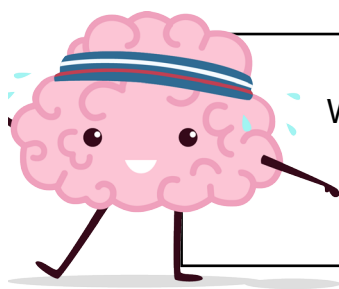


# NeuroScience and Learning

## AN OVERVIEW OF THE ESSENTIAL TERMS



- **Neuroscience:** the scientific study of the nervous system. It is an interdisciplinary science that collaborates with other fields such as engineering, mathematics, cognitive science and also education.
- **Educational neuroscience:** (or Neuroeducation, a component of Mind Brain and Education): an evolving scientific field that connects researchers e.g. in developmental cognitive neuroscience, educational psychology, educational technology, education theory and other related disciplines to analyze the **interactions between biological processes and education.**
- **Experience-Dependent Plasticity:** the continuing process of the creation and organization of neuron connections that occurs as a result of a person's life experiences.
- **Differing life situations** and circumstance influence how certain areas of the brain develop and continue to grow. Research has shown that violinists and Braille readers have an increased cortical development in the section of the brain that corresponded to the fingers of the left hand (which is used predominantly when playing the violin or reading Braille).



### **Learning is physical!**

When you learn something, the wiring in your brain changes. By acquiring information the structure of our neurons physically alters.

- Our **brains** act like a **muscle** >> The more activity you do, the larger and more complex it can become.

### **John Medina's brain rules:**

1. The various regions of our brains develop at different rates in different people
2. No two people's brains store the same information in the same way and place
3. A great number of ways of being intelligent don't show up on IQ tests

# References

Brain Waves Module 2: Neuroscience: implications for education and lifelong learning, The Royal Society, 2011

Medina, John: Brain Rules: 12 Principles for Surviving and Thriving at Work, Home, and School, 2009

# Additional Resources

Daniela Kaufer: What can Neuroscience Research Teach Us about Teaching?

London Taxi Drivers and Bus Drivers: A Structural MRI and Neuropsychological Analysis

The Maritz Institute White Paper: The Neuroscience of Learning: A New Paradigm for Corporate Education, 2010

PageUp People White Paper, The Neuroscience of learning and development

# Videos

Vimeo channel of HarvardX Neuroscience

All in the mind? The role of neuroscience in education - learning world