Thought Paper:

Neuroscience and Informed Educators

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Having a concrete understanding of neural processes involved in learning and remembering empowers teachers within their profession. Many teachers lack training in neural science, yet it is not contested that education and neuroscience are linked (Coch, D., Ansari, D., 2009). A domain specific understanding of how the brain changes with learning allows educators to tailor lessons to support the acquisition of content and facilitate structural modifications, associated with expertise, within the brain through the application of neuroscience theories.

Zamarian, Ischebeck, and Delazer (2009) highlight the transition from manually calculating basic mathematical facts to quick and efficient retrieval of the facts. The process of initially manually calculating facts serves to build the conceptual knowledge necessary to create meaning and transfer information from STM to LTM. With conceptual knowledge in place, one can apply concentrated training and adequate time, in order to shift areas of brain activation to reflect the move from focused calculation to automatic retrieval, thus freeing working memory to manipulate new information. Having a concrete understanding of this process, one can effectively evaluate the methods, timing, and content of courses. For example, NorQuest College offers an option to complete Essential Math (Grades 2-6) and Pre-Algebra (Grades 7-8) in one term. In order to complete both sections, Essential Math must be completed in just weeks. This goes against the notion of time and training being necessary to achieve expertise of basic facts (Zamarian, Ischebeck, and Delazer, 2009). Without this mastery of the foundations, the ability to succeed going forth is diminished. This is reflected in the success rate of students taking this path, which is much lower compared to those taking only Essential Math or only Pre-Algebra. Now, the college is going back on this idea of double blocking the two courses. A path that could have been avoided had an understanding of neuroscience been present at the onset.

References

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