Module 1:

**Learning Outcomes for Module 1 -**The Educational Theory and Evidence Behind Teaching STEM Through Public Problems/Civic Questions  
Having completed Module 1 participants will be able to:

* + Explain in their own words, several key educational theories as they relate to the "ecosystem" of STEM learning.
  + Describe current cultural, political, and economic changes that have impacted higher education in the 21st century.
  + Describe several of the transformative movements, organizations, and "levers for change" that have emerged to improve learning and analyze/evaluate their longterm impact.
  + Define student-centered pedagogy and identify elements of active learning in example scenarios and materials
  + Using evidence, defend the value of inter and trans-disciplinary approaches in a variety of contexts
  + Demonstrate an understanding of the issues associated with inclusion, diversity, and cultural competence in STEM education.

Readings:

National Research Council. 2000. *How People Learn: Brain, Mind, Experience, and School: Expanded Edition*. Washington, DC: The National Academies Press. https://doi.org/10.17226/9853.

Handelsman, J., Ebert-May, D., Beichner, R., Bruns, P., Chang, A., DeHaan, R., ... & Wood, W. B. (2004). *Scientific teaching*.

Kezar, A., DePaola, T., & Scott, D. T. (2019). *The gig academy: Mapping labor in the neoliberal university*. Johns Hopkins University Press.

American Association for the Advancement of Science. (2019). Levers for Change: An assessment of progress on changing STEM instruction.

National Academies of Sciences, Engineering, and Medicine. 2018. *The Integration of the Humanities and Arts with Sciences, Engineering, and Medicine in Higher Education: Branches from the Same Tree*. Washington, DC: The National Academies Press. https://doi.org/10.17226/24988.

Asai, D. J. (2020). Race matters. *Cell*, *181*(4), 754-757.

<https://www.cell.com/cell/pdf/S0092-8674(20)30337-8.pdf>

National Research Council. 2014. *STEM Learning Is Everywhere: Summary of a Convocation on Building Learning Systems*. Washington, DC: The National Academies Press. https://doi.org/10.17226/18818.

Assessment via reflective journal and portfolio entries.