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Sustaining a Continuous Improvement Culture in Educator Preparation: A Higher Education Network Based on Data Wise

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Cover Page Footnote

The authors would like to acknowledge their colleagues who participated in the Data Wise pilot from University of Massachusetts, Boston, University of Massachusetts, Dartmouth, and Gordon College. Special thanks to Gordon College for continuing our Data Wise Network over the past several years. We are also grateful for the support of Ben Klompus, the Data Wise coach who supported Endicott College and University of Massachusetts, Boston through our initial training and first year of work.

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Abstract

Educator preparation programs across the U.S. are grappling with the best way to respond to new state policies requiring they use data to demonstrate and accelerate improvement in program outcomes. Supported by a grant from the Massachusetts Department of Elementary and Secondary Education, the educator preparation program at Endicott College integrated the Data Wise Improvement Process into its practice. Not only did the Data Wise work help improve student outcomes by engaging the Endicott team in a form of practitioner research, but it also led to the creation of a network of educator preparation programs that, since 2015, has used Data Wise in an annual cycle of continuous improvement. This article includes recommendations for other educator preparation programs looking to integrate a sustainable improvement process based on the tenets of practitioner research, as well as suggestions for forming networks of continuous improvement across preparation programs in a state or region. The article concludes with a discussion of implications for research and policy.

Overview: Changing Policy in Educator Preparation

The 21st century has seen significant changes in the research and practice of educator preparation in the U.S. Since the early 2000s, policy-makers at the federal, state, and organizational levels have called for new ways to prepare our nation's teachers. In 2010, for example, the National Council for Accreditation of Teacher Education Blue Ribbon Panel proposed that educator preparation programs (EPPs) focus their work on field-based clinical practices rooted in deep partnerships between EPPs and local schools and districts (National Council for Accreditation of Teacher Education, 2010). In 2014, the United States Department of Education proposed regulations that would require EPPs to document that their graduates were positively impacting PK-12 student learning (U.S. Department of Education, 2014). The organization Deans for Impact (2017) has provided a platform for education deans to lead change in their programs and states, while publishing research aimed at improving how EPPs understand candidate's preparation needs. In 2018, the American Association of Colleges for Teacher Education, recognizing the strides made in clinical partnerships and practice, yet identifying the wide range of ways in which such work is defined and carried out, called for a "pivot" in the field toward "a common lexicon and a shared understanding of evidence-based practices for embedding teacher preparation in the PK-12 environment" (p. 2). As these calls to action suggest, the landscape of educator preparation is transforming, and those working at the

state and EPP levels are tasked with moving the work forward in the coming years.

State Level Change: The Massachusetts Context

While national organizations have set a stake in the new territory of educator preparation, the work of training the nation's teachers typically remains in the hands of the states. In 2012, the Council of Chief State School Officers issued a report, "Our Responsibility, Our Promise," which asked states to place educator preparation at the center of their education agendas. With the ability to approve or shut down educator preparation programs, issue teacher licenses, and collect and disseminate data, state departments of education, CCSSO argued, held an authority over EPPs that could make a measurable difference. This call to action resulted in the Network for Transforming Educator Preparation (NTEP), launched in 2013, which supported participating states' creation of policies explicitly aimed at improving the preparation programs under their purview. In 2017, CCSSO released "Transforming educator preparation: Lessons learned from leading states," a report claiming that all states had begun to take steps to improve educator preparation and that the 14 states who were members of NTEP had started to "move the needle," share strategies, and document successes (p.4).

The Massachusetts Department of Elementary and Secondary Education (DESE) was an early participant in the NTEP initiative, and teacher preparation programs in the state have seen significant policy changes as a result. The state went about this process through several strategic initiatives. First, DESE focused on "[r]aising the bar for teachers" by increasing required hours in the practicum and developing a teacher candidate assessment protocol that mirrors the evaluation process for in-service teachers (CCSSO, 2017a, p. 2). Next, they turned to "[s]etting rigorous standards for preparation programs" (CCSSO, 2017a, p. 3) through a new program approval and rating process (DESE, 2016). Finally, DESE decided to use "data to measure success" by sharing state-collected data with preparation programs, along with a new expectation that each program create a data-driven plan to ensure continuous improvement (CCSSO, 2017a, p. 3).

During the years that these policies were announced and rolled out (2009-2015), the Massachusetts DESE intentionally and collaboratively increased EPPs' access to meaningful data. DESE was already collecting a wide range of data on PK-12 and higher education, which DESE staff began to share with EPPs across the state. Now, for the first time, EPPs had access to data about how their program graduates fared after they left their programs. For instance, EPPs were able to see which districts hired the majority of their graduates, as well as the

aggregate ratings program completers received on the state educator evaluation (CCSSO, 2017b; Data Quality Campaign, 2016, 2017). In turn, Massachusetts's EPPs were asked to use that data to understand the effectiveness of their programs and, as needed, make intentional, measurable changes. In Massachusetts, the shift from DESE collecting and sharing data purely for accountability, to sharing data for the purpose of continuous improvement, was fully underway.

Policy Impact on Educator Preparation

Research on creating a culture of evidence in EPPs across the country has revealed that “even when relevant and useful data are available, they are often not used for decision making” (Peck & McDonald, 2013). In the face of rapid and substantial policy changes, educator preparation programs in the state were expected to learn to manage, interpret, and act on data while simultaneously meeting new program approval guidelines, incorporating new professional standards, and training practicum supervisors and teacher candidates in a new Candidate Assessment of Performance. For the majority of EPPs in the state, these changes were significant, and, while programs were accustomed to adapting to new policies, the new access to data posed an interesting challenge. With data about their program graduates, EPPs were being asked to look deeply at their own work as educators and be accountable for the training they provided to teacher candidates. This “intentional study of one’s own professional practice” was, in effect, a form of practitioner research, an established and growing field that aims to create opportunities for educators “to better understand the complexity of teaching and learning” (Dana, 2016, p. 1) by engaging in cycles of research led by practitioners themselves. As EPPs began to engage in practitioner research, faculty members and administrators wondered: How could a culture of inquiry and data-based action be created and sustained within EPPs? How could such action draw on the strengths of the practitioner research tradition? How would the higher education context, which lagged far behind the PK-12 world of data-driven decision making, influence the way EPPs analyzed and used the new data being presented to them?

Data Wise: A High Leverage Practice in Educator Preparation

In order to accelerate and refine Massachusetts' EPPs' use of the data now available to them, DESE devised and offered professional development opportunities to train and support education preparation faculty and staff as they shifted their culture to focus on data-driven decision making and continuous improvement. One of the earliest opportunities DESE offered was to fund two EPPs to attend the Harvard Graduate School of Education's Data Wise

Leadership Institute. The “Data Wise Pilot,” as it was called, invited the two selected participating EPPs to explore whether the Data Wise cycle of continuous improvement, designed for PK-12 districts, could be successfully adapted for educator preparation. Data Wise, an eight-step process described below, aligns with the pragmatic strand of practitioner inquiry in which “the individual or group identifies a problem and acts on the problem by gathering data, reflecting on that data, hypothesizing a solution, testing the solution, gathering data on the effects of the improvement effort, and making necessary adjustments” (Gordon, 2016, p. 1).

The purpose of this initial collaboration between Data Wise, DESE, and the Massachusetts EPPs was to determine if Data Wise was a meaningful tool for continuous improvement in higher education. During the summer of 2013, Endicott College was one of two EPPs in Massachusetts selected to participate in the Data Wise Pilot. Endicott’s educator preparation programs graduate between 150 and 200 teacher candidates annually, at both the baccalaureate and post-baccalaureate levels, in a variety of licensure fields. DESE fully funded the Endicott team’s participation, with the expectation that the group would evaluate Data Wise’s applicability to the field of educator preparation. The team attended the five-day Data Wise Leadership Institute in the summer of 2013 and worked with a Data Wise coach throughout the 2013-2014 academic year to complete a full cycle of inquiry based on the Data Wise Improvement Process. While the Year 1 cycle was exploratory, all stakeholders (DESE, the EPP and the Data Wise leaders) agreed that Data Wise could be an effective tool for continuous improvement in the broader Massachusetts educator preparation context. Not only did the Data Wise model offer a clear approach to data-driven continuous improvement, but its approach was also driven by practitioner research, which resonated with the team and the state and national trends in educator preparation.

The Data Wise Improvement Process

The Data Wise Improvement Process was born out of a collaboration between the Boston Public Schools (BPS), Harvard Graduate School of Education, and the Boston Plan for Excellence. In the early 2000s, BPS system leaders realized that while teachers and principals had access to more student performance data than ever before, they needed guidance about how they could use their data to make meaningful improvements in teaching and learning (Boudett, City, & Murnane, 2013). The group worked together to research and share effective data use practices and to codify the best practices in an improvement cycle, now called the Data Wise Improvement Process.

The Data Wise Improvement Process is an eight-step process divided into three phases: Prepare, Inquire, and Act (see Table 1). In the Prepare phase, which reflects one of the “[c]ommon features” of practitioner research, namely “community and collaboration” (Dana, 2016, p.1), schools organize for collaborative work. They ensure that teacher teams have adequate time to meet, set norms for working collaboratively, and establish effective meeting structures. Administrators also create an inventory of available data sources, as well as an inventory of instructional initiatives ongoing in the school. Schools complete the Prepare phase by building assessment literacy, which entails learning principles of responsible data use and understanding the skills tested in the key assessments their students take.

As with other forms of practitioner research, the Inquire phase begins with identifying a question. The school leadership team creates an overview of summative data related to the school’s current focus area. Teachers work together to make meaning out of the data and find a story in it, which leads them to generate a priority question that will guide further inquiry. Unique to the Data Wise process are two additional data-driven steps aimed at narrowing the priority question by developing a deeper understanding of students and instruction. In Step 4, teachers typically begin working in grade-level or department teams to dig into the data of the students that they teach. Step 4 concludes with each teacher team identifying a *learner-centered problem*, something that students are struggling with related to the priority question they generated in Step 3. In Step 5, teachers examine their own instruction to understand how they are contributing to the learner-centered problem.

In the Act phase, teacher teams research instructional strategies that may help them address their problems of practice. They consult with experts in teaching their area, from instructional coaches at their school to district curriculum specialists. They work together to design lesson plans and practice teaching them to one another. They write an action plan for how they will implement their new instructional approach, and a plan for how they will assess their progress. Finally, they implement the new approach, monitoring their action plan and assessing it on their plan to assess progress as they proceed. At the end of the cycle, they review student outcomes, celebrate any successes they have achieved, and plan next steps for continuing to improve teaching and learning in that area.

Table 1
The Data Wise Improvement Process

Prepare phase	Step 1: Organize for Collaborative Work
	Step 2: Build Assessment Literacy
Inquire phase	Step 3: Create Data Overview
	Step 4: Dig into Student Data
	Step 5: Examine Instruction
Act phase	Step 6: Develop Action Plan
	Step 7: Plan to Assess Progress
	Step 8: Act and Assess

Source: Boudett, City, & Murnane, 2013.

The Universal Data Wise Improvement Process

While the original Data Wise Improvement Process (Boudett, City & Murane, 2013) was designed for and by teacher teams within schools, in 2015, district leaders in Prince George’s County Maryland decided to see whether they could adjust the process to make it applicable to central office teams as well. Prince George’s County Public Schools had already adopted Data Wise as its improvement process for all of its schools (Yurkofsky & Higgins, 2017), and system leaders hoped that if system-level teams, from the instructional supervisors to the transportation department, engaged in Data Wise as well, it would build coherence and spur improvement throughout the system (D. Rease and M. Davis, personal communication, January 23, 2015). With a few changes in the wording of the steps, the district found that the translation worked well, the

Universal Data Wise Improvement Process (as the Data Wise Project now refers to it) was born (Lockwood, Dillman, & Boudett, 2017).

The Universal Data Wise Process is very similar to the original process, but while the original process is aimed at teams of teachers working to improve student achievement in their classrooms, the universal process uses broader language so that it can be used by any team of professionals hoping to improve outcomes for the people they directly support. Three of the steps have slight changes in wording to reflect that broader focus (See Table 2). Step 2 is *build data literacy* instead of *build assessment literacy* (since a team of food service workers, for example, may not find reading scores applicable to their role, but team members do need to be literate about the data sources that help them assess their work). Step 4 is *dig into data* rather than *dig into student data*, since not every team will be directly serving students. Along the same lines, Step 5 is *examine own practice* rather than *examine instruction*, since teams using the Universal Data Wise Improvement Process are not generally teachers.

Table 2
Data Wise Improvement Process: Original vs. Universal Version

Step	Original Data Wise Improvement Process	Universal Data Wise Improvement Process
2	Build assessment literacy	Build data literacy
4	Dig into student data	Dig into data
5	Examine instruction	Examine own practice

Source: Lockwood, Boudett, & Dillman, 2017

Case Study: A Data-Driven Continuous Improvement Cycle at Endicott College

Since 2014, Endicott College’s School of Education, led by Dean Sara Quay, has been using the Data Wise Improvement Process to structure its continuous improvement cycle. The School of Education has undertaken a variety of continuous improvement projects using the Data Wise cycle as a practitioner research process, including: identifying a list of early indicators for

program success; strengthening preparation to teach special education; culling common professional practice goals in need of development during student teaching; and analyzing trends in graduates' educator evaluations on the professional standards for teachers. An example of the impact that the Data Wise Improvement Process has had on one element of the Endicott teacher preparation program has to do with the required state teacher tests, the Massachusetts Tests for Educator Licensure (MTEL). These are high stakes tests; in order to become a licensed teacher in Massachusetts, teacher candidates must pass the MTEL required for their specific license. The tests cost on average \$100, and candidates must pass two to three tests to be licensed. Earning a passing score on required MTEL tests the first time a candidate sits for the exam saves time and money, and until candidates pass all of the required MTEL tests for their fields, they are ineligible for teaching positions. By following through with the Data Wise cycle of improvement, Endicott's undergraduate elementary licensure program was able to increase teacher candidates' pass rates for first time test takers on the General Curriculum/Math MTEL by 28 percent in a single year.

The Data Wise cycle focused on the General Curriculum/Math MTEL pass rates among Endicott elementary teacher candidates took place between September 2015 and June 2016 (for more detail, see Table 3). While Endicott has required students to take workshops to prepare them for all MTEL, including Math, the program had never done a deep dive into the student data around pass-rates. More specifically, we had never followed an established cycle of continuous improvement, like Data Wise, that guided us through the steps of identifying a learner-centered problem and problem of practice. In following these steps, we were forced to look more closely at exactly *where* our teacher candidates were struggling on the Math MTEL (what specific test objectives they were not meeting) as well as *why* that section of the test was so problematic (what exactly did they not understand). In looking at the data, we were able to develop an instructional practice targeted at the specific area with which candidates were struggling that changed the way Endicott math is taught to elementary teacher candidates. In doing so, we were able to increase candidates' success on that element of the Math MTEL, improve the pass rate of first time test-takes, and enhance the program's math curriculum at the same time (See Figure 1). In addition, the engagement in Data Wise increased the data literacy of all of the EPP team members, acting as critical professional development in an era of increased expectation that teacher candidates, and therefore teacher educators, use data wisely (Bocala & Boudett, 2015).

Table 3

A Step-by-Step Application of Data Wise to Educator Preparation

Data Wise Step	What the Endicott Team Did (fall 2015-spring 2016)
Step 1: Organize for Collaborative Work	The project team met in mid-August to review the Meeting Wise (Boudett & City, 2014) ¹ protocols, the Data Wise norms, and the steps of the Data Wise Improvement Process
Step 2: Build Data Literacy	We charted the first time pass rates of teacher candidates on all MTEL, examined course and test-prep syllabi, and looked at teacher candidates' SAT scores.
Step 3: Create Data Overview	In this step, the program dean identified a <i>focus area</i> for this cycle: elementary math. We noticed in our exploration of data related to math that despite three required and targeted math-for -educators courses, the pass rate on the test aimed at assessing candidate's knowledge, the General Curriculum/Math MTEL ² , tended to remain at 70% or lower. Scores had also declined in recent years. From this observation, we developed a <i>priority question</i> to guide further inquiry: "What General Curriculum/Math MTEL content do our teacher candidates struggle the most with?"
Step 4: Dig into Data	By examining the individual score reports of teacher candidates who had taken the test, and compiling the results on each of the four sections of the General Curriculum/Math MTEL, we noticed that Endicott's teacher candidates performed least well on the open-response questions. This part of the test asks candidates to review a math problem and an elementary student's answer to it. Candidates must be able identify and correct any errors in the student's work, explain what aspect of the work was not mathematically sound, and then provide an alternative way to solve the problem. We agreed upon the following <i>learner-centered problem</i> : "On the General Curriculum/Math MTEL, our

¹ *Meeting Wise: Making the Most of Collaborative Time for Educators* (Boudett & City, 2014), written by two of the Data Wise co-authors, describes the type of effective meeting practices that support teams in using an improvement process such as Data Wise.

² Candidates for the elementary license in Massachusetts must pass the General Curriculum test which includes a math subtest. This is the test we focused on and is referred to here as General Curriculum/Math MTEL.

elementary teacher candidates perform most poorly on open-response questions.”

To determine whether one of these tasks was more difficult than the others, we administered an open response practice question to the candidates and assessed each of the areas. We also surveyed them about which task was most challenging to them. The data aligned: the teacher candidates struggled with knowing how to instruct students on alternative methods to solve a math problem.

Step 5: Examine Instruction

We next looked at instructional data such as course syllabi, lesson plans, and faculty interviews in order to develop our *problem of practice*: “As faculty members, we are not teaching our candidates about how to instruct students in alternative methods of solving a math problem.” This was not happening in coursework or the MTEL preparation workshop for this particular test. Without such instruction, our candidates were not able to successfully answer that part of the open-response question.

Step 6: Develop Action Plan

The *instructional strategy* that was implemented in the General Curriculum/Math MTEL lab was to have students work through the part of the open response questions they were weakest in: alternative methods for solving a math problem. Our action plan included six steps:

- 1) Give teacher candidates a pre-test in the General Curriculum/Math MTEL workshop on open-responses
- 2) Instruct candidates in what it means to provide alternative methods for solving a math problem. We did this in a scheduled workshop and also added two workshops on the topic.
- 3) Give candidates time to practice providing alternative methods.
- 4) Give candidates a practice open-response question and have them solve it using their new knowledge.
- 5) Have candidates take the General Curriculum/Math MTEL.

Step 7: Plan to Assess Progress

Short-term: We planned to assess progress by analyzing students’ practice answers to open-response questions to determine if our instructional strategy resulted in better scores on a practice test.
 Medium-term: We gave a post-test in the General Curriculum/Math MTEL workshop on open-response questions to evaluate impact.
 Long-term: We assessed what percent of these students passed the General Curriculum/Math MTEL on the first try.

Step 8: Act and Assess

The adjustment to instruction about how to answer the open-response question resulted in a **28% increase** in the number of first time test takers' passing the test (See Figure 1).

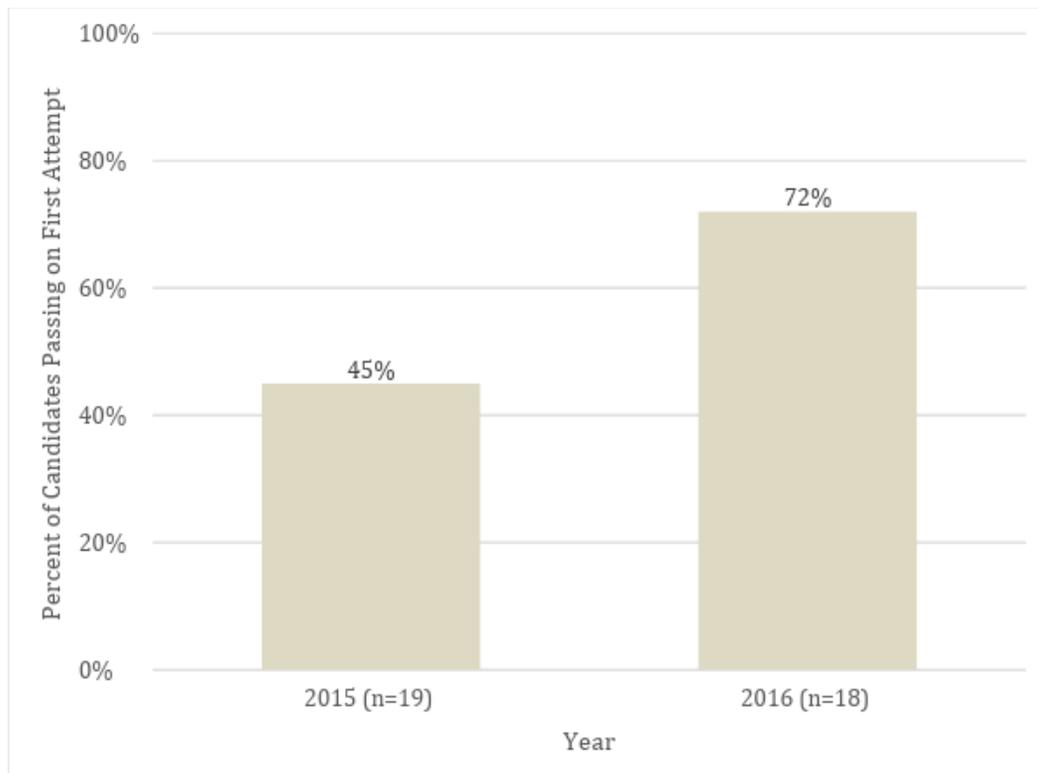


Figure 1. Percent of Endicott Teacher Licensure Candidates who Passed the General Curriculum - Math MTEL on the First Attempt, Before and After Data Wise Cycle

Adapting Data Wise for Educator Preparation

The Endicott team members were pleased to discover that the Universal Data Wise Improvement Process translated well to its work in educator preparation programs. As is the case for any team who is not directly teaching K-12 students, the Endicott team needed to tailor the process for the EPP context.

First, the team realized our “learners,” the focus of our cycle, would be our teacher candidates, rather than the K-12 students that they taught. Therefore, K-12 students’ standardized test scores were not relevant to our process, but the teacher candidates’ MTEL scores were. In Step 4, Dig into Data, we wanted to use multiple sources of data about how our candidates were doing, rather than solely focusing on the MTEL, so we realized that we needed to collect our own data to analyze. We created surveys and conducted interviews and focus groups to gather additional data to help us come to a shared understanding of a learner-centered problem.

In Step 5, Examine Own Practice, we realized that, in our context, a problem of practice would sometimes be located in the classroom, but oftentimes it was based in policy, administrative practice, or assessment practice. We learned to define our “own practice” broadly and look in all of those places to understand what we were doing as a program that contributed to our learner-centered problem.

Sustaining the Work: Data Wise Higher Education Network

In Year 2 of the Data Wise Pilot (2015-16), participating EPPs took several steps to further develop a culture of continuous improvement in our institutions. First, the two programs that had completed the first Data Wise Leadership Institute continued to work with a coach to complete the cycle of data analysis and change. The following summer, the dean of Endicott’s School of Education, Sara Quay, served as a teaching fellow at the Data Wise Summer Institute, coaching two new Massachusetts EPPs in learning the Data Wise approach to continuous improvement and doubling the number of EPPs using Data Wise. Quay also received additional training to become a certified Data Wise coach. Also during Year 2, the four EPPs met on four days, two each semester, to work on their projects. Starting in Year 3 (2016-17), the four institutions split into two regional groups. Now in Year 4 (2017-18), Endicott and its neighbor Gordon College continue to meet four times a year.

Lessons Learned

Members of the Endicott team quickly learned that in order for this type of improvement to succeed, they had to be willing to dive into the work, knowing that what we tried might not succeed immediately. As with all practitioner research, we had to be open to charting an unknown course. We took the risk of trying out our action plans prepared to persist and adjust course until we solved

our problems of practice and saw the improvement in student outcomes we were hoping to see.

We found it very helpful to work with a Data Wise coach as we got started, someone who knew the model well and could help guide us through the most challenging parts of the process while being open to our adaptations for the higher education context. Though each of our teams had a designated leader, someone whose role it was to keep the work moving, each team leader was learning the process while doing the process. It would have been difficult, therefore, to make it through our first cycles without the support of someone who had seen the cycle through many times. Also, since Ben Klompus, the coach who supported our first cycle in 2014-15, and Meghan Lockwood, who supported our network in its first year, 2015-16, were doctoral students at Harvard Graduate School of Education and not members of any of our institutions, they were able to provide objective outside perspectives on our work, which we found helpful.

Below, we summarize recommendations for creating a culture of continuous improvement in an education preparation program and for creating a network to sustain continuous improvement.

Recommendations for Creating an EPP Culture of Continuous Improvement: Year 1

Changing a culture is never easy, and doing so when the impetus for change comes from an external source like a state department of education can add a layer of resistance or misunderstanding to an already complex process. Below are some highlights of what worked for us in our first year of Data Wise as we negotiated the cultural shift at Endicott College:

1. **Select a continuous improvement process that is appropriate for the institution's context.** Having a designated continuous improvement process facilitates improvement work and helps maintain the team's focus and accountability. Data Wise has worked well for a variety of EPPs in Massachusetts due to the clear structure, processes, and adaptations that have been made. Other processes may be more effective for other contexts.
2. **Create a small, pro-active continuous improvement team that will be trained and lead one manageable project in Year 1.** A project narrow in scope assures the team can experience some success with the entire continuous improvement cycle the first year. A team that is open to

reflection and adjustment, while being willing to persevere through the learning curve, will help ensure this outcome. Consider attending training together and working with a coach for your first year.

3. **Embrace the tenets of practitioner-research.** Be open to reflection and curious about *your own practice*. Practitioner research is different from the more traditional assessments of your work, such as course evaluations and annual reviews. As Dana (2016) writes, “[i]n contrast to evidence-base practice, practice-based evidence can be defined as the many forms of data that are naturally generated from the everyday teaching and learning acts that take place in classrooms and schools” (p. 2). Being an inquisitive explorer of the practices that are happening in your own educator preparation program is key to success and change.
4. **Establish four meeting days during Year 1 between September and May.** Two meetings per semester allow the team to go through the continuous improvement process following the steps in an efficient way. Our team organized each meeting to focus on different Data Wise steps: Meeting 1/Steps 1-2; Meeting 2/Steps 3-4; Meeting 3/Steps 5-6; Meeting 4/Steps 7-8. While we were flexible in this plan, having the steps guide each meeting also kept us on task.
5. **Try to meet off campus or in a location outside of the familiar department space.** Meeting off campus or in a different space limits distractions and sets the stage for thinking about the work in new ways. It can add to team cohesiveness and can support the norms the team sets.
6. **Design meeting days with a clear agenda so that time is structured and work moves forward.** A lot of work needs to be accomplished on each meeting day. We used *Meeting Wise* (Boudett & City, 2014) to organize and design our meetings, which was very effective.
7. **Share the work of the continuous improvement team with other stakeholders at your EPP throughout Year 1.** This helps build understanding and curiosity about the work. It will also help to identify additional team members to invite to participate in Year 2.
8. **Identify faculty and staff who show interest in continuous improvement work to become part of a larger continuous improvement team in Year 2.** Through sharing of the work (see #7) faculty and staff who express interest should be next in line to build the

team. Look for those who are excited about participating so that Year 2 can also be a success.

9. **Consider working in two smaller teams in Year 2.** Train the new members in the continuous improvement process and build capacity for managing multiple projects. This expands the work and also sustains it, further creating a culture of inquiry and improvement.

Recommendations for Creating a Network to Sustain Continuous Improvement: Year 2 and Beyond

Unlike one-off professional development workshops, which we know from research do not lead to sustained and meaningful improvements in practice (e.g., Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009), a network facilitates collaboration over time that is focused on each institution's core work. A network is a low-cost way to maintain momentum and catalyze improvement because the network provides not only accountability, but also opportunities for capacity-building. Being able to share the process, and projects, across institutions develops deeper understanding and often inspires new ideas around continuous improvement.

In terms of accountability, we have joked that having a network is like having a running partner: just as it is much easier to head out for a run on a cold winter's morning if you know your running partner is waiting for you on the corner, it is much easier to sustain your team's commitment to improvement work if you know another team will be waiting for you at your network day, expecting to hear you present about your progress. A network can also create an affordable opportunity to infuse outside expertise into improvement work, since members can share the cost of bringing in outside experts as occasional or ongoing advisors. Some recommendations for forming and maintaining a continuous improvement network are:

1. **Select and commit to the four annual meeting days, taking turns at each institution.** As described above, the four days aligns well with continuous improvement cycles like Data Wise. Meeting at both institutions is a simple way to meet in a different space, at least half of the time.
2. **Organize each of the four days so that time is structured.** Just as in the four meetings days described above, the network meeting days should be

organized to move the work forward. The *Meeting Wise* (2014) format has been effective for the four teams in the network.

3. **Build in time to share continuous improvement projects across institutions.** EPPs are engaged in similar work, using a similar method, toward common goals, despite their varying contexts. Sharing work and process is both encouraging and informative.

Implications for Research and Policy

In addition to the other federal and state mandates to which EPPs are held accountable, data-driven continuous improvement is a relatively new addition to the work of our nation's EPPs. Developing a sustainable culture of data-based decision making can be informative, inspiring, challenging, and costly. Further understanding of how data can be used effectively is critical to ongoing success in this area, and practitioners are eager for more research into how EPPs can best use data for continuous improvement. Practitioner-based research, such as the Data Wise process described here, is one such model. Just as EPPs must document their graduates' readiness for the classroom, so must governing bodies ensure that policies lead to meaningful outcomes. Future questions researchers and policymakers may address include: What data do state departments of education need to provide EPPs? What data is most valuable? What systems are most effective for EPPs to use in their continuous improvement efforts? What data is actionable? What examples of measurable program improvements are available from the field? Are these successes useful across different EPP contexts? These and related questions must guide work at both the policy level and in the field as all stakeholders continue to strengthen the preparation of today's teachers and, ultimately, the students they serve.

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