

Does prior knowledge reveal cognitive and metacognitive processes during learning with a hypermedia-learning system based on eye-tracking data?

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Abstract: Self-regulated learning (SRL) can be measured in different ways (e.g., eye-tracking) and can be impacted by individual differences (e.g., prior knowledge) as college students learn with MetaTutor, an intelligent hypermedia system. In this study (N = 30), we examined fixation and duration data on interface-related areas of interest (AOI)-pairs as indicators of cognitive and metacognitive SRL strategies, and whether the frequencies of fixations and proportion of time spent on these AOI-pairs differed between prior knowledge groups. Results indicated that high prior knowledge learners selected significantly more cognitive (e.g., summarize) SRL strategies than learners with low prior knowledge. Additionally, learners with low prior knowledge spent a significantly higher proportion of time engaging in help seeking behavior, compared to high prior knowledge learners. These results have implications for designing advanced learning technologies capable of detecting real-time eye-tracking data used to adapt to fluctuations in learners' SRL processes and foster effective learning.