Reducing Cognitive Load in Educational and Multimedia Learning Environments

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Multimedia learning environments are commonly used in teaching and learning. They have the potential in presenting the information in various formats. However, research studies found that the use of multimedia learning environments in teaching and learning is not always effective. They may impose heavy cognitive load on learners, which cause working memory overload and, therefore, hinder learning. This ineffectiveness may result from inappropriate design of multimedia instruction, which overloads working memory and results in ineffective learning. One of the reasons for this working memory overload is the split attention effect that occurs when learners need to mentally integrate two related sources of information at the same time in order for the learning materials to be understood. For example, one of the approaches of reducing split attention in multimedia learning environments is using visual cues (attention directing cues) to guide students’ attention as a try to reduce split attention and therefore enhance learning. The use of visual cues reduces visual search and thus reduces the cognitive load on students’ working memory. This poster presents different approaches to design multimedia learning environments in a way that reduces split attention. In addition, this poster will report the results of a research study that used three different types of visual cueing in multimedia instruction to found out which learning environment significantly reduced split attention measured by a mental effort scale. The participants of the study are pre-service teachers in one of the teacher training colleges. The participants were equally divided to three different treatment groups. The three groups were exposed to the same multimedia learning environments that vary only in the cueing strategy that was implemented. This study used Quasi- experimental design. Results indicated that using the cueing strategy that did not block the related content in the multimedia learning environment significantly reduced split attention comparing to the other different cues.

Keywords: Cognitive Load – Split Attention – Cueing – Signaling – Working Memory

Conflict of Interest
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**References**