

Co-Teaching and Math Discourse to Support Students and Teachers in Linguistically Diverse Elementary Classrooms

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INTRODUCTION

- There are cognitive advantages to speaking more than one language; yet, linguistic diversity can impact teaching and learning in complex ways (Moschkovich, 2005).
- All students are expected to develop rigorous understanding of content and math practices (CCSSO & NGA Center, 2010).
- English learners (ELs) need opportunities to participate in rich math activities and discussion that take into account their competencies and also provide necessary support.
- We need to consider *innovative educational ideas* for supporting rich math instruction for ELs (and all students).

CO-TEACHING

- Co-teaching, where both teachers assume the responsibility of planning and implementing instruction (Bacharach, Heck & Dahlberg, 2010), may provide innovation for increasing teacher confidence and flexibility in responding to student needs.

"People have this idea of what co-teaching looks like, but they don't realize all the different ways – all the different models it can look [like]. It has to be what's best for you ..."



"... co-teaching dynamics is really about how to engage with someone else because classrooms are kind of like a bedroom. It's kind of our private space—public spaces for kids and teaching—but I just think at the end of the day, teachers become very protective of their own space. And I think that this [co-teaching] allows for practice in the area of engaging with another adult about best practices in the classroom with kids."

METHODS

- **OVERVIEW:** Ongoing, small-scale study investigates how supported, co-teaching practices may enhance engagement with math discourse in linguistically diverse elementary school classrooms.
- **PARTICIPANTS:** 7 co-teaching teams: one experienced teacher & one master's intern (post-student teaching). Professional development (PD) and ongoing collaborative support in co-teaching and math discourse.
- **DATA:** field notes and video and audio recordings (PD and math lessons), co-teaching team reflections, and classroom artifacts. Data collection and qualitative analysis (Creswell, 1998) are ongoing.

CO-TEACHING APPROACHES

(Bacharach, Heck & Dahlberg, 2010)

Approach	Diagram	Explanation
One Teach, One Observe		One teacher teaches while the other strategically observes and collects purposeful data. Co-teachers share and analyze observational data afterwards
One Teach, One Assist		One teacher has the primary responsibility for teaching; the other teacher moves around the classroom helping individuals and/or "voicing" student perceptions and questions.
Parallel Teaching		Co-teachers plan jointly but split the classroom in half to teach the same content at the same time. (Teaching may be done in different languages.)
Station Teaching		Co-teachers share responsibility for planning & teaching. The classroom is divided into teaching centers. Co-teachers are at particular stations; other stations are run independently by the students or by another adult.
Alternative (Differentiated) Teaching		One teacher manages most of the class; the other teacher works with a small group. This strategy can be used to provide additional challenge as well as support.
Team Teaching		Co-teachers are responsible for planning, instruction, and classroom management of all students. Lessons are taught by both teachers who actively engage in conversation to encourage student discussion.

MATH DISCOURSE

(Chapin, O'Connor & Anderson, 2009)

- **Revoicing** – The teacher restates some or all of what a student has said and verifies if it was accurate
- **Repeating/Restating** – A student is asked to restate someone else's idea or reasoning
- **Reasoning** – Students are asked to apply their own reasoning to someone else's reasoning
- **Adding On** – Students are prompted for further participation
- **Waiting** – Providing wait time or "think time"

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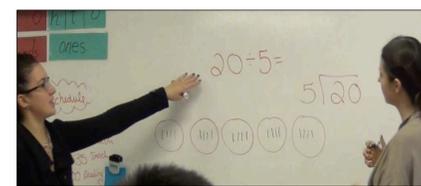
CO-TEACHERS' REFLECTIONS ...



"We don't want them to just give us an answer. We really focus on **how did you get to that answer?** And so, **developing how students can ask each other** how they got to that answer. Or, if they didn't get to that answer, can you please tell me how do you ... I don't understand... can you show me your way? **And just having them be able to take it and explain it is ultimately what you want the students to do. That was something that we could model ...**"

"... This year especially us working together, has really helped the kids soar. They've gotten things that they haven't in the past. There's a **deeper understanding of concepts** for sure... We have a new curriculum this year and its very involved and just having both of us together to split the kids up or do **more modeling or observing of one another** has just been very helpful."

~HA, K Co-teacher~

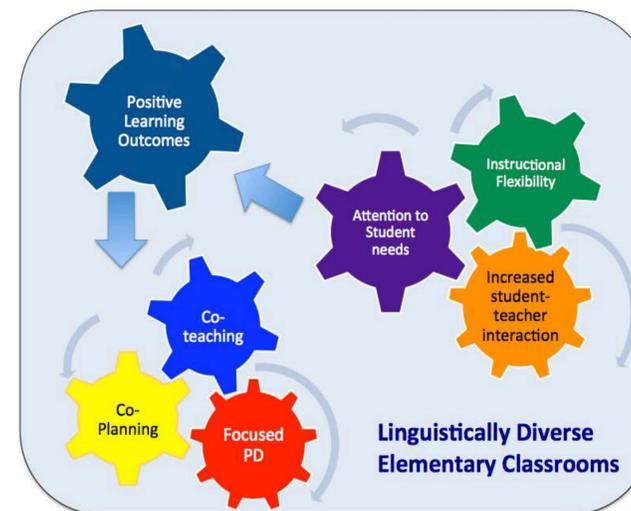


"Our big push this year was **academic vocabulary**. Math is its own language. And, luckily, a lot of the math terms can be found in both **English and Spanish**, which is ... great for our kids. But, ultimately, they're learning a third language, **the language of math.**"

~SG, Gr. 4 Co-teacher~



RESULTS & DISCUSSION



Co-teaching models, when accompanied by **focused PD** and **co-planning** opportunities, have the potential to increase **student-teacher interaction, instructional flexibility, and attention to student needs** – and, thus, may promote more meaningful mathematical discourse and, in turn, **positive student learning outcomes**.

This work is significant because it has the potential to identify best practices, strategies, and tools to support teacher education and PD with specific emphasis on the intersection of co-teaching and math discourse to support linguistically diverse classrooms

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