BOSTON TEACHER RESIDENCY

Michael & Susan Dell
FOUNDATION

"When I graduated college, my understanding of how to use data effectively on behalf of my students was limited. As a student teacher in a third-grade classroom in undergrad, I understood that I was getting important information about my students through my classroom observations and meeting with them in small groups. I could see that one student was struggling with math or another was struggling with reading. But I didn't have the skills to change my instruction based on that information. That changed at Boston Teacher Residency. Through their focused instruction on data, I developed the tools and strategies to understand what my students need and how to go about helping them."

— Lindsay Eldredge, Boston Teacher Residency 2014 graduate, currently teaching at Dudley Neighborhood Charter School in Boston, MA

PROGRAM HIGHLIGHTS

- **Strong leadership and vision**
- **Clearly defined data literacy practices**
- **Highly skilled faculty**
- Operational supports for a strong data-use culture
- **Defined outcomes for candidate success**

BACKGROUND INFO

YEAR FOUNDED: 2003

LOCATION: Boston, MA

TYPE OF PROGRAM:
Full-time teacher-preparation program that combines a year-long classroom apprenticeship, or residency, with master's-level coursework.

DEGREE EARNED:
Master's degree in Education from University of Massachusetts Boston

The Boston Teacher Residency (BTR) is a full-time teacher-preparation program combining a year-long classroom apprenticeship, or residency, in the Boston Public Schools with master's-level coursework. Run by the 31-year-old education organization BPE[1], which works to ensure all Boston students are taught by exceptional teachers working in high-performing schools, the residency places candidates with experienced teacher mentors in designated BPE teaching academies (similar to the teaching hospital concept). Residents work in teacher teams in both small-group and whole-class settings and assume increasing classroom responsibility over the school year.

BTR focuses on developing highly capable "ambitious" teachers who reflect their students' diverse racial and ethnic backgrounds and come armed with key subject-area skills the district especially needs (math, science, English as a second language and special education). BTR serves as a pipeline for homegrown teaching talent designed to keep Boston's once-high teacher turnover at bay; residents are expected to teach in Boston Public Schools for at least three years after graduation. "I want to train teachers who are obsessed with kids' learning," says Jesse Solomon, BTR founder and executive director of BPE. Solomon expresses that obsession through a data literacy lens: BTR expects teachers to use data habitually, systematically and sensitively.

The program's data literacy approach has shifted significantly in recent years, triggered by a BTR-commissioned 2011 Harvard study that found recent BTR grads teaching grades 4-8 were less effective at boosting math scores than other Boston Public Schools teachers with similar experience levels. In contrast, BTR grads with four or five years' teaching under their belts tended to show *greater* student learning gains than their similarly experienced BPS peers. The findings served as a wake-up call. BTR graduates early in their careers seemed to be less effective on the one measure the program prioritized above all else: student learning.

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1   formerly, the Boston Plan for Excellence

To ensure BTR graduates are effective from day one, leaders redoubled efforts to equip teachers with the full complement of data skills they need to help students achieve significant, measurable academic growth throughout the year. They refined their vision of what data are most relevant to student growth. Where once the program focused solely on formative, day-to-day data collection and analysis, it now trains teachers how to connect these important formative data elements with summative state assessments. Each type of student data has a clear role in helping BTR graduates focus on student learning outcomes. A new course, "Using Data," gives teachers more concrete tools and techniques and data skills are starting to be more thoroughly integrated across the curriculum. Although the transition is ongoing, visits to the program in fall 2014 surfaced many emerging best practices around data literacy.

STRONG LEADERSHIP AND VISION

Strong leadership has helped accelerate and smooth the program's transition in the wake of the 2011 study—a watershed moment for BTR leaders that influenced both their definition of what data are relevant and what data literacy skills residents must master before graduating.

In its early years, BTR emphasized a relatively traditional approach to K-12 instruction, says director of clinical teacher education Marcie Osinsky, who has overseen BTR's teacher-prep curriculum since 2003. BTR residents were taught to "plan lessons, teach lessons, collect evidence of student learning, analyze the evidence of student learning and then use that evidence to inform their instruction for the next day," Osinsky says. But BTR's dominant philosophy at the time meant standardized tests weren't part of the picture.

After seeing the 2011 Harvard study results—and recognizing the political reality that summative tests are part and parcel of today's teachers' work—leaders realized teacher graduates needed skills to work with both the summative standardized test data and the formative measures BTR had always valued. Solomon pushed staff to help teaching candidates drive student growth against a broader range of indicators, including the results of such

standardized tests as MCAS and PARCC.[2] This cultural and pragmatic shift hasn't always been easy, staff say, but a coherent and effective approach to data literacy training has started to emerge. And clinical teaching staff have begun to embrace this vision of how teachers can use both formative and summative data to help their students achieve greater academic growth.

Jennifer Amigone, BPE director of strategic data services, credits Solomon's direct communication and decisive action as significantly accelerating faculty-wide acceptance of this new mode of data-centric teacher preparation. "With Jesse saying, 'This is what we're doing across the board,' there's been an organizational expectation and accountability in place to make sure that happens. But there's still work to be done."

Solomon agrees. "Getting content faculty on board is a process," he says. "Everyone will agree that student learning is most important, but there are significant differences in the way people think student learning should be measured."

Osinsky, for her part, stresses that inclusion of standardized tests doesn't signal a move toward "teaching to the test," but rather is a refinement of the approach BTR has always espoused. "Yes, we collect test scores now," she says, "but we are clear with residents that it's not just the score that matters. What matters is, 'How do you use this score to inform what you already know about your students?'"

HIGHLY SKILLED FACULTY

Nationally, most teacher-preparation faculty are experts in traditional teaching methodology and pedagogy, not data skills. BTR has creatively filled the void, recruiting in-house data experts (who were originally hired in non-teaching operational roles) to teach candidates to use data to fuel student learning.

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2   MCAS and PARCC are both standardized tests. The Massachusetts Comprehensive Assessment System (MCAS) is a set of exams used to assess student performance on Massachusetts' statewide education standards. All students in grades 3-8 and 10 at schools that receive state funding must take the exam each year. The Partnership for Assessment of Readiness for College and Careers (PARCC) is a new computer-based test that will measure students' abilities according to the Common Core standards in math and English.

"We have a very expert veteran staff of teacher educators. They are extremely strong on the nuances of teaching, such as understanding how students reason," says Ed Liu, BPE chief improvement officer. "But the majority of them were teachers in a pre-high-stakes accountability environment. They know a lot about instruction and collecting data through exit tickets, quizzes and teacher-created assessments—and then using it—but they don't necessarily know a lot about how to incorporate standardized assessment data."

Solomon didn't have to look far before finding an expedient and innovative solution to bridge the gap: He tasked Amigone and Liu with designing and teaching a stand-alone data literacy course. Both Amigone and Liu have K-12 teaching experience but neither had previously taught in the BTR teacher-prep program. Originally hired from Rutgers University, Liu started as BPE's director of organizational learning, overseeing BPE's research into why certain teachers produce exceptional student learning gains and working with faculty to share his findings so they could tweak how or what they taught would-be teachers. At Rutgers he had been an assistant professor of educational administration, so tapping him to lead a data course wasn't a quantum leap. Solomon's decision to pull Amigone into the faculty mix, however, was more daring. Though she had years of experience working with teachers and school leaders to build data-use capacity, she had no experience teaching graduate students. "I never would have anticipated I would be teaching," says Amigone, who came to BPE with a policy and research analyst background from Standard & Poor's school evaluation services.

Nevertheless, Solomon was confident in his decision. "The hard part of hiring someone to teach a data literacy course is finding people who marry the two worlds, who can think about instruction and about how to teach residents to prioritize the data to see if and how students are learning. Together, Jennifer and Ed cleared the bar." Liu and Amigone quickly designed a course, first offered in fall 2012, to help BTR residents refine their data literacy skills.

Osinsky says the solution has been effective. "What Jennifer and Ed have been really great at doing is naming the habits of mind around data and the specific technical skills residents need. They had the technical skill set to

design the course, and the knowledge about what kind of data exists out in the world. They were able to really present a lot of different ways of looking at data and a lot of different ways to represent data."

CLEARLY DEFINED DATA LITERACY PRACTICES

While BTR's mandatory, stand-alone data course addresses a curricular gap, today leaders are working on the more complex challenge of infusing data literacy across the curriculum to make it more robust.

When BTR initially took on data literacy in earnest, Amigone saw first-hand the need to help residents gain some technical and quantitative skills. "My first interface with teachers as they tried to engage in data was eye-opening," she says. "I had created this beautiful Excel spreadsheet, and we were sitting down to look it. Then I saw a teacher writing on the side, doing the math on a piece of paper, not in Excel, and I thought, 'Oh my, we have a lot of work to do. Teachers are being asked to do so much with no support.'"

Amigone and Liu say their year-long class "Teacher Research: Using Data" was initially an outlier in the broader BTR curriculum. In the course's inaugural year, they focused on quantitative data and standardized assessments "in reaction to this big gap," Liu says. "We kind of assumed that a framework for what we taught lay elsewhere in the program. But we learned that it didn't. And so we've taken it upon ourselves to be very explicit about framing quantitative data skills as a fundamental part of good teaching."

Their course teaches BTR residents how to "assess students' understanding every day to inform instruction." By the end of the year, each candidate should be able to:
- Distinguish between formative and summative data.
- Establish a reliable data analysis calendar.
- Articulate principles of responsible data use.
- Ask thoughtful and appropriate questions about classroom–, grade– or school-level data.
- Use quantitative data to reveal group or temporal trends.
- Use multiple data sources, from the classroom and assessments, over time to plan and adapt instruction.
- Share data and progress effectively and compellingly with colleagues, students and families.

- Understand key research on early-warning indicators and college readiness and know what to keep an eye on with K-12 students around these areas.
- Use spreadsheets to electronically track and analyze student-level data.

Candidates are taught to use a tracker to collect and prioritize relevant data so they can see learning patterns emerge and tailor their instruction appropriately. For example, they are asked to design weekly assessments, then analyze and reflect on the results.

To better tie the data course to the subject matter and pedagogical skills residents learn in BTR's broader curriculum, Amigone and Liu continually survey residents, review exit tickets and seek input from colleagues about what works. "It's easy to create a stand-alone data course," says Liu. "It's an add-on; it doesn't disrupt the rest of the program. It's been a challenge to push beyond that."

But faculty's efforts to forge those program-wide connections have started to pay off. "The course was just data topics at first," Osinsky says. "Now it's more connected to what the residents are doing in other courses and out in the field." Sarah Little, who coaches residents in their classroom work as director of elementary literacy, says the stronger bridge between the data course and the rest of the curriculum is critical to helping residents actually apply the data skills they learn.

For example, in a resident-created, eight-week informational writing unit on the rainforest, Little and others worked with Amigone and Liu to help the residents understand how to define the unit's main goals, pace out the measurable steps, and decide what kind of data to collect along the way. (Such as: 'How well are your students using conventions like capital letters and periods?'). Amigone and Liu helped residents develop a tracker to monitor individual skills as well as a long-term tracker.

"The point is to ensure residents understand that you can't just write out eight weeks of plans and then never adjust them," Little says. "You have to shift, based on how kids are doing."

Working with early-stage teaching candidates can complicate the integration challenge. When students are just starting to grasp the fundamental skills required to teach, they don't have a lot of classroom context in which to place data literacy.

"They can help residents with broad concepts and definitions, and how the data is laid out," Osinsky says. "But when it comes to, 'What do you do with the fact that 20 percent of your class didn't get this question on fractions?'—they may or may not be helpful, because the resident may or may not [yet] know how to teach fractions."

Adds Liu: "We're continually asking, 'How do we line up certain concepts so that the timing of when we do something is powerful and has the promise of leading residents to deep understanding? Some of the practices we want to develop require prerequisite knowledge about kids, about content and about pedagogy in order to be a maximally powerful learning experience."

While the stand-alone data course fills a clear need and increasingly meshes with the rest of what happens at BTR, as of fall 2014, Solomon still sees the institution's approach to data literacy training as a work in progress.

"We are pushing for full integration—I mean, I don't have a separate data strand in my work; using data is part of what I do every day, period," Solomon says. "We want to get to that point as a program."

DEFINED OUTCOMES FOR CANDIDATE SUCCESS

BTR has long espoused a philosophy of developing teachers who treat all their K-12 students as "sense makers" who can demonstrate their learning in many ways. The 2011 Harvard study prompted BTR to strengthen its emphasis on the need for teachers to use a broad range of data to evaluate—and respond to—just what, as Liu says, "students are making sense of."

BTR is pragmatic about the fact that a single year (versus other institutions' multi-year programs) is a tight timeline for producing fully data-literate teachers. But BTR doesn't expect its graduates to simply fend for themselves once they start running their own classrooms: Induction support around data literacy and other teaching skills are part and parcel of BTR's teacher training. Though the institution's

OUTCOMES: MAY 2015

100% of residents understand the different purposes of formative and summative assessment.

97% of residents develop and/or use daily assessments to track student progress.

97% of residents develop a summative assessment for the end of a unit.

97% of residents use data to identify specific groups of students to whom you might target extra help or small group instruction.

93% of residents understand various types of data and how they can inform your work as a teacher.

93% of residents analyze patterns in student responses to a specific assessment (or item) to gain insight into what they understand or don't understand.

86% of residents use a data tracker (e.g., Excel spreadsheet) to systematically collect student data over time.

86% of residents use data to determine when to move ahead to the next topic/skill in the unit, and when to slow down or reteach.

80% of residents manipulate or analyze data to identify patterns or trends.

75% of residents utilize student data to communicate student progress with students, parents, or the larger school community.

Source: Boston Teacher Residency resident survey

explicit data literacy outcomes for graduates are a work in progress, graduates are expected to have a:
- Baseline set of quantitative and qualitative data literacy skills.
- Sensitivity to the range of information that education data comprises.
- Belief in the power and relevance of data-driven instruction.
- Habit of data use to inform their approach to individual children in their classrooms and ongoing lesson planning.

"Too often, data is an event," Liu says. "We do this assessment every six weeks; we sit down; we look at it. But that's not frequent enough. It's often not driving daily practice. Teachers don't necessarily know how that should affect their practice. 'What's the next step?' 'What's the next implication?' 'What's the specific set of next moves you can do in order to change that data picture?' Those are the questions BTR graduates should always be asking."

Little adds: Graduates should "be able to triangulate multiple sources of data to help inform their instruction. Teachers have to know who their kids are as people, and that's data. But there's also another kind of data that's a little more objective, that you can actually see: what percentage of words a kid got right and which words they missed, for example. You have to put those things together to ensure kids learn."

Solomon has set the tone for BTR's brand of data literacy. He emphasizes the need for a range of measures of student academic growth—including standardized test scores—to serve as a proxy for measuring BTR residents' effectiveness as teachers. In a recent survey, 93 percent of principals in schools with BTR-trained teachers rated BTR graduates similarly or more effective than their teaching peers with the same years of experience; 97 percent of principals would recommend hiring a BTR graduate. But Soloman also emphasizes teaching and true data literacy as a never-ending process of gathering information, assessing academic needs, and improving outcomes against very clear goals.

"We put a tremendous focus on raising student achievement as our end goal," Solomon says. "It's really difficult for a first-year teacher, though, to balance and use well all the various forms of data she has for students over the course of a school year. Too often, the emphasis is just on an end-of-the-year assessment which, while useful in assessing progress and overall performance, is not used to improve instruction; it has a finality to it. I don't like the term summative. Data are always formative. Summative means that it's done," Solomon says. "[But] it's never done."