

## The Intervention:

“Picture your brain forming new connections as you meet the challenge and learn. Keep on going.”

~Dweck

-- The **intervention** is actually the teaching of how the brain grows in intelligence. This intervention, or understanding, is the key to teaching and developing a growth mindset. The ideal starting place for students is to teach them how the brain works and responds to learning, and how to use strategies to learn.<sup>32</sup> It is this information that empowers students in their learning. Greater student motivation comes directly from seeing their learning situation as one where they have the power and potential to develop their abilities.<sup>33</sup>

--The **intervention** increases students' beliefs about the malleability of intelligence, which then impacts their motivation to learn since they feel empowered. This ultimately increases their academic achievement. This knowledge sets up a cycle that begins with understanding one's brain and the power one has over their brain and learning, students feel empowered and so put in the effort required to learn and thus grow their brains (a behavioral change). This results in learning and academic achievement, which leads to increased motivation and so increased learning, and thus the cycle of achievement continues.<sup>34</sup> One's beliefs are a self-fulfilling prophecy.<sup>35</sup>

--**Teaching the scientific facts** about the malleability of the brain, to show how intelligence can be developed, is meant to increase student desire to take on challenges and to enhance their persistence, it is designed to prevent a fixed mindset in times of struggle or setback.<sup>36</sup> Students must understand that connections in the brain will be changed and strengthened through repetition and practice.<sup>37</sup> They must have a clear understanding of what the differences are between a growth and fixed mindset, so they realize the impact their internal dialog/thinking, choices, and behaviors can have on their learning.

<sup>32</sup> Dweck, 2006

<sup>33</sup> Blazer, 2011

<sup>34</sup> Esparza, 2015

<sup>35</sup> Yeager et al, 2016

<sup>36</sup> Dweck, 2006

<sup>37</sup> You Can Grow Your Intelligence, 2016

## The Brain:

--The brain is like a muscle, it changes and gets stronger just like a muscle does. When you practice and learn new things, parts of your brain change, grow, and get stronger much like muscles do when you exercise.<sup>38</sup>

--Inside the cerebral cortex of the brain are billions of tiny nerve cells called neurons. These neurons have branches, or dendrites, that connect them to each other. This connection allows the brain cells to communicate and that is what allows us to think and solve problems.<sup>39</sup>

--The more you learn, the more connections you make, and the stronger old connections become. So, the more you challenge yourself, the more your brain cells grow; the resulting stronger, smarter brain makes once difficult tasks seem easy. Learning causes permanent and positive changes in the brain—this scientific knowledge empowers students, they realize they are in control of their learning, they are "driving their brains!"<sup>40</sup>

"Critical reasoning opportunities...serve as a great neural workout.  
All students must have daily opportunities to think critically."  
~Mary Cay Ricci

## How the Intervention Works/Resources:

A great **Dweck resource** for learning more about the growth mindset is:

[www.mindsetworks.com](http://www.mindsetworks.com)

--Under the link "The Science," at the top of the page, you will find an amazing lesson plan (may require adaptation depending on the grade level you teach) to use with your students, to teach them how the brain works and how they can grow their intelligence, to empower them.

Or the direct link is:

<https://www.mindsetworks.com/Science/Default>

--Half way down the page click on:

*Download the lesson plan used in this intervention*

<sup>38</sup> Dweck, 2006

<sup>39</sup> Mindset Works, 2016

<sup>40</sup> Wilson and Conyers, 2016

Another resource to further explore the brain and what each section does is:

Open Colleges Website/Interactive 3-D Brain Map

<https://www.opencolleges.edu.au/informed/learning-strategies/>

--Dweck repeatedly found, in **30 plus years of research**, that when students, regardless of age, grade, or school, were taught how their brains formed new connections whenever they learned, and how they became smarter, they naturally felt and thus acted empowered. They were excited and motivated by the fact that they could influence and drive their own brains; they had control over their future learning or lack thereof. Those receiving this message outperformed the control group in every study she conducted, even if the control group received training in study skills. Students reported greater investment in learning and teachers noticed changes in students' desire to work and learn. <sup>41</sup>

**An added benefit:**

\*\*\*The effects of stereotypes were even shown to be reduced when students believed that their abilities could be developed. And behavioral problems decreased as well! <sup>42</sup>

**Important:**

--It is **your responsibility to follow up** with further learning and reinforcement after the intervention, or it will quickly fade from a student's mind like any other learning that lacks meaning and practice. Thus, teachers with a stronger belief in growth mindset and better follow-through strategies can have a greater positive impact on their students, which has lasting effects. <sup>43</sup>

--Students must understand that fast learning is not best; **learning takes time and intentional effort; it is a process accomplished overtime.** <sup>44</sup> Sometimes when students take longer they understand things at a deeper level. Albert Einstein was a slow learner and he believed it was the pondering of the same questions for such a long time that made him the genius people know him as. <sup>45</sup>

<sup>41</sup> Dweck, 2007

<sup>42</sup> Dweck, 2007

<sup>43</sup> Esparza et al, 2014

<sup>44</sup> Miller, 2013

<sup>45</sup> Dweck, 2010

--Intelligence should not be defined by I.Q. or by the grades one gets, but rather as "the ability to view difficulty as an opportunity to stop, reassess, and employ strategies to make sense of problems."<sup>46</sup> Smart is not something you are, but rather something you can become, it is a choice and *that* is empowering!

--Learning must be seen as active, self-directed, self-controlled, goal-directed, stimulating, enjoyable, as a lifelong process, and as a natural human process. It is a productive and essential human activity if we are to grow.<sup>47</sup> Ultimately, education needs to be seen as a necessary activity that gives learners more control over the direction their lives will take, not just what happens in the classroom. Students may not *love* doing all they have to do, but they can value it as a means toward their life goals! So, when students say, "Why do I have to do this? I will never use it," you can remind them that everything they learn is making the connections in their brains stronger and thus making them smarter, more capable, and better prepared for life!

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<sup>46</sup> Miller, 2013, p. 51

<sup>47</sup> Reynolds, 2006