# Chapter 4
# I See Therefore I Think:
## A Cognitive Perspective on Learning How to Write Through Visual Media

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## ABSTRACT

*This chapter uses cognitive theory of information processing to demonstrate the role of visual learning in the context of reading and writing. According to the theory, individuals do not take a singular approach to processing information. Rather, they experience the world through visual and verbal channels. Information is then organized by working memory into more comprehensive models—the visuo-spatial sketchpad and the phonological loop. The author considers pedagogical strategies for writing instruction that rely on the multimedia principle, which states that our minds work best when learning combines the visual with the aural. The specific mission of the chapter is to show how the multimedia principle can benefit writing instruction in three different contexts: 1) reading and writing comprehension, 2) narrative writing, and 3) grammar usage. The chapter concludes with the suggestion that learning through images is not just a cultural phenomenon, but also a scientific one.*

## INTRODUCTION

Traditionally, learning to read and write has been categorized as exclusively "verbal" exercises. Even standardized tests such as the SATs and the GRE classify the writing portions of their exams as "verbal." Over the past couple decades, however, communication in Western society, including written prose, has become increasingly visual (David, 1998; Smith & Elifson, 1986). Social media inundates readers with pictures. Advertisers sell products with a single graphic. News stories are told with dramatic photography. Garoian and Gaudelius (2008) argue that images "teach us what and how to see and think and, in doing so, they mediate the ways in which we interact with one another as social beings" (p. 2). The following chapter examines the psychology behind learning what and how to see and think through images while paying special attention to the role played by writing instruction. Rather than taking an either/or approach

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of arguing for the inclusion of images in pedagogical designs at the expense of verbal elements, the author shows how imagery enhances the learning process. To support such a claim, the author relies on cognitive theory of information processing. According to the theory, individuals do not take a singular approach to processing information. Rather, individuals' minds receive stimuli simultaneously and then process the information into visual or aural channels.

The mission of the chapter is to show how multimedia learning can specifically benefit writing instruction in three different contexts: 1) reading and writing comprehension, 2) narrative writing, and 3) grammar usage. For the first context, the author cites a review of three decade's worth of research on pictorial representations of text (Carney & Levin, 2002). The literature consistently shows that students are better able to comprehend printed or spoken text when they are able to construct their own visuals of the text.

For the second context, a consideration of Finley and Dunn's (2010) Thirsty Thinker's project, which used visual arts to promote narrative writing skills in children, is made. As part of Finley's At Home At School program, the Thirsty Thinker's project bypassed the extraneous cognitive load experienced by students who attempt to go straight from idea to text. Obstacles such as spelling, syntax, grammar, and organization were mediated when students first represented their ideas using visual imagery. The images helped to scaffold the writing process by first organizing students' concepts of their stories and then serving as a reference point when students transitioned into drafting phases.

Finally, for the third context, the author provides an ongoing project called "Grammar Co-mix," a database of grammar-related images designed to aid students learning basic writing skills. While Grammar Co-mix can potentially benefit students with low prior writing knowledge in a variety of situations, the program is currently being used in a writing center setting. In either one-on-one sessions or in small group tutorials, tutors can reference an image retrieved from the database while guiding students in the usage of grammar rules.

The conclusion of the chapter asks teachers to rethink traditional pedagogy, which has often focused exclusively on aural or text based presentations of information. Because visual learning is as much a scientific phenomenon as it is a cultural one (Garoian & Gaudelias, 2008), it is crucial to understand how the ubiquity of images shapes students' minds and determines their memories.

## COGNITIVE THEORY OF INFORMATION PROCESSING

Cognitive scientists have been researching the effects visual learning has on our minds for more than fifty years. Grounded in empirical work, these researchers have constructed frameworks and theories that help explain how visual and verbal presentations are responsible for structuring the mental schema that learners form to make sense of the world. For the present chapter, a useful starting point is Paivio's (1991) review of the foundational claims that imagery is a powerful boon to cognition and memory.

Central to Paivio's review is an evaluation of his Dual-Coding Theory (DCT), which assumes a contrast between symbolic systems of thought and sensorimotor systems of experience. According to DCT, rather than individuals simply recording experiences exactly as they occur, "verbal and nonverbal systems symbolically represent the structural and functional properties of language and the nonlinguistic world, respectively" (Paivio, 1991, p. 257). Because individuals experience the world via multiple senses functioning simultaneously, internal symbolic systems retain the distinctions and "code" experiences