Impacting Second Grade Student Achievement in Mathematics with AIM4S^3 Implementation

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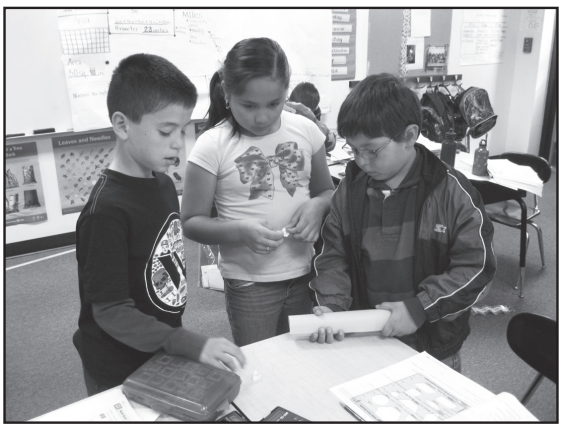
As a fourth year teacher in Deming, New Mexico, I was delighted to attend the Achievement Inspired Mathematics for Scaffolding Student Success (AIM4S$^{3™}$) training last January. Since the implementation of the model in my second grade classroom, I have seen an overwhelmingly positive impact on student achievement.

This past school year was challenging for our school's staff. Everyday Mathematics (EDM) was newly implemented, and I essentially relied on the teacher's edition to guide my instruction, since I was not familiar with the program. I often felt that I was not reaching all of the students, even though I was using the provided curriculum supports. I used the readiness activities for the struggling students, which included most of the English learners (ELs), and the challenge activities for students performing above grade level. Even so, the students were not excelling as I anticipated. This was the most discouraging time for me as a teacher.



Students work on a focus piece for a measurement unit with the unit compendium in the background.

I was eager to attend the AIM4S$^{3™}$ training since I was reflective in my practice and knew that my knowledge of our math program was not benefitting my students. After the training, I began implementing the model and the key instructional principles with fidelity. The week before each new unit, I did my homework, carefully studying the unit. I focused on backward planning, studying the end-of-the-unit assessment, and how the curriculum addressed the content. I pulled out key concepts, including visual models, algorithms, word problems, and content-specific vocabulary and language that would make my second graders successful. The key instructional principles for AIM4S$^{3™}$ are teacher Mechanics and Delivery, Student Output, Positive Classroom Culture, and Sheltering and Scaffolding strategies.

As a Guided Language Acquisition Design (GLAD) trained teacher, I felt very comfortable with the latter two categories. I had to focus on Teacher Mechanics and Delivery and Student Output, two critical features of the model. My biggest challenge lay in making time to study the units before teaching them. I focused on planning how to use the methods and strategies, the information to put on the compendium, and ensuring that students had time to process the information.

Prior to implementation, I taught six units from the second grade EDM curriculum. After the training, I began collecting data on the implementation of the AIM4S$^{3™}$ model in my classroom and taught six additional units. The first six unit assessments served as my baseline data. I used a 100-point scale for assessments.

My second grade class had 21 students, seven of whom were female. There were four ELs, one special needs student, and one gifted student. Prior to AIM4S$^{3™}$, the class average fell between 70% and 88% (see Fig. 1). My goal was that the class average be 80% or higher. The class met this goal twice during the first six units.

As my second graders began this journey with me, they showed a considerable amount of growth in a short time. In February, the students took their first assessment since the model was implemented. I watched them answer questions, eager to see the results. I saw students singing chants used to teach key concepts and academic vocabulary. "Go median, middle number," I heard one student sing. She then answered the question with a smile on her face. I knew I was going to be happy with the results from that day's assessment.

That night I went through all of the assessments. The class average improved more than a letter grade! On the previous assessment for Unit 6, the class average was 71% (see Fig. 1); for Unit 7, it was 82%. If this doesn't make a teacher jump for joy, I do not know what does!

Another of my favorite success stories from last year took place during the second assessment after implementation. One particular student was an English learner who also struggled with long-term memory issues and was behind in all subjects by

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more than a year. On the Unit 7 assessment, he earned an 18%. On the second assessment after implementing AIM4S$^{3™}$, Unit 8, he earned a 98%!

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12
70	76	84	77	88	71	82	91	85	81	80	89

Fig. 1 Assessment averages before and after AIM4S^3 implementation

As he completed the assessment, he said excitedly, "I know this. I know all this!" That unit was his first success in mathematics this school year. I knew that his excitement was building as I watched him progress through the unit and play EDM Fraction Card games with me. I worked with him one-on-one to develop the language that he needed to be successful, and his language got stronger as I modeled the frames.

In this game, after looking at the cards, one of the partners states whether the fraction is greater than, less than, or equivalent to the other player's card. For example, a correct student response could be, "One-half is greater than one-third." This student would point to the "greater than" card and say "That one." I began modeling the language frame when it was my turn. Each time he used the frame correctly, I would reinforce him, saying, "Way to go ... You knew exactly what to say when you looked at the cards!" He was soon playing the game better than most of the other students. What amounted to about 15 minutes of my day changed his perspective on the difficulty of the math games!

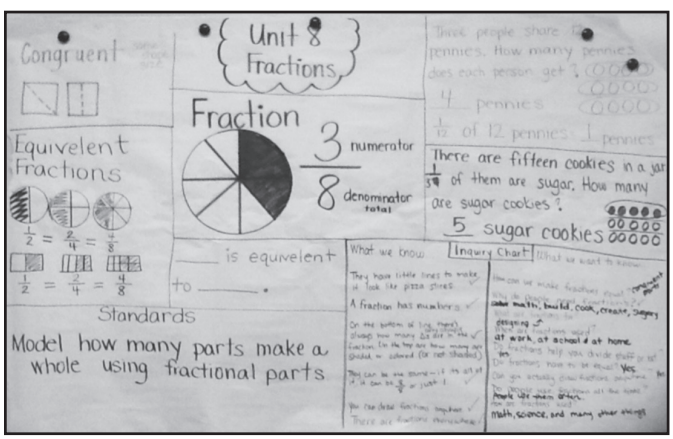

Fig. 2 Compendium: EDM, Grade 2, Unit 8—Fractions

When he got his assessment back with a 98%, he screamed, "I got an A!" The second graders immediately began clapping and cheering, and I knew the AIM4S$^{3™}$ training had already paid off! I really think something changed internally for this student during Unit 8. The concept was fractions, and the compendium for this unit was very useful for him (see Fig. 2).

Each time the student worked independently, he would look at the compendium to see what resources he could use to complete his work. I used a visual model of the concept showing a circle divided into eighths and then shaded in three-eighths to model how fractions work. Thinking about the big picture, I added the numeral representation, 3/8, and the words "numerator" and "denominator." Underneath denominator, I added the word "total" to help differentiate the two numbers.

When I asked him what helped him the most on the compendium, he responded, "the fraction in the middle," affirming the use of visual models. Most importantly, this student found something that he was successful doing and his eagerness for mathematics expanded. Volunteering for every opportunity to share his thinking continued through the school year, and he sustained his success on the unit assessments.

This child's experience helped rekindle the meaning of why I chose to teach elementary students. I believe that using this model for mathematics helped me understand the vision for the EDM curriculum and gave me the necessary sheltering strategies to teach the content to mastery. Figure 1 shows that after implementing the AIM4S$^{3™}$ model, the class average was between 80 and 89 on all math assessments. This approximate 10-point difference helped me see that all the work of backward planning and compendium development was very valuable to my second graders.

Before implementing the AIM4S$^{3™}$ model, I was always just trying to stay afloat with all of the curriculum changes and concerned with what was coming up next. This year, I learned the importance of devoting a large amount of my planning time to looking at the big picture, not just a daily chunk. In addition, I spent time working on the most meaningful piece of my instruction, the compendium. Frontloading was not something I learned in college or prior to the AIM4S$^{3™}$ model. This year, I saw it support the success of the entire class, especially my English learners.

As you plan for the upcoming year, remember the good that you are doing for all students, especially ELs. You will see the powerful impact of the AIM4S$^{3™}$ model on student achievement and remember that your time and energy are benefitting the students in your class.

For more information about AIM4S$^{3™}$, please visit www.AIM4Scubed.dlenm.org.