**Building Computational Fluency Webinar - Guided Notes & Questions**

November 19th, 2020 - Presented by Dr. Witzel, Dr. Myers, and Ms. Brooke Atwood

Link to webinar recording: <https://www.ksdetasn.org/resources/2902>

**Identifying the Need for Computational Fluency**

1. According to the Nation’s Report Card only \_\_\_% of 8th grade students are at or above proficient in mathematics.
2. According to the Nation’s Report Card the national average for students performing below basic in mathematics increased from 18% in 4th grade to\_\_\_\_% in 8th grade, while in reading the percentage actually decreased from 31% in 4th grade to \_\_\_\_% in 8th grade. What does this mean?
3. According to a 2014 study, preschool numerical understanding and early grade growth predicts math achievement through age \_\_\_\_.
4. According to a 2010 study, completion of \_\_\_\_\_\_\_\_\_\_\_\_\_ predicts college and technical school completion.
5. How does the use of calculators impact computational fluency?
6. How does lack of proficiency with computation affect students’ cognitive load when attempting complex tasks?

**Defining Computational Fluency**

1. What are the five strands of mathematical proficiency?
2. Procedural fluency includes skills in carrying out procedures \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Stages of computational fluency development:
	1. Understanding \_\_\_\_\_\_\_\_\_\_ concepts
	2. \_\_\_\_\_\_\_\_\_\_\_ use of strategies
	3. \_\_\_\_\_\_\_\_\_\_\_ / \_\_\_\_\_\_\_\_\_\_\_\_ of facts
4. What does it mean for a student to have Automaticity?
5. According to the IES practice guide, what should be the focus for daily fluency practice for each grade band below?
	1. K-5:
	2. 4-8:
	3. 9-12:

**Strategies for Whole & Rational Number Fluency**

1. When students are working towards **understanding** key concepts, an evidence-based instructional practice involving multiple representations is CVA:
	1. C =
	2. V =
	3. A =
2. What are some examples of concrete manipulatives? How have you OR how could you use those when working towards students’ understanding of key concepts?
3. What are some examples of visual representations? How have you OR how could you use those when working towards students’ understanding of key concepts?
4. How did the Addition Fluency Building Strategies compare to how you’ve previously taught addition facts? How could subtraction be embedded in these as well?
5. How did the Multiplication Fluency Building Strategies compare to how you’ve previously taught multiplication facts? How could division be embedded in these as well?
6. What happens when we don’t attend to fluency in lower grades?
7. Reflect on the scope and sequence of multiplication for Kindergarten through 6th grade. What do you notice?
8. When is speed practice appropriate?
9. How might we use worksheets in a more impactful way?
10. What would it look like to implement incremental rehearsal in your classroom for the facts relevant to your students?
11. What else might we use in our classroom besides the Hundreds Table Accomodation to scaffold and fade support as students master skills?
12. How could we scale fluency work to upper grades beyond 3rd grade, and into high school?

**Generalization (Embedded Fluency)**

1. Generalization - Students’ ability to perform targeted skill under \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_conditions.
2. Three dimensions of Generalization:
	1. Stimulus
	2. \_\_\_\_\_\_\_\_\_\_
	3. Time
3. What is an example of embedded fluency? What would this look like in your classroom?
4. What can you do if students are not on grade level with their fluency skills?

**Next Steps**

1. Who else in your building would benefit from seeing this webinar?
2. How might you collaborate with your grade level team to bring a daily focus to computational fluency?
3. What students in your class right now are on your mind? What could you commit to trying with those students over the next 2-3 weeks? How can you track their progress and evaluate the impact?