

Brain Fitness and Executive Function

Evidence-Based Interventions That Improve Student Outcomes

EXECUTIVE SUMMARY

THE CHALLENGE AND THE NEED

Despite many reforms in the U.S. education system, efforts to educate and prepare our nation's youth for the future are falling short. In 2015, the Organisation for Economic Co-operation and Development (OECD) assessed the academic proficiency of 15-year-old students from 35 countries across the globe, ranking our students 19th in science, 20th in reading, and 30th in mathematics. In this global economy, these results are a clear warning of the social and economic costs we will pay if problems in our education system are left unaddressed.

Simultaneously, stress and depression are rising at startling rates among students, and research has demonstrated a resulting negative impact on learning. Poverty and other adverse childhood experiences affect nearly half of all U.S. children, significantly impacting the achievement gap and often resulting in lifelong deficits in academic performance, employment, and overall well-being.

If we do not promptly and effectively address this educational and mental health crisis, our nation risks losing even more ground as a global leader.

APPLYING ADVANCES IN NEUROSCIENCE IN THE CLASSROOM

Scientific understanding of the brain has changed in recent years, and this new knowledge offers powerful tools to combat the challenge. We now know that the brain is highly malleable and continues to grow and change throughout our lives. Over the past decade, research has shown that brain fitness activities stimulate cognitive development and prime the brain for learning by improving key executive function skills of working memory, self-control and cognitive flexibility. These skills are also inextricably linked to social and emotional learning (SEL).

Effective brain fitness interventions during childhood and adolescence produce striking results in improving the executive function skills and prosocial behaviors that are more accurate predictors of academic readiness and life success than IQ or any other performance markers—offering affordable and effective solutions to today's educational challenges.

Results That Matter

This brief presents a vetted set of brain fitness programs that meet the evidence-based standards of the federal Every Student Succeeds Act (ESSA) that schools can adopt to support students' academic and social-emotional development. We focus on classroom-based opportunities because they can benefit children with executive functioning deficits the most without stigmatizing them, since all students in a class participate together and the intervention benefits them all.

Types of interventions reviewed include cognitive training, mindfulness, and executive function skills curricula. Outcomes for the 10 programs that met our full criteria include significant:

- increases in proficiency on state-mandated tests for math and reading
- improvements in school-administered tests of core subjects
- reductions in disruptive classroom behaviors
- increases in prosocial behaviors

Results that early adopter schools are achieving are compelling and warrant serious attention:

A 2018 study of a cognitive skills training program for students at a high poverty urban elementary school produced the following outcomes after just 10 hours of training:

- 80% pass rate in state standardized reading tests versus a 20% rate in the control group
- 60% pass rate in state standardized math tests versus a 10% rate in the control group

Studies conducted in 2012 and 2013 of a mindfulness program for students at economically diverse elementary schools found:

- 28% higher grades in reading, math and science
- 15% increase in average GPA
- 60% decrease in behavioral issues
- 43% decrease in teacher stress

Call to Action

Our society has a clear problem: many children's brains are not primed for learning, which reduces their cognitive and emotional skills. Youth brain fitness will inform the future academic, social, and economic outcomes of our country.

Adoption of the vetted programs highlighted in this report has risen by more than 40% over the past four years to 7,200+ schools, demonstrating a nationwide momentum toward brain-based approaches to improving student outcomes.

The U.S. cannot afford complacency. Schools do not need to wait for solutions to be developed and tested. Neuroscience-based programs that improve the outcomes of our youth are readily available. The power to take action and support the health, well-being and intellectual development of our youth is within the reach of every school in the nation. Policymakers, education leaders and faculty champions have the capacity to come together to radically improve the learning outcomes and social-emotional landscapes of students, and of our country's next generation.

The evidence is clear: every school in the U.S. should adopt an executive function program and executive function training should be a standard component of teacher certification programs.

In every cultural movement there is a tipping point—a time when sufficient and convincing evidence influences the population to make a change in a social norm. We believe education in the U.S. has reached this critical point.

Our nation's students are waiting.

BrainFutures is a national nonprofit organization dedicated to assessing and advancing the practical application of neuroscience research to maximize human potential.

Linda Raines, CEO, lraines@brainfutures.org | Holly McCormack, Chief Strategy Officer, hmcormack@brainfutures.org

www.brainfutures.org | 1301 York Road, Suite 505 Lutherville, MD 21093 | 443-901-1570