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Proceedings of the Annual Meeting of the Cognitive Science Society

Title
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Permalink
https://escholarship.org/uc/item/0c0774f2

Journal
Proceedings of the Annual Meeting of the Cognitive Science Society, 32(32)

ISSN
1069-7977

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Publication Date
2010

Peer reviewed

Using analogical learning in science curricula to improve conceptual understanding

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Abstract: The goal of the 21st Century Center for Research and Development in Cognition and Science Instruction (CaSE) is to improve middle school students' science learning by systematically applying cognitive science principles in the revision of instructional materials and teacher professional development. In this presentation we focus on the application of analogical learning principles to two popular middle school science curricula. Analogical learning through comparison is a powerful activity for facilitating the acquisition of critical features and concepts underlying concrete examples and preparing students for future learning. We instantiated these principles by creating "contrasting cases" to introduce abstract science concepts in conceptually driven lessons that could easily be inserted into existing curricula. We assessed the effectiveness of this intervention with tests targeting both the concepts that were covered in the cases as well as transfer concepts taught later in the curriculum. We will present preliminary data from pilot teachers.