

BfB Labs Trials Summary

The BfB Labs team has run five trials of our game over the last 2 ½ years, with groups of between 10 and 90 young players aged 10-15, which have demonstrated that our games effectively train players to manage their emotional state through diaphragmatic breathing.

Our most recent, and largest trial was at The Billericay School, Essex in 2016

The trial was conducted to investigate the effectiveness of the game in training emotional regulation skills through regulated diaphragmatic breathing, as well as measure levels of enjoyment and stickiness. The trial was a Randomised Control Trial in which we randomly selected 90 pupils from Year 7 who came out of lessons once a week to play the game for 1 hour a week for 6 weeks. The other 200 students in the year, who didn't play the game, acted as our control group. We collected live heart rate and gameplay data whilst students played the game, as well as conducting surveys and focus groups before and after the trial.

Results

- Fundamental to the game's design and effectiveness is that it teaches players to regulate their emotional state by encouraging them to regularly practice diaphragmatic breathing. Within the trial, players spent an average of 26 minutes per play session focusing on this key behaviour of breathing, which equates to 55% of the time spent playing the game.
- In the trial participants were able to regulate their emotions whilst playing the game, with over 4 in 5 participants reliably doubling their heart rate variability, spending 40% of focused breathing time over this threshold.¹ This was supported by the survey results in which 3 in 4 participants reported getting better at staying calm and focused within the game.
- As well as having a beneficial effect whilst playing the game, it also teaches the player a skill they can use to stay relaxed and focused outside of the game in times of pressure. 1 in 4 participants reported they had already started applying these techniques outside of the game by the end of the trial.
- This was the first time the participants had experienced Emotionally Responsive Gaming, and they reported that it enhanced the game element, making it more fun and engaging as it involved them in the game-play like no other game they had played. 2 in 3 of the participants would have recommended the game to a friend.

¹ Heart rate, and therefore Heart Rate Variability (HRV), response to diaphragmatic breathing but also to emotions, with stress causing a high heart rate and a low HRV. Thus, HRV reflects both the player's breathing, and their emotional state and can be used as a proxy for emotional regulation and responsiveness.

Earlier trials

Class Trial at St Angela's Ursuline School, Newham, 2016

We conducted a trial with 30 randomly selected Year 8 girls (13 years old) at St Angela's Ursuline School in Newham to explore impact of, and engagement in, the game. The selected girls played the game once a week for seven weeks. We collected live heart rate and gameplay data whilst students played the game, as well as conducting surveys and focus groups after the trial. Findings included 3 in 4 players getting better at staying calm and focused within the game and 1 in 3 reporting they had already started applying these techniques outside of the game by the end of the trial.

Freestyle-Play Trial, King's College School, Wimbledon, 2016

In this trial five pupils aged 14 - 15 years old took the game home during the Easter holiday and were asked to play the game twice a week for 10 minutes in order to explore player engagement within their own time, outside of the classroom context. The gameplay data showed that the participants played for an average of 40 minutes a week, double the requested amount, with one participant playing over 4 hours of the game across the 4 weeks.

Class Trials, Morningside and Queensbridge Primary schools, Hackney, 2015

These trials were run to explore the impact and enjoyment of the game on younger school pupils (aged 9 - 11) as well as to investigate the ways the game could be integrated into a school setting. In Morningside School the

game was played by a Year 5 and Year 6 class for 20 minutes, three times a week for four weeks during class time. In Queensbridge, a small group of Year 5 pupils were taken out of class to play the game for the same amount of time. The game was enjoyed, with 3 in 4 saying they would recommend it to a friend and over 80% of pupils feeling they had improved their breathing technique. It was also noted by one teacher that the game was particularly enjoyed by some of the students that struggled with behaviour and routine. The trial also demonstrated the advantages and disadvantages of smaller vs whole class interventions.

Volunteer Trial, The Billericay School, 2014

This, the first trial of our biofeedback game concept, was run to explore thoughts around ERG, engagement in the game and impact of the game. Thirty boys in Year 8 (aged 13) volunteered to play the game daily for five minutes. We found overwhelming support for the ERG concept from both students, staff and parents with a fifth of the boys giving up their lunchtime break to continue playing the game past the 5 minute requirement. There was also evidence that the game had highlighted the link between the physical response stress can have, and how to counter this through diaphragmatic breathing, with some students already using the breathing technique outside of the game. For more detailed findings please see the report on this trial on [Shift's Website](#).