



## Research Summary

Since 1997 there have been more than 20 research studies involving some 700 students looking into the effectiveness of the Arrowsmith Program. There are another four research projects currently underway at three universities.

Among these studies are two published peer reviewed research papers, both from University of British Columbia: the 2019 Neuroimaging and Behavioral study and the 2017 study into Individuals with Acquired Brain Injury.

All these independent studies are by different investigators, in different schools and academic institutions, using different research frameworks.

Significantly they all show the same or very similar results— that the Arrowsmith Program is effective for students with learning difficulties resulting in significant improvement in:

- cognitive abilities critical for learning—including long-term memory, verbal-auditory learning, inductive reasoning, processing speed, verbal fluency and vigilance – a form of sustained attention; and
- academic results, with the biggest changes occurring in word reading, reading fluency, spelling, maths fluency and computation.

## The Arrowsmith Process

Most programs designed to help children with learning difficulties identify weaknesses, teach to strengths and tailor content to suit abilities. They measure results in terms of improved academic performance.

Arrowsmith works differently. By using cognitive programs, the goal is to target the brain itself getting it to work where it hasn't been working effectively.

The Program uses repetitive exercises that work the brain like a muscle in the gym, focusing on those core cognitive abilities that underpin literacy and numeracy, as well as a host of emotional intelligence and practical everyday competencies.

## About The Arrowsmith Program

- Founded in 1978 by Barbara Arrowsmith-Young, who herself suffered severe learning difficulties for many years
- 90 Arrowsmith Program sites worldwide, including in Canada, the United States, Australia, New Zealand, Thailand, Malaysia, South Korea, Spain, the Cayman Islands and Switzerland
- More than 10,000 students world-wide have achieved success with the Arrowsmith Program
- The Arrowsmith Program launched in Australia in 2013, it is currently offered in 19 schools across WA, NSW, Qld, SA and Victoria, more than 1,100 Australian students helped

# List of Research undertaken into the Arrowsmith Program since 1997

## Research into Academic Outcomes

- 1998 Results of Arrowsmith Program at St. Patrick's Secondary School - Toronto Catholic District School Board (Canada)
- 2000 Treatment Outcome for a Motor Symbol Sequencing Dysfunction (Canada)
- 2000 Evaluation of the Implementation of Arrowsmith in the TCDSB - Toronto Catholic District School Board (Canada)
- 2003 Arrowsmith Program Evaluation Report – UBC & Vancouver School Board
- 2003 Report on the TCDSB Study of the Arrowsmith Program - Toronto Catholic District School Board (Canada)
- 2004 TCDSB Learning Disabilities Review - Toronto Catholic District School Board (Canada)
- 2005 Outcome Evaluation of the Arrowsmith Program – Donner Foundation (Canada)
- 2007 Rate of Learning - Toronto Catholic District School Board (Canada)
- 2007 Academic and Learning Behaviours - Toronto Catholic District School Board (Canada)
- 2013 A Case Study of Learning Disabilities – University of Saskatchewan (Canada)
- 2014 Academic Achievement - University of Calgary (Canada)
- 2015 Average Academic Growth - Holy Trinity Parish Schools (Australia)
- 2016 Written Proficiency - Motor Symbol Sequencing Whole Cohort Study (Australia)
- 2016 Academic Achievement - University of British Columbia (Canada)
- 2017/18 Academic Achievement - University of Southern Illinois (United States)

## Research into Cognitive Outcomes

- 2004 TCDSB Learning Disabilities Review - Toronto Catholic District School Board (Canada)
- 2005 Outcome Evaluation of the Arrowsmith Program – Donner Foundation (Canada)
- 2013 A Case Study of Learning Disabilities – University of Saskatchewan (Canada)
- 2014 Cognitive Outcomes - University of Calgary (Canada)
- 2016 Cognitive Outcomes - University of British Columbia (Canada)
- 2016 Cognitive Outcomes - Universidad Camilo José Cela (Spain)
- 2017/18 Cognitive Outcomes - University of Southern Illinois (United States)
- 2018 Cognitive Outcomes - University of Southern Illinois (United States)
- 2019 Cognitive Outcomes - University of Southern Illinois (United States)

## Research into Social, Emotional and Behavioural Outcomes

- 2007 Social, Emotional and Behavioural Outcomes - Toronto Catholic District School Board (Canada)
- 2016 Social, Emotional and Behavioural Outcomes - University of British Columbia (Canada)
- 2017 Social, Emotional and Behavioural Outcomes – University British Columbia (Canada)

## Brain Imaging Outcomes

- 2016 Efficiency of Processing - University of British Columbia (Canada)
- 2016 Activation of the Prefrontal Cortex - University of British Columbia (Canada)

## Brain Imaging Outcomes (continued)

- 2016 Connectivity Within and Between Brain Networks – Southern Illinois University (USA)
- 2016 Connectivity Changes - Southern Illinois University (United States)
- 2018 Connectivity Changes - Southern Illinois University (United States)
- 2017 Individuals with Acquired Brain Injury - University of British Columbia

## Other Research:

- 1997 Correlates of a Test of Motor Symbol Sequencing – University of Toronto (Canada)

## Research Results

The research results from these studies demonstrate that for individuals with learning disabilities, Arrowsmith's cognitive programs lead to changes in:

- brain activation and connectivity
- cognitive functioning
- academic achievement
- rate of learning in the acquisition of academic skills
- social emotional well-being
- activities of daily living
- growth mindset (seeing one as an agent of change in one's life)
- stress levels (as measured by reduction in cortisol)

For individuals with Traumatic Brain Injury, Arrowsmith's cognitive programs lead to changes in:

- brain activation and connectivity
- cognitive functioning
- social emotional well-being
- successful return to work

For elementary aged students without learning disabilities, Arrowsmith's cognitive programs lead to changes in:

- cognitive functioning
- academic achievement

## Global Research Initiative

In February 2019, a research collaborative was formed comprised of researchers from the University of British Columbia, Southern Illinois University, Universidad Camilo José Cela, and Tallinn University.

The researchers are meeting on a regular basis to collaborate on further research investigations into the outcomes of students in the Arrowsmith Program. Arrowsmith's vision is to create a research institute to further these investigations in the fields of learning disabilities, cognitive enhancement, education and acquired brain injury.

## Arrowsmith Research Updates

For updates on the research being conducted on the Arrowsmith Program, visit the Research page on the [Arrowsmith website](#).