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Learner expertise and mathematics different order thinking skills in multimedia learning.

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Summary: This experimental study used an instructional visual aid for algebra to investigate whether different order thinking skills – remembering, understanding and analyzing – affect the expertise reversal effect. One hundred and twenty-three secondary school students were assigned to an experimental condition, either with or without the aid. In the experiment, an aid that was designed for novice learners, and the materials were developed using multimedia learning principles to maximize the use of learner cognitive capacity. The results showed that the expertise reversal effect occurred in understanding (retention, more-structured), but not in remembering (transfer, more-structured) and analyzing skills (transfer, less-structured). A plausible explanation is less-structured environments that require heavier process of searching and/or selecting increased demand of cognitive load imposed. We suggest that designing adaptive environments should take order thinking skill, instructional format and learner expertise into account.

Classification: C30 C40 U50

Keywords: learner expertise; multimedia learning; adaptive learning; mathematics

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