The Rise of STEM Education

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Conclusions and recommendations

Contemporary trends in STEM education offer new insights into best practices for exciting students about STEM. Exposing them to STEM careers early in the pipeline is a practical and effective way to ensure that they have the time, tools, and resources to attain STEM careers in the future. Of the more important lessons learned from my research is that retaining students in undergraduate STEM courses is much different than retaining students in the STEM education-to-career pipeline. Undergraduate students who choose STEM education have already been supported through the more dangerous early years where their STEM participation could be compromised, so my recommendations for positioning students for STEM careers center on tending to students' early learning ecologies, paving inroads toward reconciling longstanding science stereotypes, and offering experiences that can shift URM students’ identities and prepare them for transformative career opportunities. Early support for STEM learning patches holes in the leaky STEM education-to-career pipeline, thus positioning more students for exciting, impactful, transformative STEM careers of the future. To this end, the following recommendations are provided as pillars for research and implementation to help better position students for STEM careers:

Work collaboratively across disciplines to elucidate and remediate factors that influence STEM learning and efficacy. Collaborative, interdisciplinary teams are powerful. No individual has all the answers to the pressing questions we have covered in this article but working collaboratively toward a goal of increasing STEM persistence and performance to position students for STEM success is a viable tool for delivering transformative research and designing impactful interventions. Working in silos is counterproductive for positioning diverse students for success.

Ensure your work is stakeholder informed and vetted. Despite my strong focus on delivering transformative STEM opportunities for students, I am not a parent and have limited knowledge about what parents want for their children in STEM education. Therefore, I advocate for working closely with not only students as key stakeholders, but also parents, teachers, and administrators. Everyone who interacts with the student has vital information to share about the students' needs, how those needs can best be met, and what resources have already been made available. This is important, because doubling up on resources may or may not be beneficial to students. For example, in our work in third–fifth-grade classrooms, we found that although our target schools were labeled as “at-risk”, previous federal dollars had equipped classrooms with good technology. Each student had digital tablets, smart boards and televisions were in every classroom, and microscopes, beakers, and other tools for science were abundant. It would have been futile to provide more of these tools for science, so working with key stakeholders informed my team about what needs had already been met so that we could meet unmet needs.