

Public Abstract

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Graduation Term:SP 2013

Department:Learning, Teaching and Curriculum

Degree:PhD

Title:The Influence of Pedagogical Content Knowledge (PCK) for Teaching Macroevolution on Student Outcomes in a General Education Biology Course

This study investigated the influence of specialized teacher knowledge for teaching macroevolution on non-science majors' knowledge of macroevolution and evolution acceptance. The study used a mixed methods approach to understand how the instructor's knowledge influenced student outcomes, and is one of the first to examine the influence of teacher specialized knowledge on student outcomes at the post-secondary level. In addition, the study is one of few to document a significant relationship between knowledge of evolution and evolution acceptance, including how instruction influenced these outcomes.

The instructor was found to have deep knowledge of learners, and this knowledge in turn informed the other components of her knowledge for teaching macroevolution. Her knowledge of learners was built through reflecting on student exam outcomes, referencing the teaching resource literature, interactions with students, and discussions with colleagues. These findings have implications for faculty professional development.

The influence of the course was examined both quantitatively and qualitatively. From pre- to post-test, students became significantly more accepting of evolution ($p < .0001$) and made significant gains in understanding macroevolution ($p < .0001$). Knowledge of macroevolution and evolution acceptance were also significantly correlated ($r[268]=.47, p<.01$). Twelve students initially scoring low on both instruments also interviewed to examine how the instruction influenced their responses on the instruments. Nine of the students became more accepting of evolution, which they attributed to learning about the volume of evidence for evolution (especially transitional fossils) and learning about the history of life. These findings have important implications for evolution education policy and practice at the post-secondary level.