Grades 6-12

BIOFEEDBACK BREATHING

Rural Opportunity Institute

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Biofeedback Breathing helps students learn how to change their body's conditioned responses to stressful situations so they can improve their self-management and well-being.

OVERVIEW

The biofeedback breathing program by Rural Opportunity Institute (ROI) teaches students how to change their body's conditioned responses to stressful situations in order to improve learning outcomes and interrupt cycles of generational trauma. As a training technique based on research from brain and body science, biofeedback breathing helps students develop the resilience and self-determination they need to live healthy, safe, and connected lives.

Biofeedback breathing is widely utilized by athletes, astronauts, and the military as a training tool to enhance performance and manage stress. By providing real-time physiological response data about Heart Rate Variability (HRV), biofeedback helps regulate breathing patterns, leading to better focus, resilience, and performance. Similarly, students can use biofeedback to improve self-regulation of their emotions and body, which makes it a valuable tool to use to cope with issues like anxiety, ADHD, depression, PTSD, and chronic pain.

Biofeedback breathing has produced positive results in a range of settings by helping people manage the health of their nervous systems. ROI has successfully piloted it in middle schools, county jails, and non-profit organizations, where it proved to be a preventative tool that helped to create a more supportive environment for students. ▸ROI Restorative Biofeedback: Student Testimonials

What Makes This Model Innovative?

Whole-Child Focus

The biofeedback breathing model allows students to effectively manage their responses to cognitive, emotional, social, or physical factors that cause stress in their lives. Biofeedback breathing reduces the impact of these forces on learning and well-being.

Customization

Every student experiences stress differently based on the unique contexts of their lives. The biofeedback breathing model allows each student to understand their own relationship to stress and teaches them how they can manage it with specific tools and techniques.

Active Self-Direction

The biofeedback breathing model enables students to actively manage stress in their lives so that they are better able to focus on learning. It helps them learn to self-regulate and take responsibility for how they engage in school and teaches them skills that will contribute to lifelong success.

DESIGN

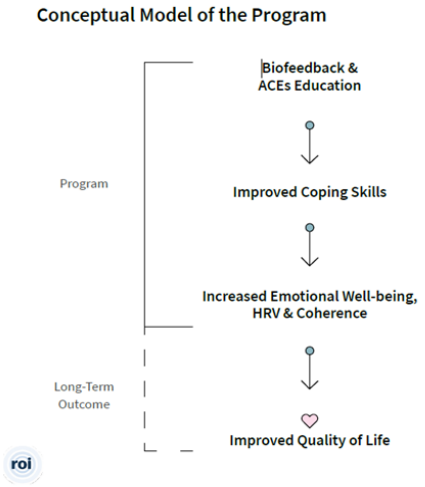
Goals

The core goal of ROI biofeedback breathing work is to help students learn to manage stress and navigate adversity in their lives. ▸ROI Biofeedback Breathing Presentation

Self-Awareness	Students can identify the causes of stress in their lives. They understand how they tend to respond to stress.
Self-Determination	Students know that they have the power to manage their response to stress. They develop an increased sense of control over their minds and bodies.
Improved Coping Skills	Students possess tools to handle stress. They are able to avoid negative coping behaviors.
Increased Emotional Well-Being	Students better understand their emotions. They can regulate them with behavioral awareness.

Experience

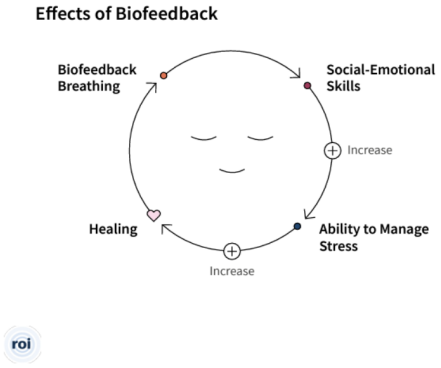
ROI's biofeedback breathing model uses technology to teach students how to train their heart rate variability (HRV), which impacts the autonomic nervous system and is an indicator of physiological and psychological capacity and well-being. In sports science, HRV is used to assess an athlete's training and preparation for performance.



Different from the talk-based interventions typically used in schools, biofeedback breathing helps students learn how to control their HRV, which, in turn, helps them control how their emotions impact their body and behavior. The model is based on research about how to mitigate the impact of adverse childhood experiences (ACEs) and stress on learning.

Biofeedback

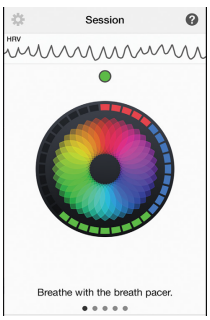
Students who opt into the program use HeartMath Inner Balance Trainer technology to monitor their HRV as a part of practicing biofeedback. The technology itself is a small, wearable sensor that clips to an earlobe and measures heart rhythm. This information is then sent to the HeartMath Inner Balance mobile app, which provides visual, real-time feedback on HRV. This feedback helps students learn how to understand and control their HRV, which is a measure of how evenly a heart beats in relation to signals it receives from the nervous system.



Over time, students learn to use biofeedback to shift stress and frustration into balance and resilience using breathing exercises and meditation. The goal is for students to use biofeedback to achieve coherence, which is a physiological state when breathing, heart rhythms, and brain rhythms are in sync with each other. Coherence promotes overall well-being for students both in the near term in school as well as long term in the future because they have learned stress management tools and skills. 🖥️ What is Heart Coherence?

Breathing Exercises

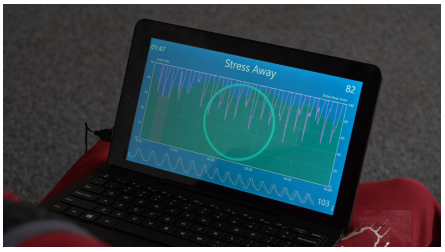
The primary tool within the biofeedback breathing model is mindful breathing. Students use the Inner Balance app to track their biofeedback and learn specific breathing techniques and meditations. As students practice biofeedback, the Inner Balance app uses color-coded visual cues to guide students through their breathing to get the most out of exercises. This gamification helps students maintain engagement. For example, in one exercise, a multicolored circle expands and contracts, signaling when to inhale and exhale respectively. The goal



is for students to keep the indicator light green, which means they are breathing at the proper cadence. If the light turns blue or red, the student needs to refocus their mind and body to enter a calmer state of mind and turn the light green again.

Students participate in at least one 10–15 minute session per day, ideally twice a day for 5–8 minutes, over a 4–6 week span. Sessions can be scheduled whenever it is convenient but would ideally take place at the beginning and end of the school day. In later stages of the program, students practice without devices to help them further develop self-regulation skills. At the end of a session, students may also choose to follow a guided meditation to further their practice. 📑ROI Breathing Techniques

Data Reporting



Once students conclude a biofeedback session, they are prompted to describe their mood using the Inner Balance visual scale. This is a simple process in which students tap the emoji that reflects their current mood. This data is synced with other information to provide students with a progress report as they move through the program. 🖥️HeartMath Inner Balance Mood Selection

Students receive real-time feedback during sessions, but they also receive progress reports that help them build growth mindsets and celebrate their successes. Progress reports based on data from their sessions help them track the relationship between their moods, their breathing, and the state of their parasympathetic nervous system. Depending on the level of investment from the program coordinator in terms of time and from the school or district in terms of technology, progress monitoring can be either simple or complex. Schools determine who sees progress reports besides students. ROI only collects anonymized data. 📑Sample HRV Report 📑How to Read HRV Assessments

Supporting Structures

The biofeedback breathing model can be incorporated into any existing school design with the purchase of equipment and some basic accommodations regarding scheduling and space.

ROI's biofeedback breathing model is easy to incorporate into any curriculum but is best when implemented with an SEL curriculum.

The biofeedback breathing model is compatible with any curriculum. When adopting the model, students must first be introduced to the science behind biofeedback and how it can counteract the negative impact of trauma on learning. Students should also receive education around Adverse Childhood Experiences (ACEs) as a source of trauma that makes self-regulation and executive functioning difficult.

CURRICULUM, INSTRUCTION, & ASSESSMENT

Understanding the basic principles of a trauma-informed approach to teaching and learning will bolster the positive effects of the biofeedback breathing model. Ideally, the model will be paired with social-emotional learning curriculum that provides additional support for students. The only instructional requirement is the use of technology that measures HRV. ROI uses HeartMath Inner Balance technology. If a school does not yet have a SEL program, ROI offers some somatic tools as a starting point. 🖥️ROI Resilience Cards

ADULT ROLES, HIRING, & LEARNING

At least one staff member is needed to manage ROI's biofeedback breathing model.

Although ROI's biofeedback breathing model consists of several elements, one staff member could manage all of them as a part of their workload. Every staff member who helps to run the program must receive educational training in ACEs to understand the impact of stress and trauma on the body and brain. They must also learn how to use HeartMath Inner Balance technology, how to manage student data, and how to enroll students in the program.

One person can take on more than one specific role in the program. Roles to be played within the biofeedback breathing model include:

- Program Champion(s): advocates for the program
- Program Recruiter: finds and enrolls eligible students in the program
- Program Coordinator: oversees all aspects of program implementation
- Data Manager: documents participation, stores data, and maintains student privacy

SCHEDULE & USE OF TIME

The biofeedback breathing model requires students to practice for at least 15 minutes every day for a minimum of four weeks.

Schools adopting the biofeedback breathing model must provide at least 15 minutes in their daily schedule for students to participate in the program. Although students will benefit from one 10-minute biofeedback breathing practice session per day, the ideal is for students to participate twice a day. And although the program typically yields results after 4 weeks, the ideal is for the program to run for 6 weeks.

Schools must provide the program with a quiet, private space where students can practice biofeedback breathing each day.

When practicing biofeedback breathing, students must be allowed to utilize a dedicated space that will give them privacy and allow them to focus on

SPACE & FACILITIES

their breathing without distraction. Program staff must clearly communicate procedures for the use of this space.

TECHNOLOGY & INFRASTRUCTURE

The biofeedback breathing model requires the use of an Inner Balance training sensor that must be connected to the HeartMath app.

The model requires the use of specific equipment and software to monitor HRV and teach students how to regulate it. ROI uses HeartMath but other types of equipment are available. 🖥️HeartMath Inner Balance Sensors

BUDGET & OPERATIONS

A budget must be in place to purchase the technology needed to run the biofeedback breathing model.

Individual HeartMath Inner Balance Trainers cost approximately $199 per unit. This technology runs on an app that is compatible with both Android and Apple devices.

IMPLEMENTATION

Supports Offered

ROI offers the following supports to help you implement their approach to biofeedback breathing.

ROI Biofeedback Implementation Guide
Free

A step-by-step guide explaining how to implement ROI's biofeedback breathing model.

Access Now

ROI Trauma & Resilience Training
Cost Associated

ROI offers resources to help schools start biofeedback breathing programs and build resilience, including basic consulting or professional development.

Learn More

HeartMath Training and Certifications
Cost Associated

HeartMath, a manufacturer of the biofeedback technology used by ROI, offers a variety of curriculum, guidance, materials, and support.

Learn More

Reach

11	300+	50+	94%
Schools & Organizations	Students	Educators	Students of Color

Impact

In a 2019 pilot, 12 middle school students who were frequently disciplined for behavior challenges reported that biofeedback breathing helped them regulate their emotional state.

- 100% of students reported increases in their ability to calm down after using biofeedback.
- 57% reported a decrease in anxiety symptoms after using biofeedback.

Young people readily engage in biofeedback breathing because its positive impact is tangible.

- "I was amazed by how quickly our guys got into it. They seemed to enjoy doing biofeedback. I saw it change how they felt." –Head of detention center
- "Biofeedback was simple, and my students loved getting the space and time to do the breathing practice daily." –Middle school teacher
- "The benefits of this program are immense. Students and staff learn self-regulation strategies and communication is improved." –Middle school teacher

Contact

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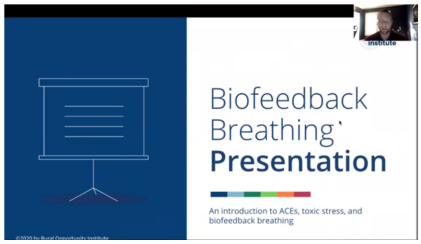
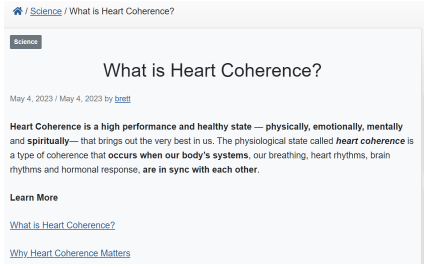
RESOURCES

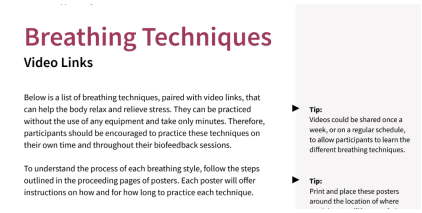
[ROI Restorative Biofeedback: Student Testimonials]
Interviews of students who have learned biofeedback breathing.



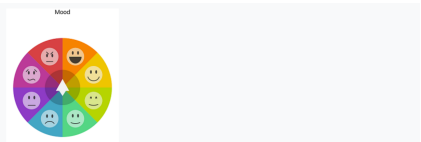
[ROI Biofeedback Breathing Presentation]
A video explaining ROI's biofeedback breathing model.



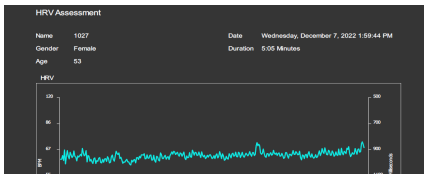
[What is Heart Coherence?]
A webpage that explains heart coherence.



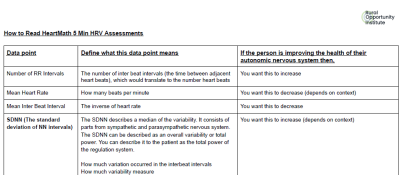
[ROI Breathing Techniques]
A document that describes several different breathing techniques used by ROI.



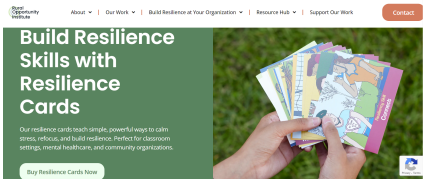
[HeartMath Inner Balance Mood Selection]
A webpage explaining the process of mood selection in the HeartMath app, Inner Balance.



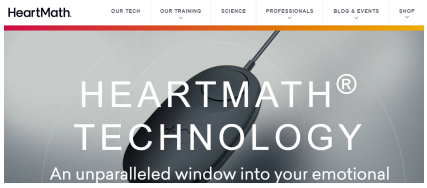
[Sample HRV Report]
A sample HRV Report, which shows the different measures that comprise heart rate variability.



[How to Read HRV Assessments]
A document explaining how to read an HRV Report.



[ROI Resilience Cards]
A website that explains ROI Resilience cards.



[HeartMath Inner Balance Sensors]
A website about the specific technology used in the biofeedback breathing model.

[Rural Opportunity Institute]
Rural Opportunity Institute's website.