EF+MATH

Collections

In this document, we share readings and resources provided to participants in the **Facilitated Team Development** process (a track we created to allow individual participants to find team members and co-create multi-disciplinary EF+Math proposals together). Please use these resources as background material as you generate your proposal for the **Prototyping track** of the EF+Math program. The lists are not meant to be exhaustive but rather help provide relevant perspectives and background materials for you to generate big ideas at the intersection of equity, executive functions, and mathematics. Please also see our recently published **primer** for a consolidated perspective on relevant research findings.

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Math Education and Cognition

- **NCTM Principles to Actions**
  - Executive Summary of National Council of Teachers of Mathematics (NCTM)'s landmark publication *Principles to Actions* connects research with practice. Specific, research-based teaching practices that are essential for a high-quality mathematics education for each and every student are combined with core principles to build a successful mathematics program at all levels.

- **How Revising Math Exams Turns Students Into Learners, Not Processors**
  - This blog explores how one teacher at Lakeview High School in Battle Creek, Michigan, developed a new approach to help her students learn the “how” and “why” of math.

- **How to Help Students Build Positive Mindsets Around Math**
  - Dr. Gerardo Ramirez describes how students interpret their experiences learning mathematics and how to support them in creating positive math mindsets.

- **Everyday mathematics, mathematician's mathematics, and school mathematics: Can we bring them together?**
  - This chapter explores the tensions and compromises of having children doing mathematics like mathematicians by working on open-ended and investigative situations, sharing ideas and strategies, and jointly negotiating meanings while also developing activities that build on the students' experiences with everyday mathematics in an effort to bridge the gap between outside and inside school experiences.

Designing for Equity

- **Designing Learning for Equity**
  - In this video, University of California Berkeley professor Dr. Na'ilah Suad Nasir discusses designing learning for equity and explores relationships between learning and identity.

- **Promoting Racial Literacy in Schools**
  - In this video, Professor Howard C Stevenson provides an overview of his book *Promoting Racial Literacy in Schools*. Based on extensive research, this provocative book explores how schools are places where racial conflicts often remain hidden at the expense of a healthy school climate and the well-being of students of color.

- **'You Can't Lift People Up by Putting Them Down': How to Talk About Tough Issues of Race, Poverty, and More**
  - In this article, Trabian Shorters describes how to apply Asset-Based Framing by defining people by their aspirations and contributions before noting their challenges.

- **How to Be an Anti-Racist**
  - This video provides an introduction to Dr. Ibram X. Kendi's latest book, How to Be an Anti-Racist.

- **Dismantling White Supremacy Culture**
  - Description: This article by Tema Okun is a list of characteristics of white supremacy culture that show up in our organizations.

- **Can Experts Solve Poverty?**
  - This video by the #GlobalPOV Project discusses the ways in which approaching social problems with only technical solutions hide important context, history, and politics. As a result, technical experts often propose solutions that ignore the systemic challenges that lie underneath the problems.

- **Look Different**
  - MTV's "Look Different" campaign.

- **How racism makes us sick**
  - Why does race matter so profoundly for health? David R. Williams developed a scale to measure the impact of discrimination on well-being, going beyond traditional measures like income and education to reveal how factors like implicit bias, residential segregation and negative stereotypes create and sustain inequality. In this eye-opening talk, Williams presents evidence for how racism is producing a rigged system -- and offers hopeful examples of programs across the US that are working to dismantle discrimination.

- **The trauma of systematic racism**
    - T. Morgan Dixon and Vanessa Garrison, founders of the health nonprofit GirlTrek, are on a mission to reduce the leading causes of preventable death among Black women -- and build communities in the process. How? By getting one million women and girls to prioritize their self-care, lacing up their shoes and walking in the direction of their healthiest, most fulfilled lives.

- **How to overcome our biases? Walk boldly towards them**
    - Our biases can be dangerous, even deadly — as we've seen in the cases of Michael Brown in Ferguson, Missouri, and Eric Garner, in Staten Island, New York. Diversity advocate Vernā Myers looks closely at some of the subconscious attitudes we hold toward out-groups. She makes a plea to all people: Acknowledge your biases. Then move toward, not away from, the groups that make you uncomfortable. In a funny, impassioned, important talk, she shows us how.

- **Who, me? Biased?**
    - What is implicit bias? NYT/POV's Saleem Reshamwala unscrews the lid on the unfair effects of our subconscious.

Math Equity

- **The Opportunity Myth**
  - TNTP Study outlining messaging to students that doing well in school creates opportunities and debunking this messaging with data of the realities that showing up, doing the work, and meeting teachers' expectations does not prepare students for their futures and is all a myth.

- **Critical Race Theory in Math Education**
  - *Critical Race Theory in Mathematics Education* brings together scholarship that uses critical race theory (CRT) to provide a comprehensive understanding of race, racism, social justice, and experiential knowledge of African Americans' mathematics education.

- **In equity circles, teachers confront their biases and stereotypes**
  - How might this inform researchers' insights as they build systems teachers and students can use?

- **The Brilliance of Black Children in Mathematics**
  - The first section of the book, The Brilliance of Black Children in Mathematics by Jacqueline Leonard & Danny Martin, provides some historical perspective critical to understanding the current state of education in the U.S., specifically for the education of African American children. The following sections include chapters on policy, learning, ethnomathematics, student identity, and teacher preparation as it relates to the mathematical education of Black children.

- **Mathematics Education Through the Lens of Social Justice: Acknowledgment, Actions, and Accountability**
  - A joint position statement from the National Council of Supervisors of Mathematics and TODOS: Mathematics for ALL

- **Culture, Race, Power, and Mathematics Education**
  - This book chapter examines research aimed at understanding the various intersections between issues of race and mathematics teaching and learning.

- **Framing Equity: Helping Students "Play the Game" and "Change the Game"**
  - This article (Gutiérrez, 2009) introduces a framework for equity that entails the dimensions of Access, Achievement, Identity, and Power. Beyond knowledge and skills, teachers need an "equity stance" that embraces and works to balance the tensions between these four dimensions.

- **Culturally Relevant Pedagogy**
  - In this article, Dr. Ladson-Billings reflects on the history of her theory of culturally relevant pedagogy and the ways it has been used and misused since its inception. She argues for the importance of dynamic scholarship and suggests that it is time for a "remix" of her original theory: culturally sustaining pedagogy, as proposed by Paris (2012).

Executive Functions

- **Executive Function: Implications for Education**
  - "Executive function (EF) skills are the attention-regulation skills that make it possible to sustain attention, keep goals and information in mind, refrain from responding immediately, resist distraction, tolerate frustration, consider the consequences of different behaviors, reflect on past experiences, and plan for the future. As EF research progresses, scientists, teachers, and parents are becoming more aware of the importance of these skills for learning in school settings for all students and especially for those at risk due to various factors, such as disabilities. In this paper, the authors highlight some key findings on EF and focus on its relevance to education research and practice."

- **The Role of Executive Function Skills in the Development of Children's Mathematical Competencies**
  - "In this chapter, we will review the existing evidence for the role of executive functions in mathematics achievement before considering existing and new evidence concerning the involvement of executive function skills in specific components of mathematics. We will finish by presenting recent evidence for the direct and indirect role of executive functions on children's mathematics achievement and considering the important distinction between learning and performing mathematics."

- **Does Schooling Promote Executive Functions? Differential Working Memory Growth Across School-Year and Summer Months**
  - Jenna Finch discusses exposure to school as a predictor of differences in executive functions between children from high and low SES homes.

- **First year of grade school sharpens kids' attention skills**
  - Garvin Brod and colleagues show that formal schooling accelerates development of executive function skills and the brain networks supporting those skills.

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EF+Math Collections of Resources

Citation: EF+Math Program (2021). *EF+Math collection of resources.*

Publisher: AERDF

Link to Collection: https://hdl.handle.net/20.500.14099/4

Version: 1.0

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Together, we advance scientific discovery and inventions that generate new, powerful emergent technologies, programs, tools, methodologies, and solutions – catalyzing PreK-12 learning nationwide.

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