AAAS | **ARISE**
Advancing Research & Innovation in the STEM Education
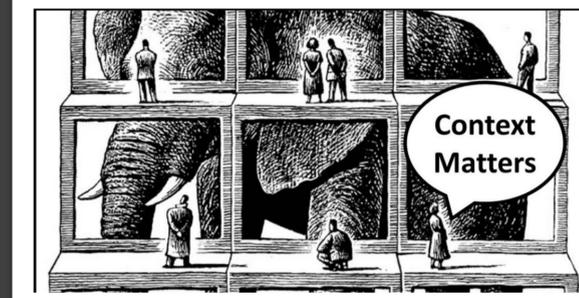of Preservice Teachers in High-Need School Districts

NSF

ACTIVE LEARNING PEDAGOGY: PREPARING STEM TEACHERS TO SERVE TRADITIONALLY UNDERSERVED

Incorporation of active teaching and learning strategies in STEM classrooms found national amplification when the White House Office of Science and Technology Policy initiated Active Learning Week - now a joint initiative of the AAC&U, the AAAS, &100Kin10 – focusing on ensuring that all practices are culturally responsive and fully grounded in the lived experiences of students.

Context Matters

CULTURALLY RELEVANT PEDAGOGY

The TAKE AWAY

SUPPORTING ALL LEARNERS

Fostering Critical Science Teaching Agency

✓ Investigating the development of teacher identity and critical agency for teaching during preservice and induction is needed to generate critical insight into best practices for how to prepare preservice teachers to serve in diverse, urban schools.
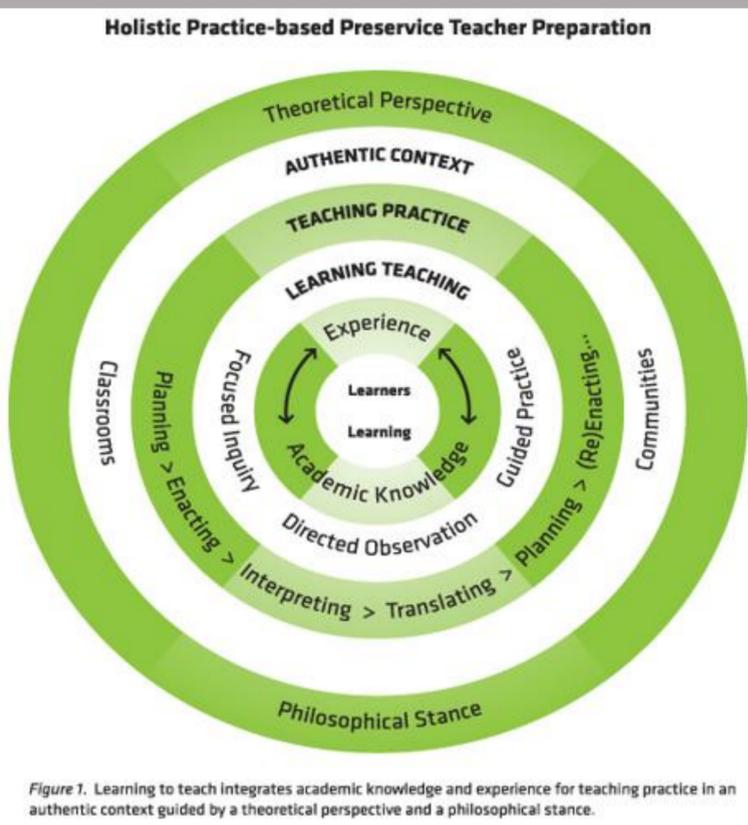
Preliminary findings:

Figure 1. Learning to teach integrates academic knowledge and experience for teaching practice in an authentic context guided by a theoretical perspective and a philosophical stance.

✓ Teaching Identity correlated with career interest & taking next course.

✓ Instructor and Mentor Teacher feedback, use of manipulatives in field, and recognition as teacher are predictive of teaching identity.

Addressing Class in Class

✓ Low floor, high ceiling tasks allow everyone to participate regardless of academic level or background, while promoting divergent thinking.

✓ Promoting growth mindset moves students beyond the power of yet.

Universal Design for Learning (UDL)

✓ Learner variability is even greater than previously believed.

✓ UDL is a framework, being used in K-12 as well as Higher Education contexts, that can purposefully address learner variability and reduce barriers.

Implementing Active Inquiry and Engineering Design Curricula

✓ Provides multiple modes of performance and engagement for diverse learners, driving home real-world applications

Bring STREAM Education on Stream

✓ Needs to be understood as an interdisciplinary approach when teaching any two or more of STEM disciplines integrated with other school subjects.

✓ Focus on how students make use of knowledge - "what you can do with what you know" - to increase ability to apply their content knowledge to real-life situation.