive theories related to the effects of digital and multimedia on learning and instruction include research into the visual and verbal channels for information processing and knowledge acquisition combined with the argument that these two channels are not unlimited in their abilities to gauge phenomena and cause heavy loads to weigh on cognition (Mayer & Moreno, 1998b). These cognitive load theories include three types of memory stores: (a) sensory memory, (b) working (sometimes called short-term) memory, and (c) long-term memory. Sensory memory captures the text and visuals in their most exact form, as well as auditory sounds, for a very limited amount of time. Working memory takes the sensory memory and allows for manipulation where the raw material from the sensory memory can be made into a

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