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## A picture is worth a thousand words (at least): The effective use of visuals in the economics classroom

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### ABSTRACT

Much attention has been devoted to improving teaching pedagogy in economics; yet, one area that has generally lagged is the effective use of visuals. Evidence from cognitive and brain science suggests that the common approach of placing text onto slides does not improve student retention. This paper ties the literature from cognitive and brain science with that of economic education to show how visuals are more complementary to spoken lectures than words. This, in turn, leads to improved learning outcomes and a more enjoyable learning experience. The paper concludes with a concise summary of best practices, emphasizing easy-to-implement design techniques.

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## 1. Introduction

One of the most significant changes in education over the last two decades is the transformation of the classroom lecture, from a “chalk-and-talk” format that has existed for centuries to an active learning approach. One technology that has revolutionized this change is presentation software such as PowerPoint and its equivalents, which has allowed the chalkboard (a static medium conveying

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words and basic visuals) to be replaced with a dynamic medium, allowing for multiple visuals including words, pictures, audio, video, animation, and video.

Advances in technology can dramatically improve the efficiency of the learning process, as information is conveyed more easily through a verbal and visual channel, a process by which cognitive and brain science has shown to improve understanding and retention. This literature has subsequently been studied and adapted to the education literature, which has shown that the effective use of visuals can result in improved learning outcomes in the classroom.

It is therefore surprising that in practice, the use of visuals in the economics classroom has been at best loosely embraced. Visuals in economics have longed focused on graphs and less on other forms of visuals, such as photographs and animations, which complement the ability to convey analytical concepts common within the discipline. Anecdotally, there has been a slow acceptance in the use of non-graphical visuals in the economics classroom. Evidence includes publisher-provided PowerPoint slides that commonly consist of bullet points as opposed to more dynamic forms of visuals. Further anecdotal evidence is seen at research-focused economics conferences, where “pictures” are rarely used in research presentations.

The disconnect between the cognitive and brain science research on visuals and actual practice in the economics classroom makes this an important topic for two key reasons. First, technologies allowing instructors to incorporate more visuals into the learning process have not been effectively exploited. And second, less obvious but equally important, is that today’s college students, mostly born after the Internet revolution, are very accustomed to visuals and multimedia.

The purpose of this paper is to summarize the contributions of the cognitive and brain science research and how it ties to the literature on economic education. We then adapt these methods into a discussion of best practices for instructors to incorporate visual techniques easily and effectively into classroom presentations.

The remainder of the paper is as follows: Section 2 presents the case for visual presentations by summarizing research in cognitive and brain science. Section 3 highlights the research on visuals and presentation software in economic education. Section 4 summarizes the literature by presenting the key principles when using visuals in the classroom. Section 5 presents best practices in creating classroom visuals within the economics discipline, and Section 6 concludes.

## 2. The case for visual presentations

For centuries, the dominant form of presenting instructional messages has been words: read in books, spoken in lectures, and written on blackboards. Verbal modes of presentation have dominated the way we explain concepts to others, and therefore, how educators teach. The introduction of the personal computer had the potential to question the conventional wisdom of using words to transmit educational messages. Nevertheless, the initial effort was not to use this technology to question the supremacy of words, but rather to reinforce it by applying the same model to the new medium.

The consequence of this is PowerPoint presentations used every day in the classroom that simply fill slide after slide with the same words that used to appear in books and on the blackboard, rather than imagining new ways to present information. As a result, this new medium of conveying knowledge to students has generally not improved the effectiveness of teaching, making some question the role of technology as a catalyst for positive change in education.

Within the economics discipline, visual imagery in the form of graphs and charts has historically formed the backbone of the subject. With multimedia, these images can be expanded to pictures, video, and animation. Yet, some instructors believe that pictures merely add “fluff” to content, while others are unwilling to invest time and effort to develop dynamic visual content which is often perceived as more time-consuming to create than text-based content.

Although any presentation is inherently visual, since one must use eyes to see it, we define a “visual presentation” as one that relies mostly on pictures (e.g., photos, diagrams, animations, concept maps, etc.) instead of words to deliver its main educational message. With that distinction in mind, the goal of this section is to offer a rationale for visual presentations using decades of research in both cognitive and brain science with respect to two areas of our brain function: vision and memory. We then tie

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