Using Erroneous Worked-out Examples for Supporting Collaborative Learning: An Investigation Based on the Cognitive Model of Link Errors using ACT-R

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Abstract

Considering the effect of collaborative learning based on the Interactive-Constructive-Active-Passive (ICAP) theory, learners can deepen their understanding by engaging in interactive activities in which they elaborate their knowledge by integrating others' elaborated knowledge. However, it is unclear from the comparison between worked-out and erroneous worked-out examples whether they facilitate interactive and deepen understanding. Therefore, this study examines the effects of erroneous worked-out examples in collaborative learning. We employed a cognitive model based on Adaptive Control of Thought-Rational (ACT-R) to present concept map examples based on learners' relevant knowledge. Errors were adopted link error because links are important for understanding knowledge. The results showed that the worked-out example improved learning performance, but did not facilitate the collaborative learning process. Moreover, the erroneous worked-out example enhanced learning performance by facilitating interactive. These results provide insights into the effect of an erroneous worked-out example and a strategy for presenting it.

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