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Innovation and Induction Clusters

A Proposal for Integrating Research, Development, and Teacher
Professional Preparation

This paper makes the case for a shift in the policy strategy to improve K-12 education. It argues for investment in an infrastructure to develop the knowledge base on effective teaching and learning, and to prepare new teachers according to that knowledge base. As in medicine, the infrastructure would be located within practice settings, and consist of a set of schools within school districts that serve as the sites for research and development focused on practice, and for the induction of new teachers. The Cluster of schools stretching from the earliest grade through graduation would be a critical point of intersection for faculty from research and teacher preparation institutions, and K-12 teachers and administrators.

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Education Policy: The Failure of Good Ideas

In a remarkable acknowledgement of the short-sighted approach of education policy makers, the National Conference of State Legislatures (NCSL) concluded that “most state education systems are falling dangerously behind the world, leaving the United States overwhelmingly underprepared to succeed in the 21st century economy” (NCSL, 2016, p. 4). They warn against “silver bullet” policies that have been commonplace in the U.S., noting that “after all of the national, state and district reform efforts during the decade following No Child Left Behind, the U.S. was outperformed not only by a majority of the advanced industrial nations, but by a growing number of less-developed nations as well” (NCSL, 2016, p. 6). Balancing urgency and constraint, they recommend that action be taken immediately, but that the goal be the long-term development of a coherent and systemic approach to building a high-performing system.

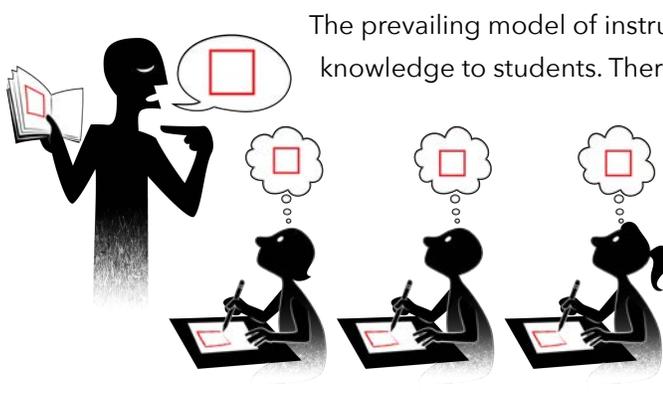
Policy makers have a relatively small set of policy levers for influencing the production of goods and services—whether it is private sector production or the production of public services such as schooling. They can use incentives and accountability measures, provide or improve the flow of information, or make new investments in capacity. In education, federal and state policy makers have relied primarily on incentives and accountability standards as the levers for improvement (Hannaway & Woodroffe, 2003). The appeal of these two policy levers is that they promise a quick, easily understood response at a relatively low cost. Incentives have been used at various levels: the individual teacher, the school, the district, and the state. At the individual level, performance pay is intended to attract good teachers, provide an incentive for them to stay, and discourage ineffective teachers (Murnane & Cohen, 1986). Policies supporting charter schools or school vouchers are intended to use competition as an incentive. The assumption is that families will ‘vote with their feet,’ and demand will allow good schools to thrive and expand while poor schools will either improve or be abandoned (Chubb & Moe, 1988; Hoxby, 2003; Gill, 2007). Incentives have been used at the state and district level to reward policy changes with additional resources (ARRA, 2009).

The second lever, accountability, operates through higher standards and high stakes testing. Teachers, schools, and districts are held accountable for improving student outcomes, and exposed when students' performance falls short of the standard (Ladd, 1996; Hannaway & Woodroffe, 2003). Schools can be closed and reopened with new leadership and new staff. In the most extreme cases, districts can be put in receivership (see, for example, New York State's policy at p12.nysed.gov/oisr/Receivership).

While the logic of these policies is straightforward, they have produced disappointing results time and again. For incentives and accountability to effectively produce sizable improvement, the capacity for improvement must exist, even if it is dormant. In the absence of that capacity, we should expect those policies to produce the weak results we routinely observe, and the relative decline of the U.S. education system that the National Conference of State Legislatures considers in need of an urgent response (Hannaway & Woodroffe, 2003; NCSL, 2016).

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The Common Core State Standards (CCSS) and the Next Generation Science Standards (NGSS), the most recent efforts to use the accountability instrument to change classroom instruction, raise the bar on what is expected of teachers and students. Students must be able to explain their thinking, make and defend arguments, model relationships, and critique the reasoning of others—practices that require teachers to manage very complex and unpredictable interactions (Cohen & Spillane, 1992), perhaps explaining why such activities are largely absent in today's classrooms (Osborne, 2010; Cazden & Beck, 2008). But the effort to create a common standard falls short of a systemic response; there was no major investment in capacity, even though few believe the capacity to make the shift currently exists (Ball & Forzani, 2011; Loveless, 2014; Mongeau, 2014; Achieve, 2013). Investing in capacity must be central to the systemic approach NCSL endorses.



The prevailing model of instruction remains one in which the teacher “delivers” knowledge to students. There are times when knowledge delivery is what is

required. However, in many classrooms, even teachers who intend to engage students in discussion can nonetheless be observed leading students to fill-in-the-blank answers or responding to a student's comment by confirming or denying its accuracy rather than asking for an explanation (Reznitskaya, Wilkinson, Oylar, & Reninger, 2016).

Teachers can hardly be faulted for these practices; they are consistent with the model of teaching most have experienced themselves. In fact, for many of our daily purposes, it is the preferred model. If the goal is to explain how to get to a destination, or provide information on what ingredients go into a stew, telling is undoubtedly the most efficient approach—as it is for conveying the number and names of

planets, oceans, and continents. A central, uncontroversial finding in the research literature on human learning is that it is difficult to upend an idea that everyday experience reinforces (Donovan, Bransford, & Pellegrino, 1999). Thus, if we are to have students engaged in academically productive talk in order to meet the new 21st century standards, we will need professional preparation that is powerful enough to change the very conception of good teaching. In the absence of substantial investments in capacity building, we should once again expect widespread failure to meet the standards, and resistance from parents, teachers, and administrators whose students and schools will be deemed inadequate.

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Building capacity for education improvement is not just a matter of better preparing teachers and administrators; it also requires building the knowledge base on how to better prepare education professionals. Education, as Harvard professor Richard Elmore has argued, is a profession without a practice (Elmore, 2006). A first-year student in medical school anywhere in the country takes a common set of courses, as does a first year law or engineering student. However there is no shared canon for preparing teachers (Shulman, 2005; Wilson, Floden, & Ferrini-Mundy, 2001; Ball, Hill, & Bass, 2005; Ball & Forzani, 2009). It is also not clear what should be prioritized in pre-service training versus what can only be done effectively during induction or after practice is solidified.

We know that teacher capacity matters a great deal (Hanushek, 2011; Chetty, Friedman & Rockoff, 2014), but we know less about what exactly high-quality teachers do to create better outcomes (Jacob & Lefgren, 2004; TNTP,

2015), or how best to prepare teaching professionals to engage in high-quality practice (Goe & Stickler, 2008; Gulamhussein, 2013). The problem is widely recognized, and there have been efforts by researchers to offer ideas regarding essential knowledge and skills. Darling-Hammond (2006) has identified individual teacher preparation programs that appear to produce higher quality teachers, and collaborating researchers from several universities are attempting to define individual practices that could be nominated as core to teacher preparation (Core Practice Consortium, 2016). But these laudable efforts are a far cry from a consensus on the core components of professional preparation.

There is no shared canon for preparing teachers.

The public investment required to organize and expand the knowledge base on effective teaching, and to prepare teachers in accordance with that knowledge base, has had limited political appeal. Not only would it require new investment, but the timeframe for results is not well aligned with the timeframe of political elections. Nonetheless, these investments will be required for genuine progress if the underlying problem in U.S. K-12 education is indeed inadequate capacity (Cohen & Spillane, 1992).

The Role of Research

Research universities can justifiably be criticized for contributing too little to the knowledge base regarding both the critical dimensions and the essential content for the professional preparation of teachers and administrators. Given the higher stature accorded in academia to those who make theoretical rather than applied contributions and incentives to publish or perish, most faculty in the nation's top research universities have understandably invested little in generating knowledge for practice. However, the efforts of the Strategic Education Research Partnership (SERP) to support practice-embedded research and development demonstrate that much progress can be made without changing the incentive structures in universities—provided that the organizational structures are in place to support highly productive programs of research on problems of education practice.

University researchers who have worked with SERP in middle school settings to improve students' comprehension of content-area texts provide one example. Word Generation, an academic vocabulary program co-designed by researchers and teachers, introduces texts on controversial topics and provides opportunities for students to discuss and debate the issues using targeted academic vocabulary. By observing the importance of discussion in motivating students' attention to text and the eagerness with which students engaged with multiple perspectives, researchers generated new theory on the role of discussion in catalyzing comprehension. The team subsequently initiated new research, developed new research instruments (Diazgranados, Selman, & Dionne, in press; Uccelli, Barr, Dobbs, Phillips Galloway, Meneses, & Sánchez, 2015), designed additional instructional materials in collaboration with practitioners, and evaluated their impact on their newly hypothesized contributors and on comprehension outcomes (LaRusso, Kim, J., Selman, Uccelli, Dawson, Jones, Donovan, & Snow, April, 2016; Jones, LaRusso, Kim, J., Kim, H.Y., Selman, Uccelli, Barnes, Donovan, & Snow, under review; Kim, J., Hemphill, Troyer, Thomson, Jones, LaRusso, & Donovan, under review). The sizable dataset amassed from the project is generating a substantial body of publishable research by faculty at various stages in their professional careers.

While this example suggests that the goals of researchers and practitioners need not be at odds, investments must be made in the organizational infrastructure required for productive collaboration in practice settings if such examples are to become more common. When researchers must navigate the challenges of access on their own, they risk major investments of time with no assurance that the work will, in the end, be permitted to move forward.

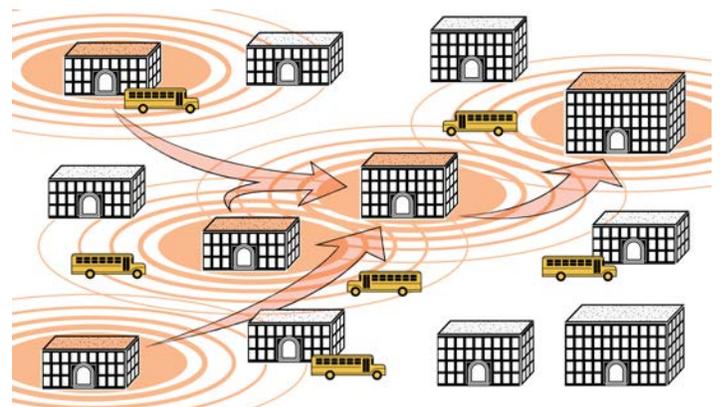
The absence of an organizational infrastructure is no less problematic for school districts. Currently, researchers who seek to work in school settings are a drain on the resources of district personnel who must vet and approve their requests. More importantly, district or school administrators must spend scarce political capital in order to persuade a set of schools or teachers to participate in a research study to which district leaders have committed. Many practitioners see the value of research and development, but even if only a few are resistant, they can impose a high cost on those attempting to facilitate a project (e.g., undermining the productivity of collaborative meetings and diminishing the motivation of colleagues, or expressing concerns to parents about their children being used as guinea pigs in experiments).

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Designated organizational structures are required in order to reduce the start-up costs for each new project and to minimize the inherent challenges and risks for both researchers and practitioners that accompany research and development in practice settings. And they are essential for building a coherent, ongoing, innovative research and development (R&D) program focused on understanding the teacher knowledge, skills, dispositions, and practices that are required to meet today's higher standards for student achievement.

The Proposal

The proposed organizational structures would be comprised of a cluster of elementary, middle, and high schools in each participating district. The clusters would be officially designated as research and development sites as well as induction sites. We refer to these schools as an Innovation and Induction (i2) Cluster with the intent that the schools form a feeder pattern so that students can be followed over time to create informative, longitudinal data sets.



Except for new teachers who are being inducted into the profession, any student, teacher, or administrator could choose not to be in these schools—as is the case with charter schools. Choice would remove from the mix those who have reservations about engaging in research and development. Moreover, the job descriptions of the teachers and administrators in these schools would include routine participation in education research and development for which they would be paid a premium. Classrooms would be open for observation at all times, and data collection, video recording, and shared work would be standard protocol. Political risks for district personnel would be reduced because the disgruntled would have the option of moving to any school outside the Cluster. Consent to use data for research purposes subject to standard confidentiality protections would be a condition for enrollment or employment in Cluster schools.

Locating formal induction programs for new teachers in this same Cluster of schools would have several benefits. Both induction and research can benefit from a concentration of master teachers in these schools. Their expertise in practice would allow them to contribute to its improvement in research collaborations, and to mentor new entrants into the profession effectively. Second, if the research program is intended in part to provide new knowledge on effective teacher preparation, then locating the work in schools where new teachers are concentrated is essential. Finally, if induction coincides with immersion in a culture of reflective practice, data analysis, and collaborative problem solving, a major cultural shift in the professional expectations would occur as teachers move from the i2 Cluster into other schools at the end of the induction period.

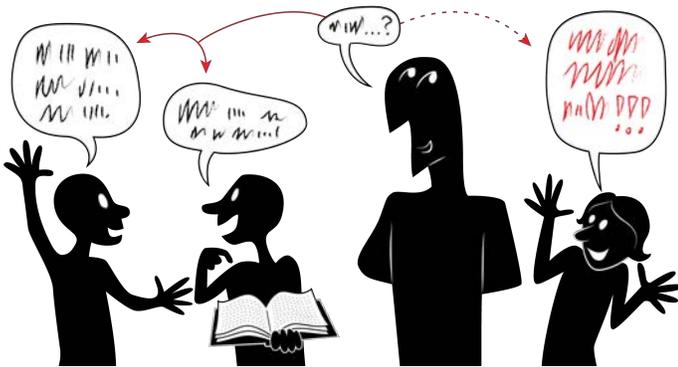
The i2 Clusters would serve as the point of intersection and mutual influence for faculty from research universities and faculty from colleges of education who train large numbers of teachers—two groups that currently intersect only rarely. They would provide fertile ground for informing more practice-focused pre-service education (Ball & Bass, 2003; Feiman-Nemser & Remillard, 1996; McDonald, Kazemi, & Kavanagh, 2013; McDonald, Kazemi, Kelley-Petersen, Mikolasy, Thompson, Valencia, & Windschitl, 2014). “Beginning with the work of teaching allows teacher educators to work analytically backward from what teachers have to do to what they have to know and believe” (Ball & Forzini, 2009, p. 503).

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For maximum impact, the i2 Clusters might be located in the most challenging geographic area of a school district. New teachers are already disproportionately concentrated in these schools, a corollary to the more experienced teachers moving out at first opportunity (Ingersoll & Strong, 2011; Ingersoll & Merrill, 2012). If expert teachers were recruited and paid a premium to serve as mentors and collaborators for R&D programs, the clustering of these talented teachers would provide an incentive for professionals to stay and for parents to send their children to these once undesirable schools.

Induction must elevate to a central role each teacher's curiosity about, and responsiveness to, the thinking of students. While the warrant for such a focus is the call for students to explain and justify their thinking in the CCSS, NGSS, and other standards for 21st Century learning, the research literature reinforces the importance of students' engagement in academic discussion (Applebee, Langer, Nystrand, & Gamoran, 2003; Murphy, Wilkinson, Soter, Hennessy, & Alexander, 2009). But a potent professional experience will be required to create such a shift in teachers' knowledge and beliefs regarding effective teaching.

Consider the experience that doctors go through as part of their induction into the medical profession. From the standpoint of knowledge and



skill development, the long shifts that residents are assigned—on call day and night—makes little sense. Sleep deprivation is hardly a prime condition for learning. But it is surely a formative experience in creating a professional disposition. It conveys that to be a doctor one must put one's practice before all else—a good night's sleep, a meal at home, time with family and friends. Friends and family are introduced to the *fait accompli*: inaccessibility comes with the territory.

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Teaching does not require middle-of-the-night calls to action; but the disposition required to be an excellent teacher is no more natural. It requires treating every day as a critically important opportunity to advance students' knowledge and capacity—though urgency is rarely signaled in the day to day of schooling. It means exploring students' ideas and prodding them to go further in their thinking—even though moments before these same students' behavior in the hallways may have raised doubts about whether they can think at all. It means recognizing signs of trauma and distinguishing them from simple uncooperative behavior.

Spending two years in a supportive environment in which the teaching load is reduced to allow for collaboration with colleagues and researchers, in which the challenges of teaching are the subject of shared curiosity, and in which investigations into instructional practice are routinely conducted, could provide the professional preparation that gives ordinary teachers the ability to engage in extraordinary professional practice. There is still much to learn about the content and duration of induction. But integrating induction with research and development will, over time, yield answers. And master teachers will be major contributors to generating those answers.

In some respects, the idea is not at all new. The autonomy to innovate within a school district is precisely what charter schools are granted. Linking preservice and induction in an intensive, supported program that helps to create a pipeline of teachers who are prepared for district needs and for today's standards is the goal of the urban teacher residency programs. And lab schools are designed precisely for the purpose of providing an accessible practice context in which research can be conducted. What is different is that the i2 Cluster would combine the three functions, creating a whole that is much more than the sum of the parts. Charters can innovate, but they do not expand the knowledge base or induct teachers to serve in schools throughout the district. Teacher residency programs address the induction element, but do not generate new knowledge for practice through research. Lab schools do expand the knowledge base, but they are not structured to serve as the engines of improvement for entire districts by feeding newly trained teachers to schools throughout the district. The structure and purpose of the i2 Clusters would be an invitation for those committed to any of these purposes to make common cause with others in order to have far greater transformative effect.

Integrating induction with research and development will, over time, yield answers.



Reality Check

Is the proposal realistic? The primary obstacle we foresee is funding—not the cost to society, but the policy decision to allocate, or reallocate, funds to make it happen. School districts and states already spend considerable amounts on teacher induction; in 2011, 85% of new teachers received some induction support; and a small percentage even received support over two years (Ingersoll & Merrill, 2012). Twenty-six states provide some support for new teachers, and sixteen of those states set aside funds for induction (Goldrick, 2016). Importantly, we know that in the absence of induction, 41% of new teachers leave the profession within a few years, and that minimalist approaches to induction have only a marginal impact on the attrition rate. However, a model of induction that extends over two years and includes mentoring, reduced teaching load, and collaboration with colleagues has been found in one study to cut attrition in half, and to have a positive impact on student achievement (Ingersoll, 2012). Research on the impact of student exposure to good teaching suggests that substantial investments in preparation and induction will yield high returns long into the future (Chetty, Friedman, & Rockoff, 2012).

The U.S. investment in education research and development is paltry; in 2019, the R&D budget for the U.S. Department of Education was less than 1% of the R&D budget for the National Institutes of Health (CRS, 2019; NCES, 2019). When NSF funding for education is added, the sum remains less than 3% of the NIH budget (NSF, 2019). While the investment level begs attention, existing research efforts can be made more efficient and productive. Researchers in every major city are already engaged in research initiatives that in many cases involve buying out teacher time to work with researchers. But their research is not organized to provide coherent answers to the pressing questions of professional preparation and effective professional practice. The i2 Clusters would provide organizational arrangements that will allow current investments to yield greater returns.

Policy decisions that represent a departure from the past are not easily made (Lindblom, 1959); models that demonstrate that an idea has been successful at another time or in another place can reduce uncertainty. Medicine provides such a model inasmuch as the challenges of providing strong professional preparation coupled with research and development are similar. The approximately 100 academic medical centers and their affiliated teaching hospitals provide evidence of the feasibility of creating dedicated practice settings in which research and professional training are concentrated (AAHC, 2014).

Nonetheless, new investments create political vulnerability because they require spending increases without promises of results quickly enough to be waved at constituents in the next election campaign. Yet the National Conference of State Legislatures has argued that state policy makers must accept responsibility for the long-term future of their populations and their economies, and address the systemic challenges of improving education outcomes. Creating an infrastructure for continuous improvement in education practice, and inducting new teachers into a culture of continuous improvement, would contribute to a system that can learn and change over time.

What is the alternative? The teacher capacity challenge must be addressed, and continuing to build teacher capacity by placing new teachers in the classrooms of more experienced teachers is simply not capable of delivering a major shift in practice. By design it delivers more of what already exists. Efforts to improve the content of professional preparation by convening panels of experts—a standard approach to charting a new policy course—is unlikely to be productive because the knowledge base on teacher preparation is insufficiently developed and differentiated to provide definitive answers that apply across contexts (Ball et al., 2005). It is for this very reason that a new structure is needed for an ongoing research and development program in experimental practice settings.

Creating an infrastructure for continuous improvement in education practice, and inducting new teachers into a culture of continuous improvement, would contribute to a system that can learn and change over time.

A Role for Philanthropy

As the National Conference of State Legislatures argues, the problem must be addressed by state policy makers who, in the U.S., have ultimate responsibility for public education. Private foundations and individual philanthropists may be helpful in clearing a path, and combatting the reluctance of policy makers. By investing in a small set of i2 Clusters and demonstrating concrete impacts, policy makers will be provided with evidence that can be used to accumulate political capital in advance of new investments. Once evidence of success lowers the risk, there will be incentives for policy makers at multiple levels. Districts should be interested because they need a strategy to attract and retain teachers and to get more from their induction dollars. States should be interested because their alternative strategies for improving public education have not succeeded, and their new labor force entrants are not prepared for the demands of today's jobs. The federal agencies should be interested because the paltry funding for research has demonstrated little impact on practice, and in the absence of impact Congress has been unwilling to support an expanded budget.

With a proof of concept in hand, there would be many possibilities for state and federal entities to structure the initiative. State funding formulas could be adjusted to provide districts with additional support for each teacher who is given an induction experience in an i2 Cluster. State universities and teacher preparation programs could also have their formulas adjusted to support participation.

At the federal level, strategies that support applications from states and districts for funds to carry out a proposed plan could be deployed. Title II of the Higher Education Act provides funding for partnerships between universities and school districts to collaborate on the training and support of new teachers. The \$43 million provided for that purpose pale in comparison to the \$16 billion in federal support for the training of new doctors. But the mechanism is in place for an expansion should policy makers find the case compelling (CRS, 2018; NEA, 2019).

The approximately \$16 billion in Title 1 funding that flows to the states is a second promising mechanism for support (Education Department, 2019). An expansion of those fund could be allocated with a fixed percentage increase for every i2 Cluster school, or for every Title 1 student who is educated in a Cluster school, just as teaching hospitals are paid a premium for every Medicare patient served.

Creating organizational structures that enable our best researchers and our most skillful practitioners to work together to build and improve professional practice and the knowledge base that supports it has the potential to address the capacity challenge that has undermined one policy initiative after another. And it is an investment strategy that will not only work for today, but one that can evolve to meet the unknown challenges of tomorrow. ♦

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