



Teaching Math Classically with Andrew Elizalde

Lesson 5: Mathematics, Memory, and Retained Learning

Outline:

Mathematics, Memory, and Retained Learning

- *What are the arts of memory we have inherited in the Classical Christian education tradition?*

The Arts of Memory

- The Memory Palace and how it works
 - As our mind is a web of associations, we can consciously increase the associations of different facts to make recall stronger. This includes -
 - Associating facts with physical locations in the mind (I.e.: a library)
 - Placing the fact in a striking, unusual visual
 - Pieces of information that are associated with visuals, locations and physical experiences are easier to remember. The more real, the more memorable
 - The more we can associate one thing with others, the more memorable it is
 - Information that has no contextual relationship can still be associated and be memorable
 - E.g.: Moonwalking with Einstein
 - While the way the facts are presented need not have a logical relationship to the fact, it should properly convey and reinforce the concept.
 - E.g.: A fanciful story that reinforces the properties of fractions in a memorable way

Practical Applications

- Thus, we can increase ability to retain mathematical facts by making sure these facts are learned in a context that includes images, movements or songs. The more that they can associate, the better, and the more these visuals reinforce the concept, the better.
 - We should establish computational proficiency through experiences that have visualizations, manipulatives and experiences that reinforce conceptual understanding.
 - Memorization through understanding and association takes more time than to simply teach a method or formula, but walking students through these concepts is a worthwhile investment.



- E.g: Walking students through the steps of long division and fraction division, explaining every step before showing the simplified formula
- Take your time to make sure the students have a conceptual understanding.
- Appreciate the simplified, efficient algorithm, but ensure your students know the path to this algorithm and why it is this way.
- We do not want students who remember facts but do not understand the basic concepts and grammar of mathematics.

Why is this important?

- Our ultimate goal is not to create students good at doing math problems, but to turn students into critical thinkers and problem solvers.
 - We are teaching students concepts that they will learn to extend and continually draw upon, and perhaps more importantly, how to learn these concepts.
 - Through this, we not only give our students a strong foundation to draw upon, they learn to –
 - Appreciate the journey to the answers
 - Associate concepts with images to make persuasive arguments
 - Present arguments visually, orally or using notations