Effects of technology enhanced teaching on performance and cognitive load in calculus

ABSTRACT

Technology or computer-support learning allows more students to be actively thinking about information, making choices, and executing skills than is typical in teacher-centred learning. Moreover, when technology is used as a tool to support students in performing authentic tasks, the students are in the position of defining their goals, making design decisions, and evaluating their progress. The teacher's role changes as well. As students work on their technology-supported products, the teacher moves around the room, looking over shoulders, asking about the reasons for various design choices, and suggesting resources that might be used. This study aimed to investigate the cognitive factors enhanced with the integration of interactive software Autograph in comparison to the conventional way for teaching Calculus at the secondary level. A quasi-experimental research design was used for this study with three phases implemented: 1) Introductory lesson on use of Autograph, 2) Integrated collaborative learning in using Autograph software, 3) Students performance utilizing the Autograph software was found to be more superior significantly, $t\ (77) = 2.58$, $p < .05$ compared to the conventional learning mode. However, conventional learners showed low mental effort as compared to the Autograph learners. These findings suggested that in utilizing any technological tools, a comprehensive measures addressing issues of instructional efficiency is crucial especially when involving large scale implementation of technology integration in teaching and learning.

Keyword: Technology-enhanced learning; Mental load; Instructional efficiency; Autograph software