

The Learning Counterintuitive Concepts project aimed to improve science and maths attainment for Year 3 and Year 5 pupils (aged 7-10) using an intervention called Stop and Think. When learning new concepts in science and maths, pupils must be able to inhibit prior contradictory knowledge and misconceptions to acquire new knowledge successfully. Stop and Think is a computer-assisted learning activity that aims to improve learner's ability to adapt to counterintuitive concepts by training them to inhibit their initial response and instead, give a more slower and more reflective answer. The intervention was developed by the team at the joint Birkbeck College and UCL-Institute of Education's Centre for Educational Neuroscience and it was co-funded by The Wellcome Trust and the EEF.

This project was a randomised controlled trial. Eighty nine schools were randomly allocated to have either Year 3 or Year 5 as their intervention year receiving Stop and Think, with the other Year group acting as one of the two control groups. Half of the control years were business as usual who continued with normal classroom practice, and half received a computer programme to support social/emotional skills, as an active control condition. This meant that we could measure specific effects of the Stop and Think intervention beyond additional engagement and motivation caused by the novelty of playing a computer game. The primary outcomes were maths and science attainments and the project also looked at a general measure of inhibitory control as a secondary outcome.

Key Findings

- Children in the intervention group made the equivalent of one additional month progress in maths and two additional months' progress in science, on average, compared to children in the control group. The maths result is not statistically significant. This means that the statistical evidence does not meet the threshold set by the evaluator to conclude that the true impact was non-zero. These results have a high security rating.
- The use of two primary outcomes increases the risk that a false positive result may be found through chance. The mixed results between the two outcomes mean that the evaluator is unable to conclude that the programme is effective at raising attainment outcomes.
- The project found no evidence that the Stop and Think programme had an impact on pupils' general inhibitory control.
- A majority of teachers thought that Stop and Think had a positive impact on the mathematical and science abilities of the pupils in their class. Other impacts of using the programme included pupils taking time to consider their response before answering questions, enhanced confidence and improving engagement in learning.
- The majority of teachers did not endorse the roll out of the programme in its current form to other schools. The most common reasons given were the difficulty in fitting delivery into the school day, software problems, pupil engagement, the accuracy of content, quality of animation and some of the content being too easy.