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Excellence in Physics Education Award (2021): Excellence in Physics Education Award Talk: Transforming Diversity and Equity in K-12 STEM Education Research, Practice, and Policy

ANDERSON SUNDA-MEYA, Xavier University of Louisiana

Although in the last few decades students from underrepresented groups have made strides in science and mathematics, only a small percentage of these students become scientists, mathematicians, and engineers. Recent studies have focused on issues of preparation, emphasizing the need for advanced coursework to be made available in schools where there is high enrollment of underrepresented students. Other studies have highlighted the need for project-based learning. The purpose of our work has been to address persistent barriers to the pursuit of higher education and careers in STEM fields for students from underrepresented and economically disadvantaged backgrounds arising from lack of rigorous middle and high grades preparation and a lack of parent and student engagement in STEM. We believe a really change will come from the change of focus from individual to society by addressing the structural or institutional inequities of STEM education that are socially, culturally, politically, and historically defined. Our conceptual model will employ theoretical framework such as critical race theory, antideficit achievement, opportunity hoarding, to reverse the commonly focused question about disadvantages in education, underrepresentation, inadequate preparation, academic deficits, detachment, to one of how STEM education research, policy, and practice are seeking to unpack and understand the social, cultural, political, and historical nature of identity and experience.