

SPECIAL ISSUE

Combining Biofeedback and Mindfulness in Education

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Mindfulness training programs are being integrated in many school systems around the world. Biofeedback professionals can use their unique training to help students and teachers learn and further develop powerful self-regulation skills that are incorporated in mindfulness training. Biofeedback training can improve learning these skills because of the clarity and specificity of the physiological feedback given through biofeedback training. There are numerous ways of integrating biofeedback and mindfulness that are beneficial to educators and students for reducing stress and anxiety and improving performance.

“Attention. Attention! Pay attention!”

How many times have we heard that, said that, or thought that, as children, parents, clinicians, and educators?

Attention, attention, attention—it’s all about attention. “Pay attention” means invest attention. What are we investing our attention in? Nothing we want to create, sustain, or see flourish will do so without attention. What transforms an idea, a goal, a plan, or a dream into reality is attention. It doesn’t matter whether the plan is to build a birdhouse or to realize the dream of a loving relationship; attention is required. Loving attention may be the highest quality attention. We give our loving attention to what we most cherish. Attention is so vital that even a newborn infant given all the warmth and food it needs, can die without attention. When the brain is injured to the extent that it no longer shows any signs of attending to stimuli, even if the body is capable of life, that life is no longer valued; legally and according to medical ethics, life support can be withdrawn. Attention is invaluable. If we want to know what we truly value, not what we profess to value or wish to value, then we can examine what we give this treasured resource to each day. Attention, attention, attention—life is all about attention.

No wonder our teachers keep telling us to pay attention! And no wonder that ancient methods such as mindfulness

and meditation, which vigorously and methodically exercise and strengthen our attentional abilities and, as research has shown, strengthen the related neurophysiology, are of great interest to all fields that value optimum attentional performance. Mindfulness practices in particular, which have been sanitized of their ancient cultural and spiritual origins (not without loss, according to Edwards, 2011), are incorporated today into everything from peak performance training for military personnel to mindful parenting of children with autism.

As clinicians and researchers in the field of biofeedback and self-regulation skills training, we have unique contributions to make to the exploding field of mindfulness training. I’ve combined mindfulness and biofeedback, especially heart rate variability (HRV) biofeedback, in teaching a wide variety of groups interested in learning mindfulness, including students and educators. By adding the skills learned through biofeedback to mindfulness training, people can learn self-regulation skills that mindfulness training alone doesn’t necessarily offer. One particular skill that stands out is the paced breathing that is used with HRV biofeedback and its associated benefits for decreasing stress and anxiety, improving cognitive performance, increasing autonomic nervous system regulation, decreasing depression, and reducing inflammation. I’m indebted to Paul Lehrer and his group, Richard Gevirtz, Donald Moss, and Inna Khazan, for their research and writing on HRV, biofeedback, and mindfulness. I draw on their works all the time for teaching and in clinical practice. The fall 2015 issue of this publication, *Biofeedback*, is an extraordinary resource in itself for understanding the integration of biofeedback and mindfulness.

The field of education is increasingly integrating mindfulness into training teachers in order to empower them to deal more effectively with the high levels of stress that go with this profession and to incorporate mindfulness practices into the classroom for the benefit of the students. Research on adults maintaining a sustained mindfulness practice show it can enhance attentional and emotional self-regulation and is associated with increased cognitive and

emotional flexibility, which can be significantly beneficial for educators and students (Meiklejohn et al., 2012). Training teachers in mindfulness can increase their sense of well-being and self-efficacy in teaching, increase their ability to manage classroom behavior, and increase their ability to establish and maintain supportive relationships with students (Meiklejohn et al., 2012). Meiklejohn et al. (2012) reviewed 14 studies of programs directly training students in mindfulness and noted objectively measured improvements in working memory, attention, academic skills, social skills, emotional regulation, and self-esteem, as well as self-reported improvements in mood and decreases in anxiety, stress, and fatigue. Matt Leland's (2015) review of the literature on mindfulness in education found positive effects of mindfulness training of students in the areas of critical thinking, focus, test anxiety, test scores, study habits, organizational skills, behavior and self-control, bullying, and attention-deficit hyperactivity disorder. Organizations such as Mindful Schools (mindfulschools.org) have trained thousands of teachers from every state in the United States and more than 60 other countries. These educators, in turn, have taught mindfulness to more than 300,000 students (Berkowitz & Meyers, 2015).

Several years ago, I was hired as a consultant to teach mindfulness and meditation to K–12 teachers attending summer training programs developed by Ilene Smith at the Scarsdale Teachers Institute in Scarsdale, New York. The program was offered each summer for several years, and I was able to teach in them for 6 years. As part of the day-long training that I offered in each session, I reviewed the relevant research on biofeedback, in addition to research on meditation and mindfulness. I also demonstrated the use of HRV biofeedback and showed how helpful it is in supporting the acquisition of the skills required to be mindful of one's breath while deepening relaxation. Educators know that clarity of feedback enhances learning, and as biofeedback practitioners, we have the means to offer training procedures with very clear feedback to optimize learning self-regulation skills. Many of the teachers in the training program had prior experience with mindfulness meditation. They told me that the HRV biofeedback deepened their relaxation and enhanced their practice of mindfulness.

Over the years in my private practice and in teaching mindfulness meditation to individuals and groups, I've observed, as have so many biofeedback professionals, that most people breathe fast and shallow, often at a pace of about 1 to 2 seconds on the inhalation and 1 to 2 seconds on the exhalation. It is as if people go through life like a pack of panting dogs unaware of how triggered their autonomic

nervous system is or how that is shaping their perception of reality as well as their reactions to it. I've had numerous clients who have learned mindfulness techniques and practiced for years before coming to see me. When they perform their mindfulness practice while hooked up to respiration and HRV sensors, they discover how fast and shallow their breathing is, even as they mindfully watch it, not knowing there is a healthier way to breathe. When they learn to slow and deepen their breath using biofeedback or even just biofeedback-informed instruction, they discover that they have the power to further improve self-regulation.

What I mean by biofeedback-informed instruction is simply taking the evidence-based practice of pacing one's abdominal breathing to a rate of five to six breaths per minute, which we know from HRV biofeedback research helps to optimize the benefits of paced breathing. When I'm teaching groups of teachers or students, I discuss the benefits that come from this particular pace and how it relates to resonance frequency. Even though I can't work with each individual to find his or her specific resonance frequency, by hooking one person up to an HRV biofeedback program and projecting it with an LCD projector, everyone in the training group can see what happens when they get into a breathing pattern of 10 to 12 seconds per breath (i.e., 5–6 breaths per minute). By projecting a breathing pacer and having everyone follow the pacer, they all begin to experience what it feels like to come into that frequency of breathing. Children and adults consistently report to me increased relaxation, warming of hands or feet, and a quieter, more relaxed focus. They like having a specific form of breathing to gently focus on, knowing that it is an evidence-based practice with documented health benefits. I've used this type of participatory demonstration in teaching mindfulness to groups of high school swimmers interested in peak performance, educating groups of hospice volunteers, teaching medical students, and conducting other group trainings.

Even without equipment, we can combine mindfulness with this type of paced breathing. I was invited by a local high school to speak to two sophomore English classes because they were reading J. D. Salinger's *The Catcher in the Rye*, and one of the students asked if Holden Caulfield had practiced Buddhism and mindfulness, would he have avoided his difficulties? The teacher had heard of my background in both meditation and biofeedback and asked me if I would speak to each of the classes. I did, and we had lively discussions. Near the end of each class, the students asked me if I could teach them a mindfulness breathing and

relaxation practice that they could do on their own. This wasn't planned ahead of time, but the teacher agreed to it in the moment knowing I wouldn't cross any religious boundaries. Maintaining a secular approach is an important consideration in teaching mindfulness or meditation in schools. I was aware that this school system was especially sensitive to such issues. They had reprimanded a teacher some years earlier because she had brought a yoga teacher in to teach hatha yoga and parents objected to the practices being Hindu-related with Sanskrit names.

I led the students in a simple mindfulness relaxation practice incorporating a paced breathing instruction with eyes closed. They learned to silently and slowly count with the breath: In – 2 – 3 – 4 – 5 – 6 (on the inhalation), Out – 2 – 3 – 4 – 5 – 6 (on the exhalation), gradually letting go with each breath, gently bringing the mind back to the breath and the count whenever it wandered, noticing the gentle heaviness that settles over the body as they let go and let go. . . . Ten minutes later, I brought them out of the breathing exercise, and the students were amazed by how good they felt. They spontaneously asked the teacher if they could do it regularly. One football player was excited by the sense of calm and ease he felt and said he could see how it would help him prepare for big games, whereas several other students enthusiastically said they could use it to prepare for tests.

You never know where or when the opportunities will arise to pass on these skills that we have! The field of education is certainly an area where biofeedback professionals can make significant contributions by connecting with mindfulness in education programs.

It's good to keep in mind the professional and ethical considerations that Sebastian Streifel (2004) enumerated in his article on incorporating mindfulness and meditation practices into one's clinical practice. Of particular importance for offering biofeedback and mindfulness training in educational settings is doing it in the context of stress management and/or peak performance training. This avoids any conflict with these students' or educators' religious beliefs. Streifel also emphasized the need for professional biofeedback providers to possess the requisite training and competencies needed to offer the training they want to provide. Writings on mindfulness abound, and I've met many clinicians, yoga teachers, and mental health professionals who tell me they integrate mindfulness training into what they offer to the individuals or groups they work with. But very often, when I ask them how they were trained in mindfulness and how many years of practice they have done, they answer that they've read some books and did a little in a yoga class. It's one thing to be familiar with the concepts of mindfulness and something quite different

to possess what Streifel referred to as the sophisticated level of knowledge and competence needed for training others.

If you are trained in biofeedback but not mindfulness, you can present the many ways that biofeedback gives an evidence-based method for training the same self-regulations skills that mindfulness training can produce while giving objective measures of progress and skill acquisition not found with mindfulness training. Educators know that clarity and specificity of feedback enhance learning, and biofeedback provides these exceptionally well.

If you are interested in providing programs in your local schools, consider whether you want to focus on educators, students, or both. School superintendents, principals, and local teacher training programs can be contacts for offering enrichment or training programs for educators and for students. School counselors, coaches, and any teachers you may find who have a particular interest in biofeedback, mindfulness, or student stress management programs can be valuable for developing programs for students.

Resources on Mindfulness in Education

Here is a list of organizations with mindfulness in education training programs that may give those interested in opportunities for collaboration in expanding the integration of biofeedback and mindfulness in schools. The organizations' Websites also have valuable online resources, research papers, and training videos.

- Mindful Schools: <http://www.mindfulschools.org/>
- Mindfulness Institute: <http://www.mindfulnessinstitute.ca>
- CARE for Teachers: <http://www.garrisoninstitute.org/contemplation-and-education/care-for-teachers>
- Inner Kids Foundation: <http://www.susankaisergreenland.com/inner-kids.html>

The following books are also valuable resources on mindfulness, education, and biofeedback.

Khazan, I. (2013). *The clinical handbook of biofeedback: A step-by-step guide for training and practice with mindfulness*. Malden, MA: Wiley Blackwell.

Greenland, S. K. (2010). *The mindful child: How to help your kid manage stress and become happier, kinder, and more compassionate*. New York: Atria Books.

Burdick, D. E. (2014). *Mindfulness skills for kids and teens*. Eau Claire, WI: PESI Publishing and Media.

References

- Berkowitz, J., & Myers, A., (2015, July 23) Integrating mindfulness into education. *Education Week*. Retrieved June 25, 2016, from: http://blogs.edweek.org/edweek/leadership_

- 360/2015/07/integrating_mindfulness_into_education.html?intc=mrs&_ga=1.54871017.39085557.1452533202
- Edwards, L. (2011). Biofeedback, meditation, and mindfulness. *Biofeedback*, 39(2), 67–70.
- Leland, M. (2015). Mindfulness and student success. *Journal of Adult Education*, 44(1), 19–24.
- Meiklejohn, J., Phillips, C., Freedman, M. L., Griffin, M. L., Biegel, G., Roach, A., Frank, J., et al. (2012, March 14). Integrating mindfulness training into K-12 education: Fostering the resilience of teachers and students. *Mindfulness*, 3, 291–307. doi:10.1007/s12671-012-0094-5. Retrieved June 25, 2016, from: http://static1.squarespace.com/static/53d81784e4b0e1a63c02846c/t/55b24492e4b09b5e35936c36/1437746322373/Integrating_Mindfulness_Training_Into_K-12_Education.pdf
- Streifel, S. (2004). Ethical issues in meditation. *Biofeedback*, 32(3), 5–7.



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