



The Science of Improvement in Teacher Preparation

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Abstract

Due to new United States Federal Regulations and the Council for the Accreditation of Educator Preparation standards focusing on kindergarten through 12th grade (K-12) student outcomes, teacher education providers are facing the challenge of gaining access to their graduates' teacher effectiveness and K-12 student learning data. The College of Education (COE) at the University of Hawai'i at Mānoa, a large, public research university, has taken strategic steps to secure post-graduation data access for program completers with the primary purpose of using it for program improvement. To do this, we needed a disciplined process for employing data as the driver for improvement.

Improvement science provides a methodology for accelerating the process of learning to improve through disciplined inquiry. The field of education has seen numerous rapidly deployed reform initiatives that have failed to deliver their desired outcomes. Bryk, Gomez, Grunow, and LeMahieu [2] propose that the common thread in such failed change initiatives is the act of "going fast and learning slow." In order to counter this common occurrence, there must be a shift in thinking and practice to "learning fast to implement well" [p. 6-7]. Central to this approach are gradual, iterative cycles that focus on evidence related to specific problems of practice and the influence of system factors on the implementation of change [1; 6]. Working within networked communities, practitioners engage in rapid cycles of learning through a plan-do-study-act process that seeks to build shared knowledge and ownership within the improvement process [3; 4; 5].

Using the improvement science model as our guide, we started by focusing our work to be problem specific and user-centered. Specifically, we needed to better align our candidate intake, assessment, and graduation processes across five teacher education programs. We also sought to learn more about variations between program processes. We used our exploration to align around clear action steps serving an overall COE goal. Through this process, we have learned that the tools and processes of improvement science offer a way for teacher education providers to build capacity and drive innovative improvement initiatives.

1. Introduction

Due to new United States Federal Regulations and the Council for the Accreditation of Educator Preparation (CAEP) accreditation standards focusing on kindergarten through 12th grade (K-12) student outcomes, many teacher preparation providers feel that they are now facing a daunting task of gaining access to their graduates' teacher effectiveness and K-12 student learning data. Teacher preparation programs are severely challenged to access data on their program completers beyond graduation, and those that are able to access data have very few (if any) practical exemplars that guide their improvement work. The University of Hawai'i at Mānoa's College of Education (COE) has taken strategic steps to secure post-graduation data access for program completers with the primary purpose of using it for program improvement. To do this, the COE has engaged key partners to access and link critical post-graduation in-service teacher performance data back to individual COE programs to evaluate how preparation methods affect in-service performance. These data linkages catalyze the most critical part of the equation - effective data use. As new data systems are put in place, processes must also be developed for meaningful use of such data for continuous improvement. Using the research of improvement science, the COE has organized a structure and routine to engage faculty in a process through which both internal pre-service teacher candidate data and external post-graduation teacher effectiveness data are used as a guide for measuring and managing their work. The tools and processes

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of improvement science offer a way for education programs to build capacity and drive innovative improvement initiatives.

2. Foundational Literature

The field of education has seen numerous rapidly deployed reform initiatives that have failed to deliver their desired outcomes. Bryk, Gomez, Grunow, and LeMahieu [2] propose that the common thread in such failed change initiatives is the act of “*going fast and learning slow,*” and in order to counter this common occurrence, there must be a shift in thinking and practice to “*learning fast to implement well*” [p. 6-7]. “Experiences across many different fields now caution humility about how much must be learned in order to transform successfully a change idea into new human capabilities, into day-to-day practices that work reliably, and into the redesign of organizational arrangements necessary to support all of this” [2, p. 6-7]. Improvement science provides a methodology for accelerating the process of learning to improve through disciplined inquiry. Originally utilized in industrial fields, improvement science then expanded to successful use in other fields, including health care, and is now gaining ground as a potentially powerful tool for improvement within the field of education [2; 5]. Central to this approach are gradual, iterative cycles that focus on evidence related to specific problems of practice and the influence of system factors on the implementation of change [1; 6]. Working within networked communities, practitioners engage in rapid cycles of learning through a plan-do-study-act process that seeks to build shared knowledge and ownership within the improvement process [3; 4; 5]. In contrast to experimental science which focuses on the minimization of variation in implementation in order to draw causal conclusions, improvement science allows for and promotes learning from variation in practice and contexts within improvement initiatives [2; 5]. There are six foundational principles of improvement science that can serve as a guide for implementing improvement initiatives within the field of education:

1. Make the work problem-specific and user-centered,
2. Focus on variation in performance,
3. See the system that produces the current outcomes,
4. We cannot improve at scale what we cannot measure,
5. Use disciplined inquiry to drive improvement, and
6. Accelerate learning through networked communities [2].

Improvement science provides a process for the meaningful use of data in addressing the growing concern in the field of education related to linking teacher preparation programs to their graduates’ impact on K-12 student learning. (For a comprehensive guide to the application of the improvement science principles within the field of education, see Bryk, Gomez, Grunow, and LeMahieu [2]).

3. The Improvement Process

This project draws on the innovative use of data to lay the foundation for the successful preparation of quality teachers. The utilization of the tools and processes of improvement science is an exemplary practice with a long history in other sectors, albeit new to higher education and teacher preparation programs. We are engaged in a collaborative problem-solving and accountability process, designed to accelerate learning and the adoption of improvement initiatives, ensure fidelity of implementation, and manage the change process among the individuals who are necessary for its success. Our improvement routine makes use of both qualitative and quantitative data to inform actions and decision making. Examples of quantitative data we are utilizing include in-service teacher performance evaluation ratings (i.e. K-12 student growth percentiles, classroom observations, tripod student survey data, student learning objectives, and core professionalism), pre-service program assessments, student teacher observation scores, grade point averages, and other admissions data points for entering teacher candidates. Examples of qualitative data include survey results from student teachers, program completers, mentor teachers, and principals, and program inputs such as comparative admissions processes. Our work promotes the use of both qualitative and quantitative data as foundational to improvement science.

Our core objective is to do the work of improvement to meet our own internal advancement goals - not to simply comply with external requirements and check boxes on our accreditation reports. At the COE, we strive to prepare knowledgeable, effective, and caring educators. For this reason, our improvement project is aimed at determining how the COE can best prepare our graduates to be effective teachers who



are capable of increasing K-12 student learning. Our project work began with identifying the improvement science model for using data to drive continuous improvement. The COE engaged key partners, including the Hawaii Department of Education, the Hawaii Data Exchange Partnership, and UPD Consulting, in order to (a) access and link our graduates' in-service teacher performance data back to COE teacher preparation programs and (b) to develop and apply an improvement routine based on improvement science research. Within the COE, we established a core improvement team comprised of multiple (two to four) faculty representatives from each of our five teacher preparation programs, the department chairs for each program, and college-level leadership, who meet regularly to collaboratively establish and work towards our improvement goals; this collaborative process is aimed at ensuring that we maintain a user-centered focus (Improvement science principle 1).

The improvement process began by getting problem-specific and identifying a unifying improvement goal that stretched across the multiple COE teacher preparation programs (Principle 1). This entailed establishing clarity around our goals and theories of action (i.e. hypotheses about what actions will leverage the greatest progress toward a goal). The first hurdle we encountered when applying this process was in setting a college-wide goal for improvement. We learned very quickly that within the COE there were diverse ideas about the work of improvement. Despite some initial disagreements, we collaboratively coalesced around one improvement goal. However, simply having a goal statement did not mean that we all agreed on how to measure it or that we had an aligned vision for the essential knowledge and skills effective first-year teachers should have upon graduation. Therefore, as our next step, we had to structure our conversations around establishing which actions we believed would help us to reach our goal and the associated measurements for indicating short- and long-term progress (Principle 4).

Our work moving forward now centers on continuously testing the theory of action we have as a college for progressing towards our improvement goal. Our theory of action focuses on specific actions to be taken by each program and the college together, in support of CAEP standards 1 (Content and Pedagogical Knowledge) and 3 (Candidate Quality, Recruitment, and Selectivity). We have four identified critical action areas:

1. Develop shared assessments across programs for measuring teacher candidate performance,
2. Implement a shared rubric for observations in student teaching and field experience,
3. Develop revised admission processes aligned across programs and linked to our effective teacher framework, and
4. Revise recruitment practices and align by program to meet supply/demand challenges in articulation with Hawaii K-12 schools.

The process of defining these critical action areas included identifying key questions, identifying the data needed to answer the research questions underlying each action area (some data already existed and some were aspirational), and then linking questions, data/answers, and action steps. We are applying this improvement process as the disciplined structure by which we cyclically measure, plan, act, and remeasure within our improvement community (Principle 5).

Using data from existing COE systems (assessments, surveys, admissions, and other metrics), as well as the data obtained on program completers' in-service performance, we develop visualizations (graphs and tables) that distill progress or performance of the issue or project at hand and share these in group sessions with our improvement community team. These sessions shine a bright light on progress and performance and create a shared message of accountability for results. We carefully analyze variances between our programs to identify differences in practice and theorize how these differences contribute to differences in outcomes (Principles 2 & 3). The sessions also offer an opportunity for collaboration among participants on tactics to improve performance, as well as for discussion of prioritization of efforts where resources are constrained. Faculty and leadership engage in joint problem solving and mid-course corrections to improve performance and better measure progress. In this current project, faculty and leadership will continue to assess progress, make changes, and measure inputs and outcomes as part of our improvement routine. The COE is committed to continuously improving our programs and the preparation of future teachers, and the improvement science model is helping to increase our capacity to do so.



4. Implication for Action

Based upon our results thus far, examples of expected actions include revised admissions policy and processes for the various COE programs, the development of collective cross-program candidate assessments, new non-traditional recruitment efforts for the COE, revised student teacher feedback cycles/processes (including training for mentor teachers and university administrators), and an agreement about appropriate student supports for candidates and accompanying “gateposts” for student success throughout the individual programs. Without action, our improvement routine would be simply a data meeting. Action that is measurable, accountable, linked to outputs and outcomes, and driven by a collective goal and theory of action is key to the improvement science process. We hope to help others in their improvement work by sharing four main realizations: (1) a process is required to measure and manage the work of improvement; (2) change is difficult, and, without clear goals and work-specific levers for change, programs stay stuck in their current position; (3) stakeholder input is critical, but it requires strategic facilitation so that input leads to action; and (4) providing data is not enough - understanding what it means and how it drives future action is a skill that is built over time and best done when driven by practitioners.

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