

COMMENTARY

To Hook Students on STEM, Start With Their Parents

Parents are an untapped resource, research suggests

By Judith Harackiewicz

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There's a fair amount of hand-wringing about how to get students interested and engaged in STEM subjects. We do know that the pipeline leading to STEM careers begins to leak in high school, when students are faced with decisions about taking advanced mathematics and science classes. Decades of research show that a key factor motivating adolescents to pursue these advanced courses is the perception of utility value. Essentially, if a student perceives that taking a calculus or physics class will be useful in daily life or in a future career, the student's motivation to take that optional class will increase. My own research with my colleagues also demonstrates that understanding the future value of the subject matter can build student interest and improve performance.

More recently, my research colleagues and I examined the role of parents in communicating utility value to their children. It turns out, it's critical. Teachers, parents, and peers can all contribute to students' perception of value. But parents, who are often an untapped resource, can play a crucial role in their children's learning and motivation because they know what interests them.

In 2007, my research colleagues Chris Hulleman, Janet Hyde, Chris Rozek, and I began a multiyear longitudinal study to test the effectiveness of an intervention aimed at encouraging conversations about utility value between parents and their teens.

The parents of 87 10th graders received a colorful, glossy brochure ("Making Connections: Helping Your Teen Find Value in School"). When the students were in 11th grade, the parents received another brochure ("Helping Your Teen with the Choices Ahead"). Parents were also given access to a password-protected website. But families in the control group received none of the resources. All the parents and their teens were interviewed during the summer after 10th, 11th, and 12th grades. Eighty-six percent of the parents said they shared resources with teens. In 82 percent of the families, at least one parent logged into the website. We followed the teens through age 20, five years after the intervention started, when most were halfway through college.

Teens whose parents received the experimental intervention perceived math and science to be more valuable and important, obtained higher scores on the math and science ACT test, and actually enrolled in more math



and science classes in 11th and 12th grades. These results are remarkable because they suggest that a relatively modest intervention with parents can influence important academic outcomes for their teens.

Our five-year follow-up suggests that these changes can be long-lasting and have a significant impact: Greater high school preparation (taking STEM courses and having strong ACT scores) was associated with increased STEM career pursuit at age 20. We also saw an increase in students' STEM career interest and the number of STEM courses they took in college. These findings are the first to demonstrate that a brief motivational intervention with parents can have large effects on high school STEM preparation, as well as downstream effects on STEM career pursuit five years later.

Theoretically, this research contributes to our understanding of value transmission and interest development. Practically, it suggests that teachers and parents can make important contributions to students' math and science learning and motivation by focusing on its current and future value. The intervention developed and tested here is cost-effective, and policymakers and district and school leaders might consider ways to involve parents in promoting STEM motivation.

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