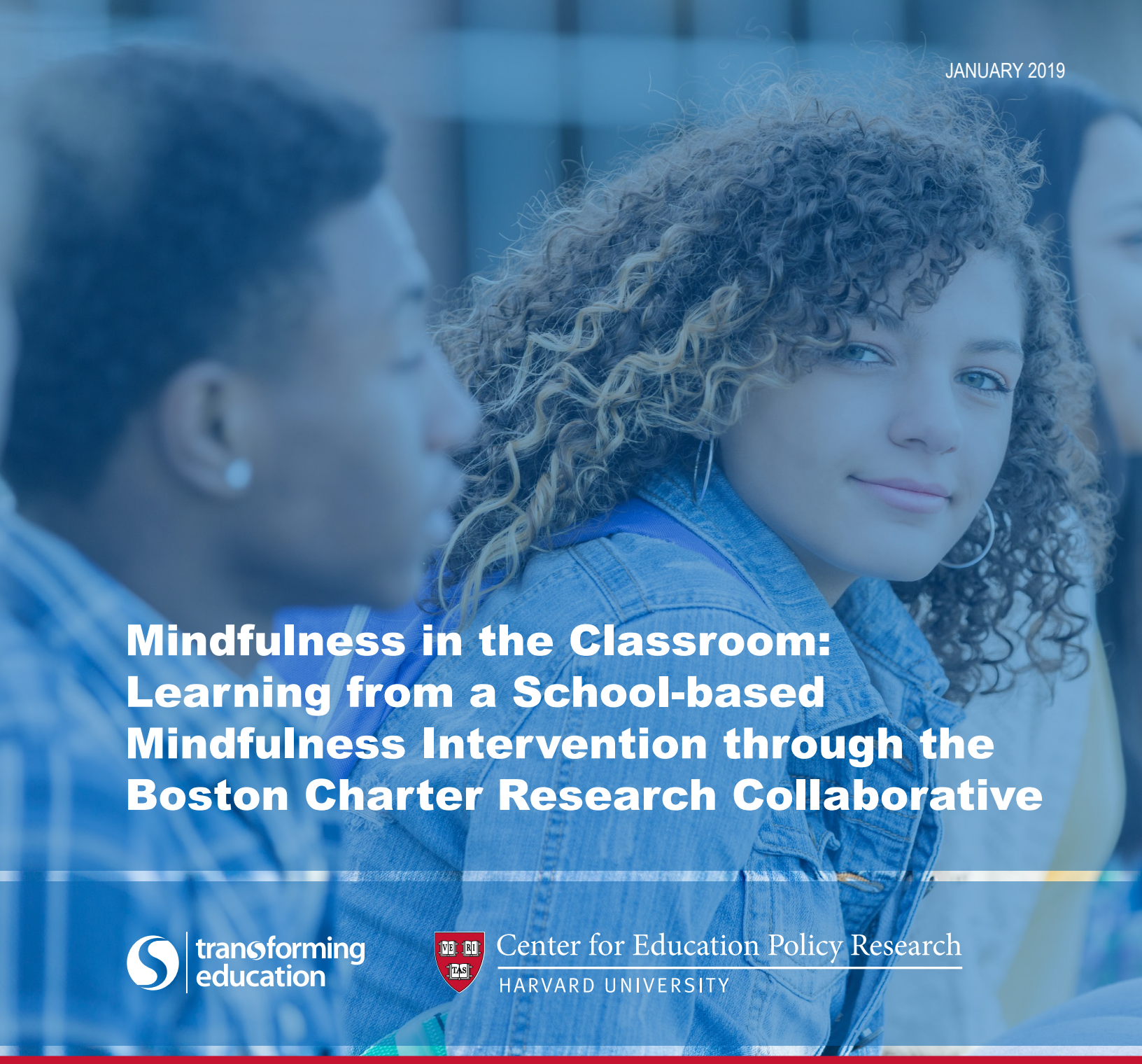

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# Mindfulness in the Classroom: Learning from a School-based Mindfulness Intervention through the Boston Charter Research Collaborative

transforming education

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Note that the views expressed in this paper do not necessarily reflect those of the Walton Family Foundation or the members of our National Advisory Board. Any errors in fact and interpretation are our own.

Transforming Education is interested in understanding a variety of programs and practices that support students in building the mindsets and skills they need to thrive. In this pursuit, we share information about emerging research, promising practices, and existing, available resources; however, we do not endorse specific programs, providers, or views expressed in linked resources.

## About Our Working Papers

Transforming Education is pleased to issue a series of working papers that are meant to distill information of value to educators, policymakers, and others in the field of social-emotional learning (SEL) in a form that can be readily updated as knowledge continues to emerge and be refined. Our working papers summarize the current state of knowledge and evidence about which skills matter for success in school, college, career, and life; how we can responsibly measure and build those skills; and which supports are needed for districts and schools to implement best practices. Because the SEL field is constantly evolving, we expect to revise our working papers periodically. Moreover, we hope educators, researchers, and policymakers will share additional research and effective practices related to social-emotional development.

If you have feedback or want to share your own approach to mindfulness in your district or school, please e-mail info@transformingeducation.org.

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EXECUTIVE SUMMARY

# Mindfulness in the Classroom: Learning from a School-based Mindfulness Intervention through the Boston Charter Research Collaborative

Mindfulness-based practices have been promoted as a promising way to reduce stress and anxiety in students and improve their academic and behavioral outcomes. Using surveys administered to middle school students attending schools participating in the Boston Charter Research Collaborative, we learned that greater self-reported mindfulness correlates significantly with better academic achievement and behavioral outcomes. These results encouraged us to further assess if a school-based mindfulness intervention could improve students' sustained attention, and therefore, their self-control.

We implemented a randomized controlled trial with 6th grade students at a partner school to study the impact of a school-based mindfulness intervention on students' sustained attention and perceived levels of stress. Students either participated in the mindfulness intervention or a coding training as part of the study. Students assigned to participate in the mindfulness intervention received eight weeks of mindfulness instruction, while a control group of students received training in computer coding. About half of the study participants also participated in brain imaging before and after the eight-week program. We found that students assigned to the mindfulness intervention condition showed a reduction in perceived stress and modest but significant improvements in sustained attention. These students also showed a reduced response of the amygdala, a brain structure associated with emotion and stress, to negative stimuli. Together, these findings suggest the potential value of mindfulness interventions for alleviating stress and enhancing sustained attention.

This paper reviews the findings from this study, in addition to other literature on the role, function, and helpfulness of mindfulness in education. Further research is needed to understand whether regular practice of mindfulness in the classroom could produce sustained improvements in academic and behavioral outcomes. We conclude the report with some recommendations and considerations for bringing mindfulness practices into the classroom.

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# Mindfulness in the Classroom: Learning from a School-based Mindfulness Intervention through the Boston Charter Research Collaborative

## Introduction

Mindfulness is defined as "increased, purposeful, nonjudgmental attention to the present moment."[1] Mindfulness training has been used in the medical field to reduce stress and anxiety and has become increasingly popular with large companies and organizations, including Google and the United States military.[2,3] More recently, mindfulness-based strategies have been promoted as a helpful tool for educators seeking to improve students' educational experiences and cognitive and social-emotional development, which can lead to better academic outcomes.[4]

Schools across the country are embracing mindfulness-based interventions (MBIs), and some studies find that teachers report students are more caring and focused after a few weeks of practicing mindfulness.[5,6] However, questions remain about the efficacy of such efforts due to inconsistency of results across studies and the paucity of studies with strong research designs.[7]

In many schools, mindfulness practices are used to address students' anxiety and depression, as well as to help them build coping skills and positive mindsets. For example, educators in schools such as Conway Elementary School in New Hampshire have been implementing a variety of mindfulness-related strategies, such as stretching and breathing exercises, to help all students process their emotions.[8] Like many schools, Conway Elementary sees the practice of mindfulness as part of a larger vision for prioritizing students' social-emotional learning.

> **"Self-control refers to the skills involved in planning, controlling, directing, and sustaining one's attention, emotions, and behavior. These abilities are positively related to reading, math, and linguistic abilities, […] as well as the ability to process social situations more accurately. Consequently, school-based programs which promote self-control may be particularly promising in boosting academic performance and social intelligence."**
>
> - Bauer, et al., 2018

### Current understanding about how mindfulness supports students

Current studies suggest that students participating in mindfulness programs show small but significant improvements in cognitive skills and in social and

emotional behaviors that are positively related to academic achievement.[9] MBIs have also been associated with gains in vocabulary and reading performance in several elementary grades, and, in limited cases, in grades 9-12.[10] Additionally, research suggests that mindfulness practices may be one way to foster self-control, or the ability to plan, control, direct, and sustain one's attention, emotions, and behavior.[11,12] Self-control enables students to regulate their behavioral, emotional, cognitive, and attentional resources so that they can accomplish a learning goal by facilitating persistent focus, reduced stress, decreased aggressive behavior, improved cognitive performance, and enhanced resilience. Better self-control is linked to improvements in completing tasks and understanding social situations more accurately.[13] Greater childhood self-control predicts better educational, health, and financial outcomes in adolescence and adulthood.[14] Among adults, greater self-control is associated with higher educational attainment, stronger interpersonal skills, and a greater sense of well-being.[15,16]

As preliminary studies of mindfulness practices have demonstrated promising results in the lab, additional studies have attempted to test if these results can be replicated in the classroom. Initial evidence suggests that classroom mindfulness interventions can reduce stress, decrease aggressive behavior, improve cognitive performance, and enhance resilience in students.[17] Mindfulness is thought to help with stress by increasing one's capacity to monitor experience, specifically by controlling attention and by practicing empathetic acceptance of emotions. By accepting experiences and feelings with curiosity, kindness, and awareness, students can work through those feelings more quickly by allowing the opportunity to pause and gain perspective on what is happening. In one recent randomized controlled trial (RCT), middle school children—predominantly African American students from a low-income background—self-reported improvements in mood and coping skills, as well as decreases in rumination after receiving a classroom-adapted mindfulness-based program.[18] Another program involving mindfulness found significant improvements in executive function, mental well-being, and prosocial behavior among 4th and 5th graders.[19] However, other RCTs have failed to detect any significant changes in mindfulness, depression, coping, and emotional awareness measures in children.

Therefore, existing research provides only a limited understanding of the impact of mindfulness practices on Pre-K-12 students. This is, in part, due to a lack of valid, developmentally-appropriate measures that enable students to accurately report on their self-awareness, which is necessary in order to detect changes in mindfulness. Furthermore, current measures can be especially challenging for younger children, since their self-awareness—and thus, their ability to provide accurate self-reports—is typically less developed.

## Studying mindfulness in the Boston Charter Research Collaborative

The Boston Charter Research Collaborative (BCRC) is a multiyear research-practice partnership among six high-performing charter management organizations (CMOs); researchers at the Center for Education Policy Research at Harvard University (CEPR) and the Massachusetts Institute of Technology (MIT); and Transforming Education (TransformEd). These organizations combine their expertise to conduct research and improve practice to support the development of students' social-emotional competencies (SEC) and cognitive skills that are not directly captured by academic assessments. (To learn more about the structure of the Collaborative, please read Launching a multi-year research-practice Collaborative: Lessons learned from year one.[20])

Through our work, members of the Collaborative wanted to 1) better understand the relationship between mindfulness and school-related outcomes, and 2) investigate the effects of a school-based mindfulness intervention. While, as described above, considerable research explored the value of such mindfulness-based interventions for enhancing social-emotional wellbeing, most of the existing work is not based in schools and tends to be in small samples.

## Exploring the link between mindfulness and academic achievement

We first explored the association between mindfulness and academic and behavioral outcomes by surveying over 2,000 students from BCRC CMOs in grades 5-8 using the Mindfulness Attention Awareness Scale (MAAS), a self-report tool adapted for children and adolescents.[21] Questions include, *I do jobs or tasks automatically, without being aware of what I'm doing, and I find myself preoccupied with the future or the past.*

The study revealed that **higher levels of mindfulness were associated with better grades, higher standardized test scores in math and English language arts, better attendance, and fewer suspensions.**[22] The findings persisted even when we accounted for students' prior academic performance, grade level, and demographic characteristics (i.e., gender, economic disadvantage, race/ethnicity, English learner status, and special education status).

This finding provides evidence that mindfulness is related to students' success in school. Yet, from our initial analysis, we were unable to determine whether students could improve their mindfulness through structured practice—and whether any such improvements would translate into better academic and behavioral outcomes.

## Effects of a school-based mindfulness intervention on students

To learn whether training students in mindfulness-based practice could improve student mindfulness, we collaborated with a local mindfulness organization and one of the schools participating in BCRC.

Calmer Choice is a Massachusetts-based non-profit that partners with local schools to deliver a mindfulness-based universal prevention program that aims to equip children with skills to improve resilience and self-control, reduce the impact of stress, manage emotions, and increase their sense of well-being. It does so by training school staff to deliver mindfulness-based programming directly to students and by providing resources for educators and parents to develop the same skills being taught in the classroom. Calmer Choice offers three kinds of programs: a program delivered to students by Calmer Choice instructors, a program that trains school staff members on mindfulness practices for themselves, and a program that trains adults to be Calmer Choice instructors.

For this collaboration, Calmer Choice adapted its school-based program with two Calmer Choice instructors who delivered the program directly to students. The program integrates social-emotional learning, mindful awareness training, health promotion, and wellness education adapted to the developmental level of middle school children. The program for this intervention took place over the course of eight weeks in the spring. Students assigned to the intervention group participated four times per week, in 45-minute sessions at the end of the school day, focused on building knowledge about mindfulness and providing time for guided practice. Meanwhile, their counterparts in the control group participated in computer coding activities in Scratch, a free programming language. Computer coding was selected for the active control condition because it was perceived by educators and students as having educational value yet was unlikely to influence the same set of outcomes targeted by the mindfulness intervention.

Each session of the intervention focused on a specific concept related to mindfulness and included a discussion of the concept, as well as activities and methods for conveying the concept being taught. For example, for a lesson on focus and attention, students engaged in an activity in which they explored how they experienced attention and distraction by focusing on a rock for one minute. Together, they discussed their observations about what they noticed when their minds wandered and refocused on the rock.

Students also engaged in mindfulness exercises specifically aimed at middle schoolers and were encouraged to practice for 5-15 minutes each day outside the classroom. Each lesson had a 'take it home and practice' component. In the session described above, students practiced a mindfulness exercise by following the sound of a bell ringing and concluded the session with a brief review of the lesson and instructions for a home practice geared at noticing how often their minds wandered. Instructors of the program heard anecdotally that students used practices like these in various settings outside of the program session, e.g., to fall asleep at night, before playing sports, or before or during a test.

To understand the effects of this program, we surveyed students in both the intervention and control groups about their self-control, perceived level of stress, and mindful awareness. We also used a performance-based measure of sustained attention and brain imaging tests (through functional magnetic resonance images, fMRI) with students who participated in the study to observe any changes in the function of areas thought to be impacted by mindfulness training and practice. These images measure brain activity by detecting changes associated with blood flow in the relevant areas of the brain (e.g., the amygdala).

**The findings indicated that participation in the mindfulness program produced modest, but significant, improvements in sustained attention and a reduction in self-reported perceived stress over time.**[23] This is consistent with the emphasis in mindfulness practices on sustained attention to thoughts and emotions that are presently occurring. By repeating this practice of paying attention to the thoughts and emotions one is experiencing, as is done in the beginning stages of mindfulness training, one may be able to build the capacity to pay attention for longer periods of time, leading to more capacity for insight, learning, and emotional self-regulation.

**Mindfulness training also reduced the response of the amygdala, a brain structure associated with emotion and stress, to negative stimuli. This was observed in the brain images of students who responded to photos of fearful facial expressions during brain imaging tests.**[24] The amygdala is critical to emotional regulation across the lifespan. Greater perceived stress can increase how much the amygdala reacts, which can then increase stress further. When someone looks at a fearful expression during an fMRI, the amygdala shows more activity than when the person sees a neutral expression. The fMRI study found that participating students who reported higher levels of perceived stress before starting the intervention also showed higher levels of reactivity in their amygdala. However, after the intervention, all students who received mindfulness training showed less activity in the amygdala when looking at the same expressions.

Perhaps surprisingly, the mindfulness training did not improve students' self-reported Mindfulness Awareness Attention Scale scores when students were surveyed at the end of the academic year. This was disappointing, as these scores had earlier been found to be positively associated with academic and behavioral outcomes (see prior section). There are several potential explanations for this result. The foundational changes in the brain may not have translated into enough additional self-awareness to change students' survey response. Alternatively, students may have needed more regular practice after the training completed in order to sustain the gains.

Taken as a whole, however, the study findings suggest that a school-based MBI has the potential to boost students' sustained attention and develop skills for coping with stress, thereby reducing their perception of stress. This result may be especially useful in informing efforts to support students who are experiencing adversity (e.g., due to high poverty, chronic stress, or trauma), which triggers a stress response in the body.

## Conclusion

In this BCRC study, an eight-week mindfulness program reduced students' perception of stress and increased students' capacity for sustained attention (an element of self-control). The benefits of the short-term mindfulness intervention described in this paper should motivate further research to examine whether a longer intervention or the ongoing practice of mindfulness in the classroom would yield larger and sustained benefits for students. Still, these promising findings suggest that students may benefit from mindfulness practices as part of their school day.

# Recommendations for Integrating Mindfulness in the Classroom

**The results documented above provide good reason to consider integrating mindfulness practices in the classroom. While not all schools can accommodate a full mindfulness program, we encourage those who are interested in school-based mindfulness interventions or practices to consider the following recommendations from educators and leaders of classroom-based mindfulness programs.**

1

**Focus on building consistency through school-wide buy-in.** Create opportunities and provide resources for school staff and students to learn jointly about the theory and science of mindfulness. The consistency of learning about and practicing mindfulness together across the school can allow students and educators to create a common language about their ongoing mindfulness practices and efforts. This can establish the approaches of acceptance, empathy, and self-care as a school norm for all members of the community.

Recommendations include learning about the science of mindfulness across the school and integrating practice time in staff and school community meetings.

2

**Provide teachers with dedicated time to engage in mindfulness practice themselves.** It is important to acknowledge the role of teachers' own understanding and practice. Mindfulness is taught "from the inside out." When teachers receive adequate training and engage in their own practice, they are better able to understand the theory more deeply and model the practices more authentically for students. Furthermore, mindfulness-based interventions can lead not only to improvements in teachers' own social and emotional well-being, but also in instructional climate and student engagement.[25] By engaging in this type of self-care and personal growth, teachers may become more emotionally supportive. They may also build and demonstrate greater sensitivity to students by reducing their own stress levels. This increases the chances for teachers to better recognize a student's perspective and understand how personal judgments or biases are impacting their reaction to a student.

Recommendations include creating time during the day and having a dedicated space for teachers to engage in mindfulness practices. Furthermore, it could be helpful to draw on various resources to support teachers' personal development of guided practice and mindfulness-based approaches at their own pace—for example, providing free resources (see last section of this brief), or trainings offered through continuing education courses.

3 **Make time for students to practice mindfulness.** The experiential component of learning about how to be more mindful and practice mindful awareness is critical to supporting student learning. As experts in the field suggest, the growth happens during the practice. Equally important is to allow students to self-identify spontaneous opportunities to practice on their own, as opposed to only prompting them to practice when their emotions run high. This encourages students' self-awareness of their own emotions and ability to self-regulate, rather than misrepresenting mindfulness as a tool through which their behavior is managed by others.

Recommendations for how to promote student practice include training teachers to lead practices or to use pre-recorded practices (which have the added benefit of allowing the teachers an opportunity to practice themselves). Moreover, teaching students about emotional awareness (e.g., emotion labeling) through explicit instruction and practice helps students build more awareness about their feelings and identify for themselves when they need to practice a mindfulness strategy. Setting classroom norms that allow students to make these decisions and providing a place to practice (e.g., creating a mindfulness corner in the classroom) can also promote student practice.

4 **Learn about how mindfulness can promote empathy among teachers and students.** A core tenet of mindfulness is acceptance and compassion for oneself and others. This can help those who engage in regular mindfulness practices approach others with increased acceptance and kindness for differences across people, including across races/ethnicities, gender identities, and varying levels of abilities. Authentic attention to this approach can help create an environment that is more inclusive of all members of a school community.

Recommendations include taking time to learn from each other about how experiences with practices might differ from person to person. It is equally important to build teachers' capacity to facilitate these reflective conversations with students.

5 **Ensure that mindfulness is integrated with a secular approach.** At least in secular schools, it is important for educators to use and teach about mindfulness in a way that neither promotes nor discourages the religious beliefs (or lack of beliefs) of teachers or students. The primary goal of mindfulness is to enhance well-being by developing one's attention, and thereby, reduce stress, acknowledge and accept one's range of emotions, and engage better with others (as opposed to advancing or inhibiting any particular set of beliefs).[26] Be inclusive in the way that mindfulness is taught. Make sure not to use any objects associated with any particular religion and make sure to never limit or invalidate the belief systems of others.

Furthermore, given the central aim of mindfulness as a means to improve well-being, its effects should continue to be held to the same rigorous, scientific evaluation standards as any other practice. Therefore, it is important to be up to date and responsive to any evidence that may emerge which challenges the claims of the effects of mindfulness.

## Mindfulness Resources to Explore

Ample, free resources exist online for educators wanting to learn more about mindfulness, including best-practices for students and adults, and the research supporting these practices. **Transforming Education provides a Mindfulness Toolkit online** that includes definitions, research, and an array of evidence-based practices for teachers seeking to implement mindfulness in various grade levels. The toolkit includes:

- More information on what mindfulness is and why it matters;
- A range of strategies teachers can integrate into their practice at all grade levels;
- A facilitator's guide for using the toolkit as an educational session (including an abbreviated guide for a 45-minute session);
- A video on student and parent perspectives on learning about mindfulness

Below are a series of resources to learn more about mindfulness. They have been prepared and made available by other organizations. We provide them here as they may be useful for practitioners, however please note that all content is the property of and reflects the beliefs of the authoring organizations.

### Mindfulness tools & exercises for students

- The Deep Breath Box: Square Breathing
- How to Belly Breathe
- 3 Fun Mindfulness Games for Kids
- ClassDojo's Mindfulness Activities
- Four Simple Exercises to Strengthen Attention
- 25 Fun Mindfulness Exercises for Children and Teens
- Multimedia Resources for Introducing Mindfulness in School

## Mindfulness and equity

Teaching Tolerance has explored the intersection of mindfulness and culturally responsive teaching in their article "Mindful of Equity."[27] In this approach, teachers are encouraged to explore and acknowledge their own biases, while also being aware of practices that acknowledge and challenge systemic inequities. A key recommendation is for teachers to understand and practice mindfulness deeply, themselves, to help them make connections and prepare them to respond to students' needs as they arise.

## More about the benefits of mindfulness in schools from Edutopia

Edutopia has recently compiled a list of resources for assistance with understanding the potential benefits of mindfulness, introducing mindfulness to students, implementing mindfulness in schools, and fostering wellness and effectiveness through mindfulness.[28] The list of resources and descriptions is as follows:

## Learn about potential benefits of mindfulness for learning

- **When Mindfulness Meets the Classroom:** Read an article that discusses increasing interest in mindfulness programs across various fields, early exploration of educational applications, and critiques and concerns. (*The Atlantic*, 2015)
- **Teach Mindfulness, Invite Happiness:** Discover how paying attention to present-moment experience may help students counteract the negative emotions and low self-esteem associated with a culture of standardized testing. (Edutopia, 2015)
- **Mindfulness in Education, Research Highlights:** Although research on mindfulness is still in early stages, studies show that mindfulness holds promise for positive effects on student health, well-being, social skills, and academic performance; read how mindfulness practices may also reduce stress and burnout for teachers and administrators. (Greater Good Science Center, 2014)
- **Can Mindfulness Make Us Better Teachers:** Learn about findings from a study that looked at how mindfulness can help teachers not only realize personal benefits but also be more effective in the classroom. (Greater Good Science Center, 2013)
- **"Just Breathe" Original Film:** Listen to young children describe their own experiences with mindfulness and noticing their experiences with anger, in this short film by Julie Bayer Salzman & Josh Salzman. (Mindful Schools)

## Explore ways to introduce mindfulness in the classroom

- **Applying Mindfulness to Mundane Classroom Tasks:** Find out how adding a fun, creative element of focus and stillness to a classroom routine can help students learn to appreciate and practice self-regulation. (Edutopia, 2015)
- **Integrating Mindfulness in Your Classroom Curriculum:** Explore four ideas for integrating mindfulness into curriculum-themed activities through exercises in breathing, sensory experience, guided imagery, and movement. (Edutopia, 2015)
- **Building Supportive Relationships in the Classroom:** Discover an activity that helps students develop a sense of mutuality and social awareness. (Edutopia, 2015)
- **Mindfulness Routines in the Classroom:** Read about how one experienced fifth grade teacher incorporates mindfulness and SEL routines into her daily classroom instruction. (Teaching Channel, 2015)
- **Mindfulness Starter Lesson:** Download a lesson script that can be used to help introduce mindfulness concepts to students. (Mindful Schools)
- **Mindful Pauses That Can Help Student Engagement:** Read an excerpt from the book *Mindfulness for Teachers: Simple Skills for Peace and Productivity in the Classroom* to learn about different kinds of wait time and the benefits of introducing pauses to slow down the pace of the classroom and invite deeper, richer processing. For more on the power of waiting, also see Edutopia's "Waiting is the Hardest (and Best) Part." (MindShift, 2015)
- **Outdoor Mindfulness Exercises:** Engage the senses through an outdoor mindfulness activity that will help young people appreciate their natural surroundings. (Edutopia, 2015)

## Implementing school-wide and after-school mindfulness programs

- **4 Essentials for a Successful Mindfulness Program:** Take a look at this analysis of key ingredients and lessons learned from some of the more established and successful mindfulness programs. (Edutopia, 2015)
- **Implementing a Schoolwide Mindfulness Program:** Explore ten tips about designing, developing, and successfully implementing school-wide mindfulness programs. (Edutopia, 2015)
- **Mindfulness at School Outside the Classroom:** Find out how to apply mindfulness beyond the classroom settings: within sports activities, wilderness programs, or retreats. (Edutopia, 2015)

## Fostering educator wellness and effectiveness through mindfulness

- **Dr. Richard Davidson on Teachers and Mindfulness:** Watch a video to learn more about research looking at how mindfulness training can help reduce teacher stress and burnout. (Center for Healthy Minds, 2013)
- **Mindfulness Practice for Teachers:** Check out two brief practices based on Mindfulness Based Stress Reduction that teachers can use to reduce negativity and avoid burnout. (Edutopia, 2014)
- **Mindful Facilitation in PBL:** To help students find their own way in PBL, use mindfulness techniques like tuning into your own body, nonjudgmental observation, and embracing the "don't know" mind. (Edutopia, 2016)
- **One-Minute Mindfulness Strategy:** Watch a video about an easy 30-60 second breath exercise that can help incorporate self-care into the days of school leaders. (ASCD Express, 2015)

## Recommended books about mindfulness *(provided by Calmer Choice)*:


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## About Transforming Education

Transforming Education (TransformEd) partners with schools and school systems to support educators in fostering the development of the whole child so that all students, particularly those from underserved populations, can thrive. At TransformEd, we envision a future in which all students become thriving adults, able and empowered to lead personally meaningful lives and to contribute to their communities.

Over the past six years, TransformEd has partnered with schools and districts serving over one million students in twenty US states to support practitioners in their efforts to identify, integrate, and sustain evidence-based and research-informed practices that create positive learning environments and support students' social-emotional development. We have pursued this work in our roles as partner to NewSchools Venture fund and their portfolio of innovative schools; as the lead strategic advisor to the CORE Districts; as the facilitator of the Boston Charter Research Collaborative; and as a partner, along with the RAND Corporation and CCSSO, in the National Center to Improve Social and Emotional Learning and School Safety, led by WestEd.

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