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Using Possibility Books to Develop Creativity Mindsets - a New Pedagogy for Learning Science, Math, and Engineering

Authors : Michael R. Taber, Kristin Stanec

Abstract : This paper presents year-two of a longitudinal study on implementing Possibility Books into undergraduate courses to develop a student's creativity mindset: tolerating ambiguity, willingness to risk failure, curiosity, and openness to embrace possibility thinking through unexpected connections. Courses involved in this research span disciplines in the natural and social sciences and the humanities. Year one of the project developed indices from which baseline data could be analyzed. The two significant indices (> 0.7) were "creativity mindset" and "intentional interactions." Preliminary qualitative and quantitative data analysis indicated that students found the new pedagogical intervention as a safe space to learn new strategies, recognize patterns, and define structures through innovative notetaking forms. Possibility Books in Natural Science courses were designed to develop students' conceptualization of science and math. Using Possibility Books in all disciplines provided a space for students to practice divergent thinking (i.e.,Possibilities), convergent thinking (i.e., forms that express meaning), and risk-taking (i.e., the vulnerability associated with expression). Qualitative coding of open responses on a post-survey revealed two major themes: 1) Possibility Books provided a mind space for learning about self, and 2) provided a calming opportunity to connect concepts. Quantitative analysis indicated significant correlations between focused headspace and notetaking ($r = 0.555$, $p < 0.001$), focused headspace, and connecting with others ($r = 0.405$, $p < 0.001$).

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