World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:12, No:06, 2018

A Comparative Evaluation of Cognitive Load Management: Case Study of Postgraduate Business Students

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Abstract : In a world of information overload and work complexities, academics often struggle to create an online instructional environment enabling efficient and effective student learning. Research has established that students' learning styles are different, some learn faster when taught using audio and visual methods. Attributes like prior knowledge and mental effort affect their learning. 'Cognitive load theory', opines learners have limited processing capacity. Cognitive load depends on the learner's prior knowledge, the complexity of content and tasks, and instructional environment. Hence, the proper allocation of cognitive resources is critical for students' learning. Consequently, a lecturer needs to understand the limits and strengths of the human learning processes, various learning styles of students, and accommodate these requirements while designing online assessments. As acknowledged in the cognitive load theory literature, visual and auditory explanations of worked examples potentially lead to a reduction of cognitive load (effort) and increased facilitation of learning when compared to conventional sequential text problem solving. This will help learner to utilize both subcomponents of their working memory. Instructional design changes were introduced at the case site for the delivery of the postgraduate business subjects. To make effective use of auditory and visual modalities, video recorded lectures, and key concept webinars were delivered to students. Videos were prepared to free up student limited working memory from irrelevant mental effort as all elements in a visual screening can be viewed simultaneously, processed quickly, and facilitates greater psychological processing efficiency. Most case study students in the postgraduate programs are adults, working full-time at higher management levels, and studying part-time. Their learning style and needs are different from other tertiary students. The purpose of the audio and visual interventions was to lower the students cognitive load and provide an online environment supportive to their efficient learning. These changes were expected to impact the student's learning experience, their academic performance and retention favourably. This paper posits that these changes to instruction design facilitates students to integrate new knowledge into their long-term memory. A mixed methods case study methodology was used in this investigation. Primary data were collected from interviews and survey(s) of students and academics. Secondary data were collected from the organisation's databases and reports. Some evidence was found that the academic performance of students does improve when new instructional design changes are introduced although not statistically significant. However, the overall grade distribution of student's academic performance has changed and skewed higher which shows deeper understanding of the content. It was identified from feedback received from students that recorded webinars served as better learning aids than material with text alone, especially with more complex content. The recorded webinars on the subject content and assessments provides flexibility to students to access this material any time from repositories, many times, and this enhances students learning style. Visual and audio information enters student's working memory more effectively. Also as each assessment included the application of the concepts, conceptual knowledge interacted with the pre-existing schema in the long-term memory and lowered student's cognitive load.

Keywords : cognitive load theory, learning style, instructional environment, working memory
Conference Title : ICTLHE 2018 : International Conference on Teaching and Learning in Higher Education
Conference Location : Paris, France
Conference Dates : June 25-26, 2018