

Using the Scientific Method to Increase Student Learning
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Last summer I was disappointed with our school's end-of-year test scores. It was our first year as a brand new school in a newly developed community, with new desks, chairs, carpet, fixtures, bookshelves, books, teachers, staff and friends. Before our school opened in the fall of 2021, I dragged my administrative assistant along and we went door-to-door in our new community introducing ourselves to the people who would answer their doors (we were on a lot of doorbell cameras) and inviting them to be part of our school community. It was out of my comfort zone and honestly it scared me to death but it turned out to be a great experience that continues to pay dividends to me and to our school. We had a great year complete with the usual challenges but our test scores were disappointing. I came from a school that will always have high test scores due to their demographics so this was a bit of a shock.

In his book *The Principal: Three Keys to Maximizing Impact*, Michael Fullan states, "There is more to accountability than measuring results; you need also to develop people's capacity to achieve the results" (2014, p. 27).

I spent last summer meeting with educational leaders I admired and asked a lot of questions about how to increase student learning at my school. One of those people was Bryce Eardley who I was assigned to mentor. I think it's funny that I am his mentor because although he was new to our district, he has been an administrator at multiple levels a lot longer than I have been. We talked about what we could do to increase student learning in our buildings and he told me how he wanted to use the scientific method in his opening meetings including purchasing lab coats for his staff. I ran with the idea. Thank you Bryce!

I arranged for our faculty to meet at the new fire station near our school so I could get the teachers to concentrate and not be worried about getting into their classrooms. I ordered lab coats for each teacher, bought some beakers with curly straws, stuffed test tubes with candy, bought scientific method gift bags and decorated the fire station with scientific method posters, tablecloths and related artwork. We had a box breakfast and got started. I used a Slides Carnival template for the scientific method to create a presentation with all of the information, activities, and group work I wanted to take place. We started with some get-to-know-you activities and then dived in. I wanted to motivate them so I showed the Youtube video called

Know your Why/Michael Jr. and shared this excerpt from *The Culture Code* by Daniel Coyle (2018, p.184-185).

In a study by Harvard psychologist Robert Rosenthal from 1965, he approached a California public elementary school and offered to test the school's students with a newly developed intelligence-identification tool, called the Harvard Test of Inflected Acquisition, which could accurately predict which children would excel academically in the coming year. The school naturally agreed, and the test was administered to the entire student body. A few weeks later, teachers were provided with the names of the children (about 20 percent of the student body) who had tested as high-potentials. These particular children, the teachers were informed, were special. Though they might not have performed well in the past, the test indicated that they possessed "unusual potential for intellectual growth." (The students were not informed of the test results.) The following year Rosenthal returned to measure how the high-potential students had performed. Exactly as the test had predicted, the first- and second-grade high-potentials had succeeded to a remarkable degree: The first-graders gained 27 IQ points (versus 12 points for the rest of the class); and the second-graders gained 17 points (versus 7 points). In addition, the high-potentials thrived in ways that went beyond measurement. They were described by their teachers as being more curious, happier, better adjusted, and more likely to experience success as adults. What's more, the teachers reported that they had enjoyed teaching that year more than any year in the past. Here is the twist: the Harvard Test of Inflected Acquisition was complete baloney. In fact, the "high-potentials" had been selected at random. The real subject of the test was not the students but the narratives that drive the relationship between the teachers and the students.

Then I introduced the...Scientific method: (noun) a method of procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of [hypotheses](#). (Oxford Languages).

We used it to do a full trial run with Oreos - observing the many varieties, measuring and experimenting with them, forming a hypothesis and taste testing them to see which was the best Oreo. I then asked the faculty to use the scientific method to observe, measure & experiment with their prior year's data, then form a hypothesis which included "If I do this... then this will happen." Here are some examples:

"If I am more intentional with my time, planning and tier 1 instruction, student learning will increase."

"If I provide opportunities for repetition for students learning letter names and sounds, they will learn them by November 1."

"If I pull small groups for focused interventions based on assessment data, they will improve their performance on the power standards."

"If I have my students do a fluency practice every day and try to beat their previous score, they will increase their reading fluency."

"If I train my students to come in from recess and read silently for ten minutes, then I can progress monitor two students every day."

"If I have students set their own gutsy-goals and take charge of their own learning, they will make the necessary growth for their grade level."

"If I create kid-friendly learning scales for each power standard, students will know the target for each standard and work to achieve it."

Each team then set goals for the year based on their data and our experiment began. Each month at faculty meetings I wore my lab coat to remind them of our experiment.

We accomplished several goals in the first term, so we met and set more goals two more times during the year. Most goals were met, but a few still need some work next year. In the end, we did find that for the most part, our hypotheses worked. Most of our year-end Acadience and Rise data is encouraging but one grade level really struggled with Rise so we will back up and figure out what needs to happen next year.

I am proud of the growth our students made on EOY Acadience testing. Our district's goal for grades K-3 was that 60% of students will show typical or better growth at EOY Acadience. Of our 17 classes in K-3, three did not make the goal. When studying this data it is good to dig in a little deeper because data doesn't always tell the whole story. For example, one kindergarten class only had 45% growth. That is because those students started out high at BOY and only two students were below proficient and below typical growth at EOY. So it is important to look deep, ask questions and really find out what the data is telling us.

Percentage of students making typical or better growth on EOY Acadience

Grade	Class 1	Class 2	Class 3	Class 4	Class 5
K	64% (half-day)	78% (half-day)	92% (all day)	45% (half-day)	
1st	70%	77%	68%	67%	
2nd	91%	71%	62%	36%	81%
3rd	81%	59%	82%	86%	

4th	75%	100%	86%	100%	
5th	48%	88%	78%		
6th	96%	89%	93%		

At our UAESP Winter Conference, Todd Whitaker said, “We can’t tell teachers to increase test scores; we must teach them how.” Our scientific experiment helped them discover for themselves how to increase student learning. I had teachers in (happy) tears when they saw their student results. They have bought into the fact that all students can learn, including our large population of refugee students who are learning a new language and how to navigate a new culture.

I want my school to be a great place for students to succeed. Jim Collins said, “Good is the enemy of great. And that is one of the key reasons why we have so little that becomes great. We don’t have great schools, principally because we have good schools. We don’t have great government, principally because we have good government. Few people attain great lives, in large part because it is just so easy to settle for a good life” (2001, p.1).

On the last day of school we had a huge celebration and danced around the gym to celebrate our success. Are we done? No!! We are good but we have a long way to go to become great. I am so grateful that in my job I can examine my practice, take a break, buy a new backpack and some new shoes and come back and try again next year!

References

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Fullan, M (2014). *The principal: Three keys to maximizing impact*. San Francisco, CA: Jossey-Bass.

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