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Understandings of solutions to differential equations through contexts, web-based simulations, and student discussion.

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As in the case of elementary mathematics, the instruction of high-level mathematical concepts can often be sacrificed at the expense of a focus on algorithmic procedures. Computer-based simulations can expand an undergraduate mathematics instructor's opportunity to explore high-level mathematical concepts in an applied environment. This study describes one instructor's approach to incorporating simulations and classroom discussions in a differential equations course and the subsequent effects on student learning attitudes and outcomes. Students made modest gains in the area of conceptualizing and applying ideas regarding solutions to differential equations in this learning environment. Implications of the study include the identification of specific gains relative to computer-mediated learning environments and recommendations for using simulations to support conceptual development. (author's abstract)

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