

PATHWAY FOR PARAEDUCATORS

BOSTON PROJECT FOSTERS GROWTH OF PARAEDUCATORS IN MATH CLASSROOMS

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*“Before, I couldn’t stand math. But I like this program.
Last year, I taught the whole unit of math because that’s how empowered I was.
[I am] confident and ready to do it. Now I love it!”*

This statement of confidence by a paraeducator came after her participation in Doing the Math With Paraeducators: A Research and Development Project. Funded by the National Science Foundation (NSF DRL-1621151), the project was designed to provide experiences to support professional growth by building paraeducator mathematical knowledge for teaching and leadership in Boston Public Schools.

Paraeducators can play an important role in schools by supporting, complementing, and extending the work of classroom teachers. They have

unique assets to share and are more likely to reflect student demographics than teachers. For example, in Boston, 86% of students are nonwhite; 71% of paraeducators are also nonwhite, compared with only 38% of teachers.

Furthermore, paraeducators often live in and establish close ties with the communities where they teach, making them well-suited to make connections among staff, students, and families and include strategies and examples in their teaching that reflect their students’ lives and cultures (Rader & Pennell, 2019; Ernst-Slavit & Wenger, 2018).

Providing paraeducators with sustained professional learning and

opportunities to continue their education can open important pathways to full teaching positions, which has the potential to diversify the teaching pool and address the critical teacher shortage that disproportionately affects high-need urban schools (Walker, 2019).

However, paraeducators face barriers that can prevent them from developing as professionals. Many have multiple jobs because of their low salaries, family responsibilities, and limited professional learning or planning time with their teacher colleagues (Butt, 2018; Uitto et al., 2017; Sharma & Salend, 2016).

Another major obstacle is that



Ara Tejada, left, and Carmen Vidal, paraeducators at Sarah Greenwood School in Boston, engage in collaborative problem-solving during professional learning.

many paraeducators do not see themselves as teachers, as was evident at our first meeting of Doing the Math. One paraeducator said with resignation, “We are just the paras,” while another lamented, “I’ve been a paraprofessional for a long time, and sometimes people think you’re just in there to wipe tables or do behavioral stuff.”

By participating in the project, however, the paraeducators we

worked with made a profound shift in perspective. They began to see themselves as mathematics teachers and even as mentors to their colleagues. With growing confidence, some are now returning to college, others are enrolling in test preparation courses with a goal of taking the state certification exam, and all are assuming greater teaching responsibilities within their classrooms. In these formal

and informal ways, they are not only entering the teacher pipeline but strengthening it.

FOSTERING GROWTH

What led to this shift? Our data, gathered through surveys, observations of professional learning and classroom interactions, and interviews from two cohorts of paraeducators, point to a cycle of experiences that encouraged

GUIDE FOR TEACHER-PARAEDUCATOR MATH PLANNING		
FOR PARAEDUCATORS	FOR TEACHERS	FOR BOTH TOGETHER
Describe something your teacher did in math (e.g. a question she asked, an example she used, or a comment she made) that encouraged student understanding.	Describe something your paraeducator did in math (e.g. a question she asked, an example she used, or a comment she made) that encouraged student understanding.	<ul style="list-style-type: none"> • What is a goal you can both set for the paraeducator to accomplish over the next few weeks? (Examples: Lead a small group, whole group, work on a particular concept with a small group over time.) • What are action steps you can both take to facilitate achieving that goal? • Describe the progress toward the goal. • What is something that happened in math class that you can celebrate together?

paraeducator growth, as described here. For each element, we offer evidence of the ways in which it contributed to paraeducator learning and teaching.

Professional learning must be tailored to the needs of paraeducators.

We offered 30 hours of professional learning, over the summer and the following school year. It emphasized the following:

Focus on mathematics for teaching. Most paraeducators began with little confidence in their own mathematical knowledge, and limited experience with math professional learning. As such, our initial sessions were intentionally structured to create a safe atmosphere so that they could express confusion and let go of their anxiety.

During these sessions, paraeducators engaged in mathematics for themselves. The discussions focused on mathematical understanding and problem-solving strategies as opposed to executing procedures. Sharing strategies with their colleagues proved to be a powerful experience. Many had only learned traditional algorithms and were not prepared to teach children who learned in a variety of ways.

For instance, one paraeducator said, “Listening to the different paras’ strategies ... I’m [now] more open to saying, ‘Oh, why don’t you use this manipulative?’ or ‘Is there another way you can do it?’ or ‘How did you get that answer?’ ”

Widen exposure to the district mathematics curriculum and available resources. Because our paraeducators’ roles had been confined to monitoring students to ensure they were on task, they had little familiarity with the district curriculum. Limited access to computers and printed copies of the curriculum materials, along with infrequent planning time with their teachers, further limited their exposure.

As a result, they were not aware of the mathematical goals for the students or the sequence of lessons in each mathematics unit. Once they explored the curriculum and understood the purpose of the professional learning activities, they were able to engage with the students in new ways.

As one paraeducator said, “Oh, I love the math games because you learn how to play the games properly. And so, when I go back after a session, I have that confidence to have a conversation and use the right language.”

During the sessions, we also shared resources and tools, such as the One Hundred Chart, the number line, and various manipulatives (e.g. counting cubes and bears). Some had never engaged with these resources before, and, by using them, they recognized the importance of these tools and representations, thus increasing their sense of competence.

Analyze student work. Once paraeducators increased their comfort with and ability to solve problems and share multiple strategies with

their colleagues, they were ready to analyze students’ work. As they investigated samples in which students solved a problem in a variety of ways, paraeducators identified and described, in detail, how each child approached the problem.

They compared the solutions across the student samples and discussed what each student knew and the type of practice required for students to be successful. We supported paraeducators to understand the importance of *listening* to students as opposed to *telling* students what to do, and we reviewed questions that would elicit student thinking.

Paraeducators found the process of looking at student work very meaningful. Via interviews and surveys, they described the importance of working to understand a problem before teaching their students and being prepared to prompt student thinking with questions such as: Can you explain what you’ve done? Can you tell me more? Is there another way? Knowing these strategies helped them develop their facilitation skills to support their small-group work with students.

Encourage partnerships between teachers and paraeducators.

To encourage partnerships between teachers and paraeducators, we included teachers in one session at the beginning of the project, and we asked them to complete planning protocols (see example above) that they

submitted to us at regular intervals. The protocols required teachers to list specific strategies they observed when paraeducators were teaching math and discuss them in relation to the goals of the lesson.

As the partnership grew, we noted that teachers became more intentional about including paraeducators in their planning. In the past, teachers had rarely provided paraeducators with advance notice or information about mathematics lesson activities or goals. Moreover, as a result of the partnership, we saw that paraeducators became more aware and often better prepared for what would happen each day. Here are observations from two paraeducators:

- “Before, I didn’t have a clue of what we would do. When she did the lesson, I would see it. After the professional development meeting with the teachers, we started to sit together and do planning together.”
- “Now ... she tells me in advance what she will be doing next and adds, ‘What do you think we can do to help that child?’ She even gave me books that I read at home.”

Validate paraeducators’ growth through transformed roles and responsibilities.

In addition to facilitating the group sessions, project staff visited paraeducators in their math classrooms and debriefed with them afterwards. For most, this was the first time anyone had observed their math teaching or given them feedback.

Paraeducators appreciated the observations as a validation of their practice. One said, “Something good that she [the observer] noticed was that we asked the children more ‘how’ questions, e.g. ‘How do you know?’ ‘Can you explain to me what you learned?’ That way, a person realizes that they are doing the job the way they should do it.”

Validation also came from

teachers in the form of increased math responsibilities and professional conversations. Based on survey and interview data, we found that teachers noticed changes in the way paraeducators interacted with the students during math class, particularly their ability to listen to student thinking, ask good questions, and identify appropriate resources to differentiate instruction. As a result, they gave paraeducators more responsibility and allowed them to take initiative.

One teacher described the change she saw in her paraeducator this way: “Last year, she was comfortable photocopying but either didn’t feel comfortable teaching or didn’t see it as part of her role. This year, she’s very involved. She talks to every student about what they’re doing, what they’re thinking. For example, someone had built a tower of $10+9$. She said, ‘How did you know it was $10+9$?’ She could have just moved on, but she stopped to ask.”

As responsibilities increased, many paraeducators noticed that both their teacher and their students were seeing them as another professional in the classroom. This further enhanced their feelings of self-worth. As one paraeducator said, “Sometimes [the teacher] even tells me to do the lesson [myself]. And it’s giving me that confidence, [her] saying, ‘I know you can do this.’ Those encouraging words are so helpful to me.” By the end of the project, almost all of the paraeducators facilitated small-group math learning, and some began leading whole-group math lessons.

Throughout this transformative time, we identified ways in which paraeducator-teacher math conversations deepened. Teachers asked for the paraeducators’ opinions, and the paraeducators reported their observations about how students were progressing and what tools and resources were helpful for their students.

As one teacher explained, “The

more confident she became with the curriculum, the more she was able to make recommendations and had wonderings about what or why [something] was happening with a kid and suggest questions or alternative things to do with them.”

Build a math community.

Paraeducators valued having time and space during professional learning to meet as a cohort and share ideas, mathematical strategies, and challenges. Rarely had this opportunity occurred during the school day.

Paraeducators continued to confer with one another at their schools, especially when trying to support struggling students or figure out confusing mathematics concepts. Their conversations and relationships grew as they shared new knowledge and instructional approaches.

Paraeducators told us of their increased connections and sense of pride in their colleagues. One said, “I’m proud of my colleague because at our first [professional learning] meeting, she was just really unsure. Seeing her confidence getting better and going up to the board to show us what she was doing was a great thing.”

In one school, including paraeducators on the math leadership team strengthened the community. Teachers on the team noticed that paraeducators asked good questions and made suggestions about how to extend mathematics teaching during after-school time.

Develop paraeducator mentors.

Our first paraeducator cohort was eager to continue, so we engaged in a second year of professional learning. Paraeducators cultivated their leadership abilities by facilitating sessions about analyzing student work for a new cohort of paraeducator colleagues.

This paraeducator-mentor program model went beyond the typical one-and-done format by supporting the new paraeducators’ teaching and learning

throughout the year. It also deepened mathematics knowledge of mentor paraeducators while helping them plan sessions and discuss potential challenges.

Paraeducator mentors expressed pride at their accomplishment in facilitating the sessions. As one said, “At first, I didn’t know if I was doing a good job, but when I saw a reflection that somebody wrote in their journal about me and the lesson that we did, I [thought], ‘Wow ... I made an impact on somebody!’”

Other participating paraeducators said they felt comfortable with the mentors, with whom they identified, and felt motivated by the authority and responsibility given to these peer leaders. One said, “I loved it because they were my peers, and it was just wonderful to see them running the show. You know? So that gave me confidence that I can do it, too.”

The only complaint registered was that the one-hour meetings were too short, requiring conversations and problem-solving to continue beyond the meeting. One paraeducator said, “We didn’t want to stop, and then we were talking about it at lunch with the other paras. So the conversation kept going, and we kept talking about it until we came up with a solution.”

The teachers also noted that paraeducators who mentored others seemed more comfortable and enthusiastic about teaching math. They showed a willingness to take on even more responsibility in the classroom. “Having [her in the project for] two years was very beneficial to our students. She was able to go deeper — do a minilesson on her own. Last year, it would have been trickier to do that.”

CONFIDENCE MATTERS

While paraeducators face many barriers to professional growth, our data suggest that it is especially important to address their lack of confidence. Helping paraeducators feel more comfortable with mathematical problem-solving increases their enjoyment of math and translates into greater confidence, both in teaching students and collaborating with their classroom teachers. This in turn leads to increased responsibility and a larger role in the classroom.

Our project findings suggest that this process doesn’t happen quickly, but rather develops over multiple years. By embedding sustained, effective paraeducator development models in school systems, we can recognize paraeducators as capable educators. Increasing professional opportunities and responsibilities can unlock their untapped potential and create career pathways.

The cycle of professional learning, project staff support, and teacher partnerships in which we engaged during this project developed paraeducators’ identities as teachers and learners of mathematics. Through this work, they came to see themselves as professionals, capable of furthering their education and their careers.

As one paraeducator said, “I just know seeing the youth [growing and learning] ... is something that I want to do. I’m going to continue my education, and one day be a math teacher.”

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