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# Number Talks Effect on Working Memory

Corvette Berthold | MTH 412 | Spring 2020 | Western Oregon

## Number Talks

Number Talks are a short guided educational method where students engage in meaningful conversations centered around interesting mathematical or numerical problems that are aimed at building number sense and flexibility.

Integrating Number Talks into class three times a week can be helpful for students dealing with certain disabilities and anxiety.

The Key components of number talks include:

- \* Low stress, safe environment
- \* Problems with multiple solution paths
- \* Individual think time
- \* Discussion with peers
- \* Mistakes valued



## Research

Studies by Peterman et al., Sun et al., & Webb have shown that the inclusion of Number Talks will help with the development of the students' working memory, especially with information transitioning from working memory to long-term memory. They strongly suggest that as a student comes to feel more comfortable with a certain concept, it will be easier for them to retrieve the information from their long-term memory.

## Fully Inclusive Classes

The primary issue students undertake when dealing with a disability and or fight with anxiety, is the way their working memory affects their mathematical reasoning. Students dealing with Math Anxiety, Dyslexia, Dyscalculia, Attention Deficit Hyperactivity Disorder (ADHD), and Traumatic Brain Injury (TBI) all have visible proof when scanned, of a deficiency in the prefrontal cortex which produces the task-relevant stimuli for the working memory.

## A Safe Learning Environment

Teachers should want to facilitate a comforting classroom environment that allows students to speak freely and without the fear of being belittled or disrespected if they make a numerical mistake or if they have a misconception of a mathematical concept. This helps with their self-confidence in their mathematical cognitive abilities. Students also are more likely to retain the numerical concept by having these deep discussions defending their reasoning.

## Promoting Rich Numerical Peer Discussion



## It's Not Always About Math

Number talks calm the mind, making mathematics have a lower stress impact on the prefrontal cortex, which is necessary so students can compute or figure out anything of a mathematical nature. Aspects of this teaching model can also be used in other parts of our teaching, not just in a numerical nature. For example, this would be a great method of instruction for those students learning a new language. Given the time to problem solve promotes linguistic flexibility without making the students feel judged or insecure in their reasoning.

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