

Exploring Differentiation With Middle School Teachers

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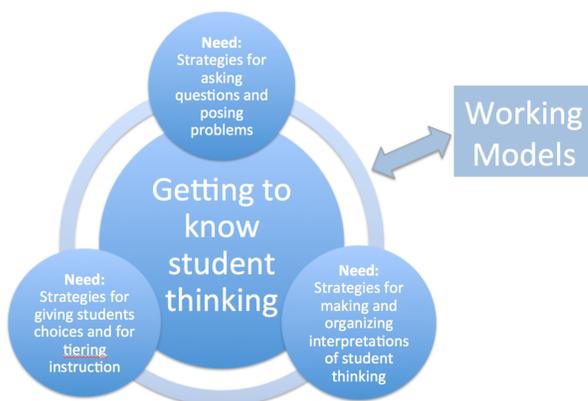
PURPOSE

- The purpose of Differentiated instruction (DI): to meet the needs of a diverse student body while maintaining classroom cohesion.
- The need for DI training: it is unusual to find DI in middle school mathematics classrooms (Gamoran & Weinstein, 1998) despite the diverse mathematical needs of middle school students.
- The goals of the Teacher Study Group: to study how teachers understand and implement DI.

To that end we present here our preliminary findings from a collaborative project to investigate DI with a group of middle school mathematics teachers.

THEORY OF DI INSTRUCTION

We define DI as the proactive tailoring of instruction to meet student needs without sacrificing classroom cohesion. This proactive tailoring involves the following elements (Hackenberg, Creager, Eker & Lee, 2016):



THE IDR²eAM PROJECT

Investigating **D**ifferentiated Instruction and **R**elationships between **R**ational Number Knowledge and **A**lgebraic Reasoning in **M**iddle School

- 5 years; currently in Year 5: www.indiana.edu/~idream
- The Teacher Study Group met during Year 3 of the project.

Purposes:

- To investigate how to differentiate mathematics instruction in middle school for students with diverse cognitive characteristics
- To understand relationships between students' rational number knowledge and algebraic reasoning
- To build a community of educators committed to exploring how to differentiate mathematics instruction for middle school students

THE TEACHER STUDY GROUP

The Teacher Study Group (TSG): a year-long partnership with 15 middle-school math teachers across the state of Indiana.

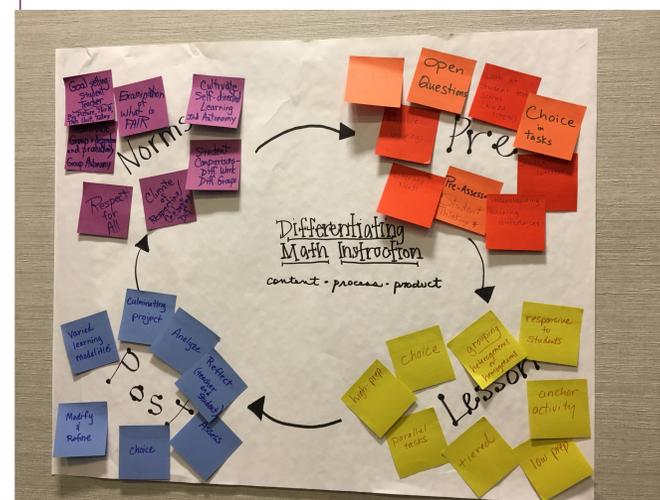
Participants completed three required components:

- **A 3-day initial workshop (July, 2015) to:**
 - explore their own mathematical reasoning
 - consider mathematical reasoning of middle school students,
 - learn more about DI, and
 - begin planning lessons and assessments to gather information about the reasoning of students in their classes.
- **Monthly meetings:**
 - 2 hours after school once a month, online
 - shared results from 'homework assignments'
 - analyzed student thinking, considered their own mathematical reasoning, read articles, develop differentiated lessons for their own classes, etc.
- **Final sharing (June, 2016):**
 - one day, in person meeting
 - shared results from teaching DI units
 - offered final reflections on DI.

DATA

Data for this analysis included:

- Survey responses from TSG members, completed before the first meeting.
- Reflections written throughout the year as TSG members completed various 'homework' assignments.
- Responses to reflection questions after the last monthly meeting.



FINDINGS – DI

DI involves more than superficial changes, but these changes can be small.

TSG members thinking transformed from:

- DI as a way to “close the achievement gap” through tasks at different levels or of different types.
- DI as a set of activities rather than a mindset
- DI as wholesale change

By the end they saw DI as:

- Cyclical: gathering and responding to information about student reasoning.
- Focused: keep your eyes on the mathematics
- Incremental: build up from current classroom structure

“Start small and change your idea of what it means to differentiate.”

FINDINGS – STUDENT THINKING

Student thinking is foundational to DI, but attending to that thinking is not a trivial task:

- Initially, only 2 TSG members described nuanced assessment of student thinking as central to DI. The others assumed:
 - students would be able to do the same work if it was only presented in a different format,
 - all students were in different places on a path well known to the teacher (“struggling”/ “grade level” / “accelerated” students),
 - the goal of assessing student thinking was to figure out a starting point along that path, not to learn something new about the nature of students' mathematical reasoning.
- Final TSG reflections revealed a deeper commitment to listening to students:
 - “Always reflect on what you're doing and what your students know and how they are thinking.”
 - “Differentiation involves...spending much more time digging into why my students are answering something the way they are.”

REFERENCES

Available as a handout, and at www.indiana.edu/~idream

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