



Toward Teacher Education Research That Informs Policy

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This article investigates the extent to which researchers are currently engaged in a shared research program that offers systematic evidence of the classroom impact of organized venues (preservice as well as inservice) for teacher professional learning. The article stems from concern about policies rooted in suspicion that teacher education is either ineffective or tangential to improving outcomes for students, as well as earlier findings that far too little teacher education research has been designed to address that suspicion with data (Cochran-Smith & Zeichner, 2005; Yoon, Duncan, Lee, Scarloss, and Shapely, 2007). An analysis of 196 articles published in 2012 in four leading teacher education journals internationally found only 1% to report large-scale mixed-methods studies, only 6% to examine the impact of teacher education on teaching practice and/or student learning, and most of the rest to be conducted within rather than across silos. Three recommendations for strengthening teacher education research are offered.

Keywords: content analysis; mixed methods; professional development; program evaluation; research methodology; teacher education/development

Evidence, to the extent it is available, should guide decisions about policy and practice (Bridges, Smeyers, & Smith, 2008; Levin, 2004). When it comes to teacher education, however, there are heated debates about what counts as evidence and what the evidence indicates. At the preservice level, although some researchers found that teacher education makes no contribution to student learning (Johnson, 2000) or that what contributes significantly is subject matter preparation (Monk, 1994), others found that teacher preparation does indeed contribute to teacher effectiveness (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005). At the inservice level, although debates are less vigorous regarding whether teacher professional development matters, the current thrust of U.S. teacher evaluation policy focuses much more on measuring the extent to which teachers raise student test scores than on processes for helping teachers develop their practice.

The existence of too little systematic evidence examining the impact on students of organized venues for teacher professional learning enables policy advocacy based on ideology more than evidence. For example, building on the view that preservice teacher education does not improve student learning, the National Council on Teacher Quality (NCTQ, 2013) portrays teacher education as mired in mediocrity, using as evidence analysis of documents (such as syllabi and student teaching handbooks) from 608 teacher education programs. Notably, not only

were programs not visited but there was no follow-up on what graduates of programs do in the classroom. This study garnered considerable attention, however, for its large scale, its funding, and its connection with media, especially *U.S. News and World Report*. An ideology that devalues teacher professional learning underlies the rapidly escalating support for short routes into the teaching profession, and greater emphasis on using professional development to enforce mandates than to improve practice in areas teachers see as valuable (Zeichner, 2010).

The question this article addresses is, What kind of research in teacher education would best inform policy, and to what extent are teacher educators engaged in that research? I believe this is an urgent question because, in the absence of more compelling data, studies like the one just released by the NCTQ may lead to policy changes that actually undermine the quality of P–12 students' education. Although the shift toward evidence-based policy and practice might seem to support research on teacher education, the rapidly growing nexus between federal policymakers and philanthropists (Koppich & Esch, 2012) only adds to the urgency that teacher educators themselves be active shapers of a shared and usable research agenda on teacher education.

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Research Production and Policy Use

Levin (2004) argues that research in education can play a more significant role in policy and practice than it does currently, based on his international analysis of three areas: research production, user capacity, and linkages between the two. With respect to research production, he argues that research questions tend to be narrowly conceived around the interests of academic researchers, almost to the exclusion of those of potential users, which produces unevenness in what is researched and the extent to which research addresses questions potential users are asking. In their review of studies of practitioner use of education research, Helmsley-Brown and Sharp (2003) concur: "Practitioners are identified as seeking new solutions to operational matters whilst the researchers are characterised as seeking new knowledge" (p. 460). Further, Levin points out that most education research is small-scale and short-term, which feeds the perception among potential users that it is not very useful. Research produced by organizations such as think-tanks, interest groups, and companies tends to be directed toward specific issues of interest to the organization rather than toward broader knowledge production.

With respect to user capacity, Levin (2004) points out that most organizations that might use research findings have limited capacity to be involved in research partnerships or to interpret and use findings, which generally are written for academic audiences; Helmsley-Brown and Sharp's (2003) review concurs. As a result, potential users tend to rely on media reports or interpretations by third parties such as foundations that may have their own agendas, which supports the view that any position can be supported by research. With respect to linkages between researchers and potential users, Levin argues that, although they have been improving, they are still inadequate. A big problem is that generally academic researchers write for each other, rather than for practitioners or policymakers. Further, connections between researchers and users tend to be happenstance (based on personal connections), and researchers make insufficient use of third parties such as media.

This article focuses on research production in teacher education in relationship to its usability by policymakers and practitioners. Before turning to my analysis of studies, I consider what we know about the nature of research that might inform policy or practice. Given the current emphasis on raising student achievement levels, perhaps the greatest consensus is that research on teacher professional learning should provide guidance in that area. There is less consensus about the form or design research should take.

Internationally, policymakers have shifted toward systematic reviews to identify "what works" based on evidence (Bridges et al., 2008). In the United States, *No Child Left Behind* specified using "scientifically based research," which the Institute of Education Sciences operationalized as favoring randomized controlled trials to produced strong evidence. Slavin (2005), for example, contrasts education, in which changes in practice over time derive from factors other than evidence, with other fields: "The most important reason for the extraordinary advances in medicine, agriculture, and other fields is the acceptance by practitioners of evidence as the basis for practice" (p. 9), evidence

being based on experimental research. Other researchers, however, are skeptical of experimental research because it narrows considerably what questions can be addressed. Howe (2009), for example, stresses importance of balancing search for evidence-based practice with attention to normative questions about what is of value, ethical questions about what is fair, and social and cultural factors.

Views of policymakers and practitioners reflect a wider range of concerns. Nelson, Leffler, and Hanson (2009) conducted a combination of focus group and individual interviews with 65 leaders that included congressional staff members, deputy state commissioners of education, state education committee legislators, school board members, school district superintendents, and school district central office staff, to find out how they use research. Although these policymakers and practitioners reported valuing evidence, they distrusted much education research because one can find a study to justify almost any practice, and they particularly distrusted experimental studies, viewing them as too narrow. They said they paid most attention to evidence of interventions that can be applied systemwide, are locally relevant, and are sustainable; case studies and multiple linked studies help them consider interventions in relationship to their own local situations. Based on their review of use of research by practitioners, Helmsley-Brown and Sharp (2003) concur, pointing out that from practitioners' perspectives, knowledge that fits with local beliefs and has local utility is of most value.

These varied positions collectively suggest that education research most likely to influence policy (a) provides systematic evidence of the classroom impact of teacher education, particularly on student learning, (b) is of sufficiently large scale to suggest that the impact is not too idiosyncratic or localized to be of use elsewhere, and (c) combines methodologies that include both quantitative and qualitative data, enabling policymakers to "see" how a program or practice might interface with local realities, while also enabling them to assess its impact in clear terms. An important question, then, is the extent to which research in teacher education reflects these characteristics. Two recent research reviews suggest that fairly little has done so.

Almost a decade ago, on the basis of a 4-year review, the American Educational Research Association's Panel on Research and Teacher Education released the first major and comprehensive examination of the state of preservice teacher education research in the United States (Cochran-Smith & Zeichner, 2005). Zeichner (2005) described the panel's work as "analyzing the empirical research on the relationships between aspects of teacher education and teacher education policies and different outcomes: teacher recruitment and retention, teachers' own learning, teachers' practices, and student learning" (p. 738). The panel concluded that, for the most part, studies were not yet intentionally designed around a research program that examines not only connected aspects of teacher education but also its impact on both teachers and students. Although there are cohesive bodies of research in some areas of teacher education, such as math education, most studies had not been designed to build a systematic body of evidence, nor to link teacher education with its impact in the classroom. Based on an analysis of the panel's findings, Zeichner concluded, "The main issue in our view is to develop a research program in teacher education that can address

the variety of questions that investigators seek to answer about teacher education and its connections to various kinds of outcomes of importance to society” (p. 738).

In a comprehensive review of research on teacher professional development, Yoon, Duncan, Lee, Scarloss, and Shapely (2007) similarly found that too little specifically examines its impact on improving student learning. The authors reviewed more than 1,300 articles purporting to be about the impact of teacher professional development on student achievement. Only 132 turned out to report studies of professional development that included data. When the studies were carefully examined for research designs that directly connect professional development with its impact on student achievement, including reporting baseline student achievement data, only nine studies remained. Although these nine studies demonstrated that teacher professional development on the average boosted student achievement by 21 percentile points, the fact that there were so few such studies was of great concern.

Both of these reviews point toward a problem: although much research is produced about organized venues for teacher professional learning, most of it has not been designed to directly connect teacher professional learning with an impact in the classroom, particularly an impact on students. Further, as the AERA Panel on Research and Teacher Education pointed out, there does not seem to be a shared research program linking teacher education with improvements in classrooms that researchers are using to build a coherent knowledge base.

Since the release of these reports, have teacher education researchers begun to build a shared research program and systematic knowledge base about teacher professional learning from the preservice level through the teaching career, that includes the impact of teacher professional learning on students? If so, to what extent is any such shared research program designed to inform policy and practice?

Methodology

To gauge recent efforts within the teacher education research profession to build a shared research program and systematic knowledge base about teacher education and its impacts, I sought a sample of research articles. Although research on teacher education is published in many different journals, it is most clustered in teacher education journals. Because I wanted to survey the nature of current research to explore the extent to which a shared research program that can influence policy may be emerging, I selected for analysis all articles published in 2012 in the four teacher education journals with the highest impact factors in Education and Educational Research (Thomson Reuters, 2012). The journals, impact factors, and number of articles published in 2012 of articles were as follows:

- *Journal of Teacher Education* (impact factor rank 10): 30 articles
- *Teaching and Teacher Education* (impact factor rank 37): 114 articles
- *European Journal of Teacher Education* (impact factor rank 119): 28 articles
- *Asia-Pacific Journal of Teacher Education* (impact factor rank 212): 24 articles

In all, I examined 196 articles. Although most articles focused specifically on teacher education (preservice or professional development), several in *Teaching and Teacher Education* focused on classroom teaching with minimal attention to teacher education. However, because teaching and teacher education overlap, I decided not to exclude anything. I looked specifically at (a) research designs used and (b) research questions asked, particularly the extent to which research was situated within a broad and meaningful program of research that connects teacher education with its impacts.

Figure 1 illustrates a conceptualization of a holistic research program consistent with recommendations by the AERA Panel on Research and Teacher Education. This conceptualization links what happens in teacher education (preservice and/or professional development) with its impact on teachers and students in the classroom. Various kinds of impacts can be studied. Impact on teachers, for example, might be pedagogical (how teachers teach), but one can also study teacher knowledge, teacher attitudes, teacher identity development, and so forth. Similarly, impact on students can be conceptualized in multiple ways. Although student academic achievement is important, so too are other impacts, such as student well-being (socially, psychologically, culturally).

In what follows, I present (a) an analysis of the frequency of various research designs, (b) an analysis of studies that examine the impact of teacher education in the classroom, and (c) an analysis of the extent to which other studies are connected with a shared research program in teacher professional learning.

Research Designs in Use

I categorized the articles based on the research design used. Twenty-eight (14%) of the 196 articles did something other than report research: These consisted mainly of conceptual essays, theoretical analyses, and commentaries on other articles in the journal. The remaining 168 articles (86%) reported research articles that use the following designs: survey research; qualitative case studies; analysis of documents, videos, or discourse; small-scale experimental or quasi-experimental research; Q-sort methodology; and mixed-methods research.

Seventy-one articles (36%) reported survey research. Although most survey studies gathered data through questionnaires, a few used interviews similarly to paper-pencil or online surveys (such as interviewing more than 300 cooperating teachers regarding their role as mentor); one analyzed data from the Schools and Staffing Survey. The issue investigated most commonly was the relationship between teacher burnout and various factors, especially, sense of efficacy in the classroom (five studies). In addition, a few other surveys investigated teacher efficacy and teacher resilience, although not directly linked with teacher burnout; one thematic issue of *Teaching and Teacher Education* focused on this area. A thematic issue of *Asia-Pacific Journal of Teacher Education* reported several studies of why people enter teaching, surveys having been conducted in different countries using the same instrument (Factors Influencing Teaching Choice Scale). Examples of other questions the survey studies addressed are: how well university supervisors predict later teaching performance; teacher perceptions of new national curriculum

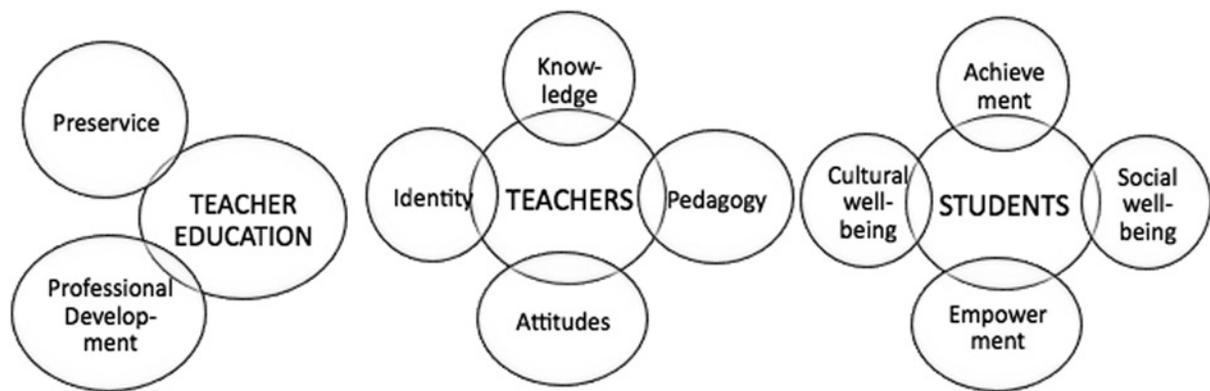


FIGURE 1. *Suggested Research Program in Teacher Education*

standards; perceptions of the trustworthiness of knowledge in various programs; and how length of student teaching affects sense of teaching efficacy. Two survey studies tested correlations between student achievement and some aspect of teacher education: which teacher education program in a U.S. state the teacher had completed (Gansle, Noell, & Burns, 2012), and teacher participation in professional networks (Moolenaar, Slegers, & Daly, 2012).

Fifty-eight articles (30%) reported small-scale qualitative case studies. The aspect of teacher education investigated most commonly was student teaching (five studies), such as how mentoring occurs in triad relationships, or how supervisors help student teachers adapt teaching to the classroom context. Examples of other questions are, how online learning is being used, how teacher networks sustain social justice teaching, how authority was negotiated in a teacher education course, and how small groups of teacher education students collaborated on an action research project. Two qualitative case studies examined the impact of teacher education on classroom teaching: Tripp and Rich (2012) investigated how teacher engagement in a semester-long professional development process of reflecting on videos of their own teaching affected their practice, and Butler and Schnellert (2012) investigated how three groups of teachers experienced an ongoing community of inquiry, and how their participation shifted their teaching practice.

Seventeen articles (9%) reported analysis of documents, videos, or discourse. Six involved processes in teaching or learning to teach mathematics, such as use of seatwork, anxieties regarding teaching math, helping students solve word problems, and design of floor plans that reflect NCTM standards. Examples of other topics are as follows: implications for raising consciousness about race based on analysis of written narratives of white preservice teachers, kinds of assertions teachers make in their talk, and how preservice teachers construct teaching in portfolios. None studied the impact of teacher education on classroom teaching or student learning.

Ten articles (5%) reported small-scale experimental or quasi-experimental studies. One study investigated the impact of professional development on teaching: Stanulis, Little, and Wibbens (2012) studied the pedagogical impact of coaches on beginning teachers' use of discussion strategies in the classroom. Three studies investigated the impact of teacher education (preservice or professional development) on student learning: two investigated the impact of teaching critical thinking at the

preservice level on K–12 students (Toy & Ok, 2012; Yang, 2012), and one investigated the impact of a professional development program in the teaching of writing on students' writing (Harris et al., 2012). The other six articles focused on other things, such as the impact on preservice science teachers of teaching evidential reasoning.

Five articles (2%) reported studies using Q-Sort methodology; none directly examined the impact on classroom teaching or student learning. For example, one study examined how a professional development program shifted 20 physics teachers' conceptions of force and motion.

Six articles (3%) reported small-scale mixed-methods studies. Two examined impacts of professional development on classroom teaching. Matsumura, Garnier, and Spybrook (2012) used an experimental design involving structured classroom observations, as well as interviews with coaches, to test the impact of a professional development program on a discussion-based approach to teaching literacy on students' reading comprehension. Lee, Kinzie, and Whittaker (2012) used an experimental design involving videos of classroom teaching and tests of student vocabulary, as well as data on professional development participation, to test the impact of online professional development in open-ended questioning strategies. Only two articles (1%) reported large-scale mixed-methods studies, the design most likely to influence policymakers. Armour and Makopoulou (2012) used 15 linked case studies across England, based mainly on interviews, to evaluate a nationwide professional development program. Bishop, Berryman, Wearmouth, Peter, and Clapham (2012) used a quasi-experimental design, as well as interviews and classroom observations, to examine the extent to which a professional development on culturally responsive and relationship-based pedagogy produced sustained changes in classroom teaching and impacts on Maori students.

Research on the Impact of Teacher Education

With respect to questions asked, I examined the extent to which researchers connected teacher education with its impact on teachers, and particularly what teachers do in the classroom, as illustrated in Figure 1. Of the 196 articles I reviewed, 11 (6%) reported studies on the impact of either preservice teacher education or professional development on teachers in the classroom and/or on students.

Four studies investigated the impact of teacher professional development on classroom teaching; all four found that the programs improved teaching. The mixed-methods study by Matsumura, Garnier, and Spybrook (2012) found that teachers in schools using the Content-Focused Coaching program, in which trained literacy coaches help teachers develop content-rich, high-quality discussions, engaged their mainly low-income ELL fourth- and fifth-grade students in considerably higher quality discussions than schools with literacy coaches not using this program. Similarly, Stanulis et al.'s (2012) experimental study found that beginning teachers who receive targeted coaching in facilitating classroom discussions do, in fact, facilitate more and better discussions than those whose coaches do not target this area. Tripp and Rich's (2012) case study of seven teachers found that reflecting on videos of their own teaching with colleagues enabled teachers to actually see problematic practices they then worked to improve. Finally, in Butler and Schnellert's (2012) qualitative case study of three groups of 18 teachers participating in a year-long community of inquiry, almost 90% reported changes in their practice, although because the study did not include classroom observations, one cannot say definitively what changes the teachers actually made.

Seven studies examined how teacher education impacted not only on teachers but also on their students; findings varied. Gansle, Noell, and Burns's (2012) survey study of students taught by graduates of 10 preservice programs in Louisiana did not find statistically significant student achievement differences between types of preservice programs but did find achievement differences associated with individual preservice programs. The study's design did not enable the researchers to identify why that was the case. Moolenaar, Slegers, and Daly's (2012) survey of the impact of teacher networks as a form of professional development and support, in 53 schools located in one school district, did not find a direct correlation between teacher networks and student achievement but did find that dense networks supporting a sense of collective efficacy among teachers within a school associated with student achievement gains. Both survey studies, which found a relationship between teacher education and student learning, would have benefited from using qualitative methods to illuminate how the most impactful programs worked (Kennedy, 2008).

Two studies of the impact of teaching teachers to develop students' critical thinking in the classroom had conflicting results. Toy and Ok's (2012) experimental study of the impact of preservice education in critical thinking in the context of vocational education found that although students of the experimentally trained teachers appeared to show more progress than students of traditionally trained teachers, results were not statistically significant. In contrast, Yang's (2012) experimental study of two junior high teachers who completed a preservice program that integrated preparation to teach critical thinking found that students in their classes achieved at higher levels than students in classes taught by two matched teachers without such preparation. Again, addition of qualitative research might have shown more about the program or classroom practice that could suggest why one study found a stronger impact on students than the other.

Harris and colleagues' (2012) quasi experimental study of 20 second- and third-grade teachers who participated in practice-based professional development for writing either stories or

opinion essays, found through pre- and posttests, that students made meaningful improvements in some aspects of their writing. Lee, Kinzie, and Whittaker's (2012) mixed-methods study of the impact of online professional development in open-ended questioning strategies resulted in participating pre-K teachers using more open-ended questions when teaching science than teachers who did not participate, and their students learning to use more words in more complex sentences than students of teachers who did not participate.

Finally, the large-scale mixed-methods study by Bishop et al. (2012) documented changes in classroom teaching that persisted over time produced by professional development in relationship-based pedagogy, and improvements in mathematics, reading, and other academic areas of the Maori students of participating teachers. This study used quasi-experimental research to compare student achievement in participating schools with nonparticipating schools, formal classroom observations of teachers participating in the professional development project, and a survey of teachers' perceptions of the professional development project. The study documented shifts in teachers' classroom pedagogy, sustained over time, that were associated with gains in Maori student achievement.

These 11 studies provide a window into the kind of research being done currently that examines the impact of organized teacher professional learning on what happens in the classroom. The studies themselves range in the strength with which they examine impact, from self-report to multiple data sources. Not all of these studies would have satisfied Yoon and colleagues' (2007) strict criteria for linking teacher professional learning with its impact on student learning. Most striking about these 11 studies, however, is their small number, given questions many policymakers have currently about the extent to which teacher education matters.

Researching Within More Than Across Silos

What of the remaining 80% of the articles reporting data, but not classroom impact of teacher professional learning? Although a few investigated the impact of teaching practices on student learning (such as use of differentiated instruction in rural schools [Smit & Humpert, 2012]), the majority examined processes internal to either preservice teacher education programs (such as use of action research in a teacher education course) or professional development programs (such as how teachers experience learning communities), or they examined characteristics of teachers (such as teacher resilience or anxiety teaching math). Although all studies were contextualized within bodies of research and theory, most were not explicitly connected with a larger, shared research program than links organized venues of teacher professional learning with impact on classroom teaching and student outcomes.

For example, consider 13 studies of various aspects of student teaching. Six were contextualized within literature on mentoring student teachers as they learn to navigate relationships between theory and practice or as they develop pedagogical complexity (Cheng, Tang, & Cheng, 2012; Koç, 2012; Rigelman & Ruben, 2012; Rozelle & Wilson, 2012; Soslau, 2012; van Velzen, Volman, Brekelmans, & White, 2012). Four

were contextualized within literature on the process of becoming a teacher, although they drew on different bodies of literature and their foci differed, such as how student teachers perceive teaching practice (Caires, Almeida, & Vieira, 2012), or how cooperating teachers affect student teachers' beliefs and practices (Rozelle & Wilson, 2012; see also Lopes & Pereira, 2012; Soslau, 2012). Professional identity formation served as a related contextualization for a study of emotions during student teaching (Timoštšuk & Ugaste, 2012), and of identity development across historical periods of teacher education (Lopes & Pereira, 2012). Three studies addressed other issues: student teachers' emotional intelligence, contextualized within literature about why teachers burn out (Corcoran & Tormey, 2012); the relationship between teacher candidates' sense of efficacy and the length versus quality of student teacher program, contextualized within policy discussions about student teaching (Ronfeldt & Reininger, 2012); and how special education student teachers in three countries with different policy contexts view inclusion (Takala, Hausstätter, Ahl, & Head, 2012).

Of these 13 studies, only Rigelman and Ruben (2012) explicitly situated student teaching processes within a conceptual framework that links the learning and development of teacher candidates with that of teachers and students. A few other studies implied such a link, such as Rozelle and Wilson's study of science teacher candidates that included data on interactions between student teachers and students. Several studies of student teaching did not mention P-12 students at all. Researchers may simply take for granted that students benefit from teachers who have productive student teaching experiences, have developed a professional identity, or are emotionally mature. The problem is that although it may be obvious to researchers why specific research questions matter in relationship to improving the quality of classroom teaching and student learning and development, connections between teacher education, classroom teaching, and student learning are usually implicit rather than explicit. For research to inform policy decisions about teacher education, implicit connections are simply not enough.

In addition, given the increasing racial, ethnic, and linguistic diversity in classrooms not only in the United States but in countries around the world, I was surprised to see the student teaching research give so little attention to complexities in learning to teach diverse students well. The almost complete absence of attention to student diversity in this sample of research studies provides an example of mini-silos in teacher education research in which, for example, some research communities work on diversity, others on subject matter pedagogy, and yet others on student teaching.

I offer this analysis of student teaching research to illustrate a larger problem: much research in teacher education occurs within rather than across silos or communities of interest. Yet, classroom teaching involves an integration of various issues. Teachers do not just teach reading, or fifth-graders, or social justice, or English learners, or standards; they do all of these things simultaneously. A strong program of teacher education research would need to entail collaboration across silos so that research addresses complexities of learning to teach more effectively and powerfully.

Toward Research That Can Influence Policy

Levin's (2004) model of research impact on policy includes three elements: production of research, research use and users, and connections between research production and its use. This article has focused on the first of these elements, because that is what teacher education researchers have most control over. A large problem Levin noted with research production in education was its framing of questions and research agendas almost exclusively around the interests of academic researchers to the near exclusion of policymakers and practitioners. Although he noted that in most fields, including education, there is tension between production of knowledge for application versus for building a knowledge base, research in education is highly skewed toward the latter at the expense of the former.

In this article, I ask the extent to which research in teacher education (preservice through professional development) is designed to influence policy. Specifically, to what extent does it reflect a research program that connects teacher education with its impacts in the classroom, provide data sufficiently large in scale to suggest application outside the context of the study, and include data that not only demonstrate impact but also show what a given program and its impact looked like in practice? I pose this question out of concern for policies and practices that are rooted in a suspicion that organized venues of teacher professional learning are either ineffective or tangential to improving outcomes for students, as well as concern that far too little teacher education research in the past has been designed to address that suspicion with data (Cochran & Smith, 2005; Yoon et al., 2007). The purpose of a viable research program on teacher professional learning would not simply be to answer "yes" or "no" regarding its value but rather to tease out the nature of programs and practices that matter most.

Of the 196 articles published in 2012 in the four journals I analyzed, I did not see evidence of an emerging, shared research program designed to inform policy. Only about 1% of the articles reported large-scale mixed-methods studies, only 6% examined the impact of teacher education on teaching practice and/or student learning, and only one did both. Although other large-scale mixed-methods studies that connect teacher education with classroom impacts exist (e.g., Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Brouwer & Korthagen, 2005), they are few and far between.

The great majority of the research studies I analyzed were small in scale and, more importantly, not designed to connect directly with a larger program of research outside the specific community of interest of the researcher (such as teacher identity or science methods). Although some survey studies were large in scale, they focused much more on characteristics of teachers than on the impact of teacher education. Experimental studies, although about half having been designed to assess the impact of teacher education, were small in scale and their lack of qualitative data leaves readers with only a sketchy idea of details that would help visualize the applicability of findings to local contexts. If designed to inform each other, however, studies using different methodologies can build a coherent knowledge base. In her review of the contribution of qualitative research to research on teacher education, Kennedy (2008) noted that such studies

illuminate detail that quantitative search cannot capture and have the capacity to help establish causation by looking “at practice as it unfolds” (p. 364).

I do not mean to suggest that all teacher education research should be designed to inform policy. Indeed, research offers powerful insights about many issues, such as why people enter teaching and what makes them stay or leave. The problem, however, is that the weight of the research, being fragmented, often narrowly focused, and usually not directly connected to a shared research agenda on teacher education, does not position teacher educators strongly to craft an evidence-based narrative about teacher education that might counter policies or reports like the NCTQ’s.

I offer three suggestions as a way forward. First, teacher education organizations should collaborate on explicating a research agenda that links teacher education with its impact on teachers and on students, as had been recommended by the AERA Panel on Research and Teacher Education. Researchers should then, whenever possible, link their work explicitly to that agenda, for example, by following teachers in their workplaces after completion of the preservice or professional development program being studied, so as to generate much-needed evidence of classroom impacts of various configurations of teacher education.

Second, the culture of teacher education needs to shift toward more preparation for and rewarding of research that contributes to building a knowledge base (e.g., reward in terms of gaining name recognition, jobs, and publications). For example, studies are frequently justified on the basis of filling a gap in the literature by offering something novel, rather than on the basis of confirming existing research findings or replicating another study. Researchers commonly conduct limited rather than comprehensive reviews of research studies similar to their own, leading to some of the same questions unknowingly “rediscovered” repeatedly, whereas questions begging research remain underresearched. Teacher educators might require graduate students and beginning researchers to ground their work in comprehensive, systematic reviews of the literature, and then reward those who can demonstrate how their work contributes to a shared knowledge base.

Third, there should be much greater emphasis on collaboration among researchers. A problem resulting from lack of significant funding but the need for researchers to publish is a proliferation of case studies of individual courses. As an alternative, researchers can conduct linked small-scale studies that, when synthesized, result in large-scale research (Levin, 2004). For example, researchers in different geographic locations or higher education institutions, with careful planning and coordinating, could carry out linked small-scale studies that ask the same questions and use the same methodology. Armour and Makopolou’s (2012) evaluation of a professional development program by conducting 15 linked case studies across England offers an example. In addition, the field would benefit from more research conducted by teams who bring diverse forms of expertise. Mixed-methods research means more than adding interviews to a study designed through an experimental design logic, or adding numerical data to a qualitative case study; doing it well requires the expertise of a diverse team. Similarly, cross-cultural research teams bring more insights relevant to education of diverse student populations than culturally homogeneous

teams or individual researchers. Interdisciplinary teams bring areas of expertise that enable a more complex rendering of teaching and learning than those from one discipline. These various suggestions offer a way forward toward the development of a shared research program that can influence teacher education policy.

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