

USING MULTIPLE STRATEGIES TASKS TO EXPLORE PRE-SERVICE TEACHERS' PERSISTENCE

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This study explored influential factors that affect pre-service teachers' (PSTs) persistence in mathematics learning during professional development (PD). As a part of a larger study, this study was guided by concepts of persistence and mindset - "the core beliefs students have about learning and the change that learners may or may not be conscious of." (Dweck, 2006; p.6) Persistence is an action when students continue to engage in a mathematical task despite facing challenges (Boaler & Staples, 2008). Studies on persistence have focused on students' traits (Cobb, Gresalfi, & Hodge, 2009; Grant & Sonnentag, 2010; Rayneri, Gerber, and Wiley, 2006), while factors that affect students' development of such traits have not been studied.

In mindset interventions, MS has been used as a problem-solving approach, but few have studied how MS fosters a growth mindset (Lynch & Star, 2014). Lynch and Star developed instructions to encourage MS in the student-teacher dialogue. Multiple Strategies (MS) intervention encourages students to use more than one method to solve a math task (Silver, Ghouseini, Gosen, Charalambous, & Strawhun, 2005). This includes teachers' ability to assess which solutions that students came up with should be discussed to encourage students for further inquiry (Stein, Engle, Smith, & Hughes, 2008). However, if teachers are not careful, the instructional can become a "show-and-tell" (Ball, Lubienski, & Mewborn, 2001), and subsequently hinder students' persistence. This led to the research questions of the study: *How do PSTs choose to persist when problem-solving with challenging tasks? How MS-based PD impacts PSTs' persistence in challenging mathematics tasks?*

The study participants are a convenient sample of pre-service K-12 teachers who attended the PD, delivering the MS intervention, an opportunity offered by the College of Education at a large mid-western university. Surveys were used to measure PSTs' to measure mindset (Levy, Stroessner, & Dweck, 1998), and persistence (Duckworth, Peterson, Matthews & Kelly, 2007). Among the PD attendees, PSTs attended at least four sessions out of five total PD sessions. 12 PSTs met this requirement Further qualitative analysis was done among the 12 and six PSTs agreed to participate in follow-up PD interviews.

Analyses of PSTs' cases helped understand PSTs persistence views on the task can be affected by knowing the instructional practice of MS was available through working with peers in a collaborative learning environment. PSTs also appreciated the opportunity to work on challenging tasks with a reminder of the availability of MS during the PD. It was challenging to understand the relationship between PSTs' persistence levels and their views on success or failure, as all demonstrated a high persistence level. Further studies with PSTs with varied persistence will reveal this relationship.

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