

Chapter 90

STEM for All: The Importance of Parent/School/ Community Partnerships Across the K–12 Pipeline and Beyond

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ABSTRACT

Science, technology, engineering, and mathematics (STEM) concepts are the very foundation of the contemporary and futuristic way of life for the United States and other socio-political entities as well. Yet, growth in STEM education participation has, despite programs of intervention, remained sluggish, rendering an American economy that has become increasingly dependent upon imported STEM talent. This chapter argues that the asymmetric outcomes that are observable across the educational pipeline reflect unique barriers to entry that are not only based upon IQism, but socioeconomic as well as socio-cultural diversity. Utilizing a review of selected literature, the thesis is introduced that a STEM-for-all movement is needed that remediates STEM exclusion. Throughout the discussion, strategies are recommended for policymakers, institutions of education, communities, and families in reversing the growth of a new STEM-based system of social stratification.

ESSENTIAL QUESTIONS

- What is the current status of STEM participation among students in the United States?
- How do we assist STEM students and their families of diverse backgrounds through the K-12 pipeline, and beyond?
- Is there a relationship between STEM participation rates in U.S. society and socioeconomic as well as sociocultural diversity?

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- What type of strategies can key stakeholders apply to support STEM inclusion among culturally and socioeconomically diverse communities and families throughout the K-12 pipeline and beyond?
- To what degree do the Next Generation Science Standards (NGSS) support stronger familial participation in the STEM inclusion process?
- What can policymakers, schools, and other key stakeholders do to advance STEM inclusion efforts at the K-12 levels and beyond?

By equity pedagogy, I simply mean that teachers change their methods to enable kids from diverse racial groups and both genders to achieve.... Equity pedagogy has to do with the physics teacher not so much adding content about women physicists and African American physicists, but rather the physics teacher changing the way she teaches physics, for example, so that girls and African Americans can learn physics. -James Banks

INTRODUCTION

The theme of this book – social justice and parent partnerships throughout the K-12 pipeline – is one of tremendous importance. Sensoy and DiAngelo (2017) explore alternative definitions of this oftentimes nebulous concept. One implication of this discussion is that central to the notion of social justice is improved access to social and economic resources including education for all groups and subgroups. For example, Rojas and Liou (2016) describe a unique approach that was tested in an effort to ensure equal access to learning across all students in their classrooms. They argue that variables such as teacher pedagogical style, empowering curricula, caring relationships and social power influence opportunities and access to social justice. Numerous examples of social justice interventions in education have also been described in educational literature (Cochran-Smith, Shakman, Jong, et al, 2009).

Independently of the definition of social justice used, and separately from the controversies that the integration of the concept of social justice into education has triggered, a consensus exists that the full inclusion of all students as beneficiaries of education cannot be achieved through a passive reliance upon policy change alone, nor solely by way of alterations in the pedagogies of lone teachers operating within the confines of their classrooms. Rather, extensive partnerships are needed. Moreover, parents must play a central role in the formation and operationalization of these partnerships. Throughout the various sections of this book, unique areas of need have been identified and recommendations made for the use of school/community and parent partnerships in their resolution. This chapter seeks to complement these earlier chapters by identifying one of the arenas in which the need for acts of inclusion is extreme. This is the area of Science, Technology, Engineering and Mathematics (STEM) education. Moreover, progress towards the greater inclusion of students of diverse backgrounds in the STEM movement not only requires parents/school/community partnerships at the K-12 level, but throughout the K-20 pipeline. The logic that undergirds such as statement is quite linear. Entry into STEM careers begins in kindergarten and must oftentimes extend into graduate school in order for full access to the STEM marketplace to occur. Thus, this final chapter seeks to define key roles for a variety of stakeholders in order to advance opportunities for STEM inclusion in the K-12 pipeline and beyond.

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