

Everyday Settings & Family Activities

Case Studies of Culturally Responsive Teaching in STEM Education



Sources of Engineering Teaching Self-Efficacy in a STEAM Methods Course for Elementary Preservice Teachers

Webb and LoFora (2020) examine the effects of a STEAM (science, technology, engineering, arts, and mathematics) preparation course focusing on pre-service teachers' (PTs') self-efficacy and perceptions of integrating engineering practices. Their study championed around engineering design as the gateway to integrate other subjects. Self-efficacy sources of cognitive content mastery, cognitive pedagogical mastery, vicarious experience, verbal persuasion, and emotional state were leveraged through course instruction enhancing teachers' perception of STEAM self-efficacy. Qualitative data analysis revealed cognitive pedagogical mastery, simulated modeling vicarious experiences, and emotional state were the most influential sources attached to positive self-efficacy. PTs' self-efficacy to integrate engineering practices increased significantly. Authors implore teacher preparation programs to improve their support of pre-service teachers by offering additional engineering methods courses.¹

[VIEW THE CASE STUDY ONLINE](#)

Engaging High School Girls in Native American Culturally Responsive STEAM Activities

Kant and Meyers (2018) examined the impact of STEAM culturally responsive activities, immersed in Dakota and Lakota values, of high school girls at a Federal Native American boarding high school. Their qualitative and quantitative, exploratory place-based case study was undergirded by Liberation Theology, Critical Theory, Social and Cultural Capital Theory, and Native voice from the position of discovery. Data analysis of a Likert scaled post-project survey revealed most of the participants agreed that they enjoyed studying science, technology, and engineering (STE). Post-project focus group results also revealed a connection between culturally relevant enrichment activities and increasing interest in STEM and STE careers. Authors recommend taking small steps when integrating equitable representation in STEM by creating interests through culturally related activities, increase participants' cultural and social capital through visits to relevant STEM destinations, include Native voice, and provide constituent culturally responsive teaching and learning opportunities.²

[VIEW THE CASE STUDY ONLINE](#)

¹ Webb, D. L., & LoFaro, K. P. (2020). Sources of engineering teaching self-efficacy in a STEAM methods course for elementary preservice teachers. *School Science and Mathematics*, 120(4), 209-219.

² Kant, J., Burckhard, S., & Meyers, R. (2018). Engaging high school girls in native American culturally responsive STEAM activities. *Journal of STEM Education*, 18(5).