

PURPOSE / PROBLEM

There is a problem in the district. This problem is not unique to Clay County. It is a national problem. I became aware of this problem when I was an adjunct professor at University of North Florida teaching Math Methods for Elementary Teachers. I would give a pretest at the start of the semester. The pretest was an end of fourth grade assessment. I noticed that my students, juniors in college, could not successfully pass this test. When I moved to the district office, as a curriculum specialist, I noticed similar patterns in mathematics when I was in classrooms.

Elementary teacher content knowledge in mathematics is often weak. Teachers often lack a deep conceptual understanding of the content that they are teaching. They also often lack an understanding of how the foundational concepts build and are vertically aligned. This leads to the impartment of misconception in student understanding of critical content.

As students move through the grade levels, deep rooted misconceptions cause gaps in learning to occur. Frequently, these misconceptions build, without being remediated because secondary teachers do not always know how to undue the misconceptions and get to the root of the misconception, which may be as early as place value and number sense.

These gaps and misconceptions compound, and the result of this shows when students reach Algebra I. Students who take Algebra I in junior high have a high pass rate on the EOC, however, the pass rate for students who take Algebra I in their freshman year is not as good. Below are the EOC results for the 2016 Spring Administration:

Grade Level	Percent Proficient (L3+)	Total Number of Students Assessed
7	99%	119
8	98%	542
9	51%	2,083
10	24%	33
11	50%	16
2016 All Grades	62%	2,794

I would direct your attention to the ninth-grade data, highlighted above. Most students in the district take the assessment in the ninth grade, and the pass rate is just 51%. The overall district pass rate is 62%, compared to the state pass rate of 55%, but the high pass rate of the accelerated students falsely raises confidence in the district's overall performance. Therefore, it is important to address factors that may contribute to the fact that about half of our ninth-grade students do not initially pass the Algebra I EOC. Foundational gaps are known to contribute to this problem.

Further, on the monthly mathematics curriculum conference call with the Florida Department of Education, we were advised that Florida finished last in the United States on the most recent TIMSS assessment in areas of mathematics.

DECISION STATEMENT

INTEL Math Professional Development is a national program that provides 80-hours of content professional development for K-8 teachers. The program is taught collaboratively by a math education/practitioner (formerly Kim Verrilli, now Elizabeth Scheilz) and a mathematician who possesses a minimum of a master's degree in applied mathematics (William Veszko, Professor, St. Johns River State College, Former Clay County High School Teacher). All trainers are selected and approved by application with the national INTEL program and are trained by the Intel Foundation and the University of Arizona to deliver this content with fidelity. The trainers are observed by the program director from INTEL a minimum of once per year. Those trained have the elite status of being National Consultants for the program.

The program is centered around a problem-solving approach, and works on closing the gaps between the inadequate training that elementary teachers receive in mathematics and the rigor of math standards by closing gaps in content knowledge from number sense and place value through the content student need prior to entering algebra. This link will take you to the brochure for INTEL Math:

http://ime.math.arizona.edu/intelmath/intelmath_brochure.pdf

Elementary teacher content knowledge is proven be low in Clay County. The district has implemented cohorts of the INTEL Math Professional Development Program previously. There is a pretest/posttest given to assess teacher content knowledge at the beginning and end of the program. Cohorts of a maximum of 30 teachers enroll in the professional development. Clay County data is provided below by cohort for the teacher pre/post assessment:

	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Cohort 5
Pretest	60.4%	58.0%	52.49%	51.23	47.16
Posttest	78.0%	79.5%	75.64%	76.96	In Progress
Growth	+29%	+37%	+44%	+51%	TBD

As shown above, the growth in teacher content knowledge from the professional development is substantial. The growth in teacher content knowledge has led to a greater sense of teacher self-efficacy towards teaching mathematics, as well as strong student results as measured by the FCAT 2.0 and the FSA. Student data and teacher growth data by strand will be provided upon request.

BACKGROUND / DISCUSSION / RESEARCH

To begin to solve this problem, it is important to assure that teachers are given adequate training to bring their content knowledge up to the highest possible levels. The body of literature has demonstrated that one-shot 3-hour workshops around a single concept do not impact teacher practice or student achievement. Ideally, INTEL trained teachers should receive the opportunity to participate in ongoing, job-embedded professional development, such as lesson study and teamed professional learning communities working with student data and standards. In many cases, teachers have participated in follow up such as that described above after the training.

Additionally, there is a body of research that shows that nature of the problem with mathematical content knowledge across the country. Some of the supporting articles from peer reviewed journals are listed below. These are just a few and I would be happy to provide more.

The question has been raised as to why Ms. Scheilz is contracted at a rate of \$100/hour for days that she provides this professional development that are outside of her contracted days. When Ms. Scheilz is under contract with the district, she performs the professional development as part of her assigned duties.

To minimize the number of days that the teachers are out of the classroom to attend this training, we have scheduled a blended model of substitute days and days that are not student contact or contracted days. On days when Ms. Scheilz is not under contract, she is working for us in the capacity of a national consultant. On the attached brochure, there is a recommended budget for the program.

INTEL suggests that the instructors each be compensated in the amount of \$10,000 for providing the 80 hours of training. This is a rate of \$125.00 per hour. Considering that only three days for the upcoming cohort are on days that are outside of her contracted days, \$2,400 dollars in a small amount of what the district would have to pay to bring in another trained INTEL consultant to provide this critical training. Additionally, the documented rate from the brochure is the old rate.

INTEL has also increased the recommended rate for instructors who provide this program. It is fair and reasonable to compensate her at this reduced rate when she is taking her own time to provide service to develop our teachers. Additionally, the actual amount of time that she puts in on those days, between preparation, set-up, and review at the end of the day, far exceeds the 6 hours per day that she provides us under this contract.

References:

- Garet, M., Heppen, J. Walters, K., Parkinson, J. Smith, T. Song, M. Garet, R., Yang, R., & Borman, G. (2016). Focusing on teachers' mathematical content knowledge: Impact of content-intensive professional development. (NCEE 2016-4010). Washington, DC: *National Center for Educational Evaluation and Regional Assistance, Institute of Education Sciences*, U.S. Department of Education
- Hill, H.C., Schilling, S.G., & Loewenberg Ball, D. (2004). Developing measures of teachers' mathematics knowledge for teaching. *The Elementary School Journal*.105(1) 11-30.doi: 10.015.0002505.00
- Loewenberg Ball, D., Hill, H.C., & Bass, H. (2005). Knowing mathematics for teaching: Who knows mathematics well enough to teach third grade, and how can we decide? *American Educator*. 29(1), p.14-17, 20-22, 43.46. Retrieved from <http://www.aft.org/sites/default/files/periodicals/BallF05.pdf>

ALTERNATIVES

There are no alternative PD programs that have provided the results that this program has for teachers and students.

FUNDING

All costs associated with this cohort of INTEL Math Professional Development are fully funded by the DoDEA grants. This program was written into several of the grants due to the high level of growth obtained, and is reported as a measurable outcome in our annual reports to the funder.

RECOMMENDATION

Secure Superintendent's signature

COORDINATION

Who has signed off and/or reviewed this document?

Signature_____

Signature_____

Date: _____

Date: _____