

‘Brain-training’... or learning as we like to call it

The Catholic Education Office in Sydney has recently announced that it will be offering the controversial Arrowsmith Program to children with learning difficulties from next year, on a trial basis. Arrowsmith is a Canadian-based program that claims to overcome learning difficulties through a series of exercises that train the brain and improve its capacity to learn.

Arrowsmith is one of a number of ‘brain-training’ programs currently on the market, along with others such as Brain Gym (www.braingym.org) and DORE (www.dore.co.uk). Intuitively, what they offer is very appealing to parents and teachers of children with learning difficulties. Instead of targeting treatment on the specific symptoms of, say, a reading difficulty (e.g. poor phonics), they claim that they can stimulate or reorganise a child’s brain so that it works better, faster, and more efficiently. The improved learning capacity that this produces will then alleviate the symptoms of the specific difficulty the child is having.

The first point to note here is that the term ‘brain-training’ is somewhat of a tautology, since all learning happens in the brain. As one of our colleagues is known to say: “it certainly doesn’t happen in your big toe”. Any intervention that is given to any child, will, in some way, “train their brain”. So the question here is not should we train children’s brains, but how should we train their brains? More specifically, how are different kinds of learning difficulties best treated?

Let’s look at the concepts that underlie many brain-training



programs and see what insights they might provide here. The first concept often cited is that, like the body, the brain needs to be exercised in order to function optimally. In Arrowsmith’s words, their program can be “thought of as a type of mental work out for the brain” in which “underfunctioning areas are treated like weak muscles and are intensely stimulated through cognitive exercises” (www.arrowsmithschool.org/arrowsmithprogram-background/methodology.html).

This is rather an odd idea when we think about what the brain is doing all the time. At any moment, our brains are receiving, analysing and responding to millions of stimuli. Reading the paper, walking down the street, seeing a movie, chatting to a friend - all of these involve an enormous number of complex neural processes. The brain is hardly sitting on the couch, watching TV and eating chips! Indeed, it could be said that the brain is working out pretty hard every waking (and even

sleeping) moment. So this concept, on its own, does not help inform us about how to treat learning difficulties.

The second concept underlying many brain-training programs, including Arrowsmith, is that of ‘neuroplasticity’. This idea stems from research in basic neuroscience that has shown that parts of the brain designed for one function can adapt to perform new ones. The way that the brain adapts depends on how it is stimulated. So, neuroplasticity tells us that the brain can adapt, but it does not tell us how the brain should be stimulated (or trained). Thus, neuroplasticity per se also does not inform us about how to treat learning difficulties.

Despite this, programs that claim to be based on neuroplasticity have strong opinions about how this should be done. For example, Arrowsmith states that it “identifies, intervenes and strengthens the weak cognitive capacities that affect learning. Students are able to capitalise on their increased

learning capacities and after a three or four year program can function without special education assistance or program accommodations”, and that this “has proven effective for students having difficulty with reading, writing and mathematics, comprehension, logical reasoning, problem solving, visual and auditory memory, non-verbal learning, attention, processing speed and dyslexia”.

The effect of Arrowsmith on skills such as reading and writing has never been tested in a randomised control trial, and so there is no direct evidence for this claim. But what about indirect evidence? Our analysis of the available evidence on reading difficulties is that children

make the largest gains in literacy from programs that target training directly on literacy skills. Programs that attempt to improve literacy by targeting training on skills that are presumed to underpin reading, such as auditory processing or kinesthesia, are less effective. Similarly, programs that aim to improve multiple skills at the same time – reading, maths, attention, memory, problem solving – tend to be less effective than programs that focus just on trying to improve reading.

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