

Washington State University

College of Education

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Will defend the dissertation

Date: April 22, 2021

Time: 1:00 P.M.

Location: Zoom by request

Faculty, students and the general public are encouraged to attend

**INFUSING EMPATHY INTO THE ENGINEERING DESIGN PROCESS: GIRLS'
INTEREST AND SENSE OF BELONGINGNESS IN STEM**

Chair: Kristin Lesseig

Numerous reports focus on why girls and women do not pursue and persist in Science, Technology, Engineering and Mathematics (STEM) study or careers, and how to influence their Interest. Since human affects, like Interest, are ever-changing, multi-dimensional, and connected constructs, their study is difficult. Some researchers, including myself, have conducted large-scale quantitative research studies and determined relationships amongst affective constructs by applying complex statistical methods. It seems the reasons that many females do not pursue STEM are deeply rooted and influenced by the environment and other factors. My nine-week study of an after-school program in a low-income urban public school was mixed methods, but primarily qualitative. The study was based on relationships between student Interest and Belongingness, how these constructs intersected and changed after four girls worked on engineering design projects infused with an Empathy element. Recent divisive national events have exposed the need for Empathy, usually considered a feminine trait, within STEM. Because of the affect's visibility, its influence, especially to Belongingness, has become more relevant.

I found that Interest in STEM and in STEM Careers, Sense of Belongingness, and Understanding of Empathy/Empathic Design improved, but not consistently. There appeared to be an intersectionality among constructs, but not all the time for all the constructs. Belongingness and Empathy also seemed multi-dimensional and multi-phased as Hidi and Renninger suggested in their 2006 study of Interest.

"Acceptance is the Sense of Belonging," MF Moonzajer