Teacher Education: Expanding the Intersection of Evidence and Policy

Julie Cohen and Jim Wyckoff
University of Virginia
June 8, 2016

Recent educational policy efforts have targeted improving teacher quality. We know effective teachers are essential for improving student outcomes, and states and districts have tried varied approaches to developing a stronger teaching workforce. Teacher education should be an important element of these efforts, but there is surprisingly little evidence about how to design effective preparation programs.

A series of blue-ribbon commissions and academic research acknowledge that teacher education is often composed of a highly varied set of policies and practices. There is scant evidence that licensure exams, specific coursework, graduate degrees, different routes into teaching, or typical clinical experiences improve outcomes for teachers or their students

In the absence of strong evidence, policymakers in states, school districts and teacher preparation programs have piloted modifications to traditional teacher preparation to meet their needs to increase the number of effective teachers. SREB states have been among the leaders in some of these efforts. Some of these pilots appear promising and deserve broader dissemination. We highlight three illustrative promising practices:

- ✓ *Data Systems to Inform Improvement*
- ✓ *Revised State Licensure Requirements*
- ✓ *High-Quality Clinical Experiences*

Finally, we note that the context for teachers and teaching varies widely across and within states. For many schools the labor market for effective teachers is very constrained, especially in some subjects. Other schools face a surplus of effective applicants for vacant positions. Nationwide, applicants to teacher preparation programs have declined. These conditions often result in a tension between efforts to minimize entry barriers into the profession to increase the pool of prospective teachers, and simultaneous calls to increase standards in an attempt to enhance teacher quality. State licensure policies and the requirements for teacher education programs have the potential to exacerbate or ease these labor market dynamics.

Several SREB states are pursuing some of the promising practices outlined above, which provide opportunities to build more robust systems of teacher education. Realizing the promise of these initiatives will require careful development, implementation and evaluation of these policies.

Julie Cohen and Jim Wyckoff of the University of Virginia, consultants to the SREB Teacher Preparation Commission, prepared this paper for the Commission's June 2016 meeting.

The Importance of Evidence

Teachers matter. Evidence suggests that teachers are the single most important school-based lever for improving student outcomes in both the short and long term (Chetty, Friedman, & Rockoff, 2014). We also know that all teachers are not equally effective (Rockoff, 2004). Many states experience substantial variation in teacher quality, which exacerbates differences in student achievement and later life outcomes. The question then becomes how do we recruit and prepare large numbers of "effective" teachers?

Teacher preparation has the potential to profoundly improve teacher effectiveness and student outcomes. To date we have only limited evidence of the practices that realize this potential. Policies governing teacher preparation vary widely across states, are poorly informed by data and evidence, and are typically not structured to facilitate improvement. Historically accreditation and licensure requirements have focused on program inputs, such as courses taken, rather than program results. Teacher education programs do not use common outcome measures, which further limits the potential for comparisons of graduate effectiveness.

Rigorous evidence is essential. For example, despite the obvious conceptual appeal, the overwhelming conclusion of rigorous research is that an MA in education does not result in more effective teachers. It may be that graduates of some MA programs indeed are more effective, but merely requiring a master's degree, as eight states currently do, is likely a waste of valuable resources and time.

Lacking the adequate data, too many policies privilege measures that have intuitive appeal but little to do with improving teacher performance. Quite simply, intuition and personal anecdotes are not just unhelpful; they often move us further from improved student outcomes than no policies at all. As a result, too many teachers enter classrooms ill-equipped to teach effectively. Teachers do improve "on-the-job," but not until several cohorts of students have potentially received substandard instruction.

Several states are exploring policies to mitigate this wasteful process and support meaningful and ongoing improvements in teacher education. In this paper, we explore the available evidence on components of teacher education, the current structure of teacher education in SREB states, and a few illustrative promising practices that could inform more thoughtful development of teacher education policy.

The Makeshift Landscape of Teacher Education

Teachers are prepared by more than 2,000 providers across the United States. There are vast differences among these providers in the focus and intensity of coursework, fieldwork, and assessments. In particular, many highlight the differences between traditional preparation programs, which lead to university degrees, and alternative certification programs (e.g., Teach for America), which are typically short (e.g., six weeks) but intense. Even this distinction misrepresents variation within each pathway. For example, several states, such as New York, require alternative route teachers to earn a master's in education during the first few years of their careers.

Some contextual features are worth noting when considering the landscape of teacher preparation in America:

- Currently more than 80 percent of prospective teachers graduate from university-based preparation programs. Only 10 to 15 percent of program completers are prepared in alternative routes, but in some states, such as **Louisiana**, it is greater than 50 percent (see Appendix Table 1).[1]
- State policymakers set teacher certification and licensure requirements to insure all teachers have some common set of training experiences. These requirements vary widely across states, but typically include coursework, student teaching, and licensure exams intended to measure teacher candidates' understanding of relevant content and pedagogy. (Specific examples of this variability are provided for SREB states below.)
- Compliance with accreditation requirements often limits structural variance between programs. Many university based programs, for example, "look the same" based on course requirements. Some argue that these state or federal requirements limit innovation in program design.
- Structural similarities may mask differences in the sequence or quality of the coursework or fieldwork available within or across different programs.
- In certain fields (STEM, special education), we are facing dire teacher shortages. There is a tension between higher standards for teacher preparation in an attempt to improve student achievement and a pressing need to recruit more teachers. This tension is further complicated by the myriad goals often ascribed to teacher preparation, including achieving a diverse teacher workforce.
- For accreditation purposes, most preparation programs collect data about program requirements and to some extent the performance of graduates. However, such data is often idiosyncratic to the program and of little use in comparing programs or assessing the effectiveness of program characteristics.

Many of these requirements make intuitive sense. For example, prospective physics teachers must take physics courses. However, there is often little evidence to confirm that these requirements improve teacher effectiveness. In some cases, the evidence suggests ill-informed policies have reduced teacher quality by screening out otherwise effective teachers, as noted above with states requiring teachers to earn a master's degree before receiving full state certification. There is a tension between using certification requirements in an attempt to raise teacher effectiveness and the potential that such requirements inappropriately reduce teacher supply.

[1] Authors calculation based on U.S. Department of Education Title II data downloaded at https://title2.ed.gov/Public/Home.aspx .

Too Little Evidence

"There is currently little definitive evidence that particular approaches to teacher preparation yield teachers whose students are more successful than others…" (National Research Council, 2010)

Teacher preparation begins with the selection of candidates for preparation programs and continues through coursework, pre-service student teaching, and early career experiences like induction, mentoring, and professional development. Some experiences are more formal or structured than others, but all are intended to provide teachers with knowledge and skills that promote effective teaching.

The evidence on practices in teacher education that make a difference, whether measured by assessments of teacher effectiveness or by demonstrated ability to improve student outcomes, is very thin. Below we examine the currently available evidence for each of the major components of teacher preparation.

Selection of Teacher Candidates and Teachers

Most states require prospective teachers to exceed some threshold requirements in pedagogy and content to become teachers. Unfortunately, to date, few of these requirements have been linked to more effective teaching on-the-job. A new wave of requirements grounded in practice offer promise.

Teacher selection occurs at multiple stages—at entry to teacher education, during teacher education, and at entry to full-time teaching. The only evidence on the effects of selection at entry to preparation programs comes from Teach for America (TFA), which focuses on identifying candidates who will become strong teacher-leaders. TFA employs an extensive and rigorous screening process that selects roughly one in ten applicants. Dobbie (2011) finds the criteria on which TFA selects its candidates are associated with meaningful gains in student achievement once these candidates become classroom teachers. The lack of research on selection into traditional teacher education is an important gap in knowledge that may reflect few systematic efforts to differentiate among applicants.

We are unaware of any research that examines the effect of "performance screens," or measures designed to identify and remove teacher candidates during preparation programs. However, this would seem to be an important stage in teacher development when teacher educators and mentors in field placements might help identify areas for improvement and cases when a candidate should exit teacher preparation entirely.

There is more robust research examining the effects of teacher candidates' attributes in the hiring process.

- Traditional credentials such as academic background certification exam scores and certification status, masters degrees and college entrance exam scores individually provide weak signals of future productivity. (Kane, Rockoff & Staiger, 2008 Clotfelter, et al., 2007; Harris & Sass, 2011)

- When taken together, these attributes provide a stronger, but still modest, signal of teachers' ability to improve student achievement (Boyd, Grossman, Lankford, Loeb & Wyckoff, 2006; Clotfelter et al., 2007).
- Some studies have moved beyond these qualification-based measures of teachers to explore how leadership and personality traits such as perseverance may predict future effectiveness (Rockoff & Speroni, 2010; Rockoff, Jacob, Kane & Staiger, 2011; Duckworth, Quinn & Seligman, 2009). These too are associated with only modest gains in student achievement.
- Very recent work suggests that qualifications such as undergraduate GPA and screening measures, such as a mock teaching lesson, predict teaching effectiveness very well (Jacob et al., 2016). This is quite suggestive of factors that could be employed not only at hiring but also at licensure and during teacher education. In addition, a newly released study finds that passing edTPA, a certification exam employed in several states, is predictive of student achievement scores in English language arts once teachers are on the job, but not of student math achievement (Goldhaber, Cowan and Theobald, 2016).

We also know that teachers learn a great deal "on the job" (summarized in Atteberry et al., 2015), which theoretically, they would be better served learning in their preparation programs. We might hypothesize that particular programs or training methods help explain the variation we know exists among teachers. The extant literature is, unfortunately, thin and largely inconclusive about which features of preparation are associated with differences in outcomes.

Routes into Teaching

Knowing a prospective teacher's preparation route or program is not a reliable indicator of his or her effectiveness in raising student test scores. This strongly suggests that policymakers should focus on components of teacher preparation, not routes or programs.

The relative effectiveness of alternative certification versus traditional teacher preparation routes has been the focus of much research. While findings vary slightly in different studies, differences *within* traditional and alternative preparation routes are far greater than the differences between programs. (Boyd et al., 2006, 2009; Constantine, et al., 2009; Henry et al., 2014; Kane, Rockoff, and Staiger, 2008). For example, a rigorous study of the Boston Teacher Residency (BTR), found that the variation in performance among BTR graduates and traditionally prepared Boston teachers is far larger than the differences in average performance between the two groups (Papay, West, Fullerton, & Kane, 2012).

Some studies suggest individual programs may be associated with differential effects on student achievement (Gansle et al., 2012; Goldhaber et al., 2013; Koedel et al., 2015; Lincove et al., 2013; Mihaly et al., 2013). However, it is difficult to determine policy implications of these findings, as there is not a consistent pattern among the characteristics of differentially effective programs.

Coursework and Content Knowledge:

If teacher education makes a difference for novice teacher readiness, then one would imagine the sequence or content of coursework would also prove consequential.

Law and medical schools have common curricula taken in specific sequences. Teacher preparation programs have no such consistency, and comparatively few studies have linked course taking to outcomes.

Some studies that find that strong content knowledge (e.g., Hill, Rowan, and Ball, 2005) or teaching methods (Boyd et al., 2009) may predict improved student performance. Others find little or no relationship between course taking in teacher education and student outcomes down the road (e.g., Harris and Sass, 2007; Henry and Bastian, 2015). There is, however, suggestive evidence that stronger methods preparation may increase teachers' perception of readiness to teach and retention (Ingersoll, Merrill, and May, 2012; Ronfeldt, Schwartz, and Jacob, 2014). Given the high costs of teacher turnover, such outcomes are important.

Drawing from international evidence, countries whose students perform well on international proficiency tests require teachers to have deep content knowledge. However, there are many other factors that distinguish teacher preparation and teaching in these countries from the context in the U.S., so it is difficult to draw conclusions relevant to policy from such comparisons.

In sum, there is strong intuition and suggestive evidence that teacher education coursework and teacher's content knowledge may improve student achievement and teacher retention. There is also evidence that the coursework provided in many typical teacher education programs makes little difference for student outcomes. This suggests that states and preparation programs could design courses that make a systematic difference in increasing teacher effectiveness.

Clinical Experiences

Practice teaching in real classrooms is a hallmark of traditional teacher education. Clinical experiences such as student teaching allow teacher candidates to refine their skills with supervision and support. There is increasing evidence of the benefits of specific types of field experiences.

Several teacher education programs insist on well designed and supervised field experiences. Research is showing that high-quality field experiences can make an important difference in teacher effectiveness when candidates take their first teaching position.

First, novices benefit most from the guidance of an effective mentor teacher whose instructional approach is aligned with the approach advocated by the teacher education program (e.g., Boyd et al., 2009; Ronfeldt, Reininger, and Kwok, 2013). Second, teachers seem to benefit from student teaching in schools with similar student populations as the schools in which they intend to work (Goldhaber, Krieg, & Theobald, 2016; Ronfeldt, 2015). In other words, the "match" does seem to matter. Finally, there is evidence that those who student-teach in schools with lower levels of teacher turnover are more effective and to stay in teaching longer (Ronfeldt, 2012; Goldhaber et al., 2016). Despite this potentially promising evidence, research suggests preparation programs do not use these criteria in selecting field placement sites (Ronfeldt, 2015).

Much recent innovation in teacher education has focused on clinical experiences. The urban teacher residency model has spread rapidly in the last ten years from three programs in Boston, Chicago, and Denver to scores of residencies nationwide (Sawchuk, 2011). On some measures, these programs perform quite well. An analysis of the Boston Teacher Residency, for example suggests that BTR graduates stay in the district substantially longer than other novice teachers and are far more racially diverse than other Boston public school teachers (Papay et al., 2012). That said, BTR graduates are no more effective at raising student test scores than other teachers with the same level of experience in ELA and substantially less effective in mathematics (Papay et al., 2012).

A number of university-based preparation programs are partnering with districts to prepare novices who better support local needs. The success of these models is predicated on effective collaborative, including data sharing about program graduates (Education First). While this model holds a great deal of conceptual promise, to date, little empirical research has examined the outcomes of such programs.

Policy Variability in SREB States

SREB states vary widely in their teacher licensure and teacher education policies and practices. Some variability responds to differing needs and context. Much can be learned from careful comparisons of these differing policies and practices.

There is tremendous variation in the staffing demands and the teacher labor market characteristics across and within SREB states. The population of prospective teachers looks remarkably different in the DC suburbs of northern **Virginia** than in rural **Alabama**. As such, different states have developed distinct approaches to preparing and licensing teachers. We detail some notable similarities and differences in teacher education practices and licensure requirements across the 16 SREB states (see Appendix Table 1 for a summary of licensure requirements in SREB states).

The 16 SREB states have notably different licensure requirements and vary substantially in possible pathways or routes into the profession. **Virginia,** for example, primarily recruits through university-based programs. Except for a small program designed for career switchers, the vast majority of prospective teachers in **Virginia** move through a traditional sequence of coursework and university supervised clinical experiences. In sharp contrast, alternative pathways proliferate in **Florida** and **Louisiana**. These include combinations of coursework at community colleges and clinical experiences, and entirely web-based preparation programs.

In many ways, the SREB states represent the national shift from university-based preparation to more diverse structures and pathways for teacher education. The majority of SREB states have existing partnerships with long-standing alternative route programs such as Teach for America (**Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, Tennessee, Texas**). There are 16 distinct regions served by TFA in the southeast, far more than any other region in America. Several SREB states, including **Delaware, Louisiana** and **Tennessee**, have created residency programs that are district specific. Teach NOLA, for example, is an alternative route program organized through the New Teacher Project.

SREB states also offer more streamlined alternative route approaches. Six SREB states—**Arkansas, Florida, Mississippi, Oklahoma, South Carolina,** and **Tennessee**—partner with the American Board for Certification of Teacher Excellence (ABCTE), an entirely web based accreditation program that advertises as "costing less than a single university-based teacher preparation course." Prospective teachers work through a self-paced, self-guided program that culminates with two multiple-choice assessments. The program is designed to address specific needs in the teacher workforce: more than 20 percent of the program graduates are non-white and approximately a third go into STEM fields. Principals report that ABCTE prepared teachers are equally effective as those who come through other routes. However, little empirical research has examined the outcomes of the program.

SREB states also vary substantially in terms of certification requirements. For example, **Arkansas** has a summer online course for certification along with a community college program that certifies teachers after nine Saturday sessions. This is quite different from states like **Delaware** or **Maryland** that have several alternative routes to licensure explicitly designed to address teacher shortages, but also require substantial coursework, supervision, and coaching despite the expedited pathway into the classroom.

There is also substantial variation in how SREB states are assessing and comparing teacher preparation programs in their states. In **North Carolina**, UNC Chapel Hill tracks all preparation programs in the state, including alternative route and university-based providers. **Tennessee and Louisiana** publish annual report cards of preparation programs that include impact on student outcomes. The majority of SREB states, however, do not publish information comparing different programs.

Many SREB states require state-specific tests for licensure, including **Virginia, Texas, Florida, Georgia,** and **Oklahoma**. States also have varied expectations around reciprocity, including different expectations around levels of experience teaching in other states. The only easy route to reciprocity across the 16 states is National Board Certification, which is relatively rare and requires years of experience far exceeding the national average. This makes license reciprocity and/or moving between states expensive and time consuming, perhaps creating a barrier to entry for states looking to attract new talent.

The clinical requirements for licensure in the SREB states are hard to determine, but also seem to vary within and across states. Many states--**Texas, Tennessee, Mississippi, Arkansas,** and **Alabama--** allow individual programs to determine what constitutes adequate experience in classrooms. Most states note that for alternative route programs, the first year teaching serves as an "internship" year, though there are seemingly few state-level requirements in terms of supervision or coaching in those internships (see Appendix Table 1 for details by SREB state).

Several states have begun requiring edTPA, a writing-intensive performance assessment for licensure. **Delaware, Georgia,** and **Tennessee** are developing policies requiring prospective teachers complete this assessment as a component of licensure. **West Virginia** and **Alabama** are also considering implementing similar policies. All the SREB states except for **Kentucky** have some teacher preparation programs that require edTPA for graduation. It is not yet clear the degree to which these new licensure assessments will shift teacher effectiveness in these states.

Different states approach levels of certification differently. Some, such as **Oklahoma** and **Texas,** only have certification at entry for the duration of a teaching career. Others have tiered licensure

based on: graduate coursework and years of teaching experience, teacher evaluation and student achievement data, and/or years of experience. In some states, teachers at higher tiers of certifications have higher salaries and/or additional responsibilities, such as mentoring or coaching (see Appendix Table 1 for details by SREB state).

Promising Practices: Towards Evidenced-Based Policies

Promising practices offer opportunities to build a culture of evidenced-based policies that address the varied needs of teachers and students.

As we have described, evidence on which to construct rigorous state policies for teacher certification and preparation is currently lacking. In the absence of strong evidence, policymakers in states, school districts and teacher preparation programs have piloted modifications to meet their needs for increasing numbers of effective teachers. Some of these pilots appear promising and deserve additional scrutiny. In other cases, individual research teams have worked with states or districts to collect systematic data connecting features of teacher preparation to outcomes such as student achievement.

Below we highlight three such promising practices that we see as illustrative of these efforts, but by no means exhaustive. We feature practices that are substantiated by large- scale descriptive data. We caution that while these practices do have an empirical basis, the extant evidence is not causal and does not rule out competing explanations for specific findings. Before states or districts make large-scale policy decisions, more robust and rigorous evidence of the effects of specific practices on student outcomes is warranted.

Data Systems to Inform Improvement

The most promising ingredient for improved teacher preparation is the systematic development of relevant data. Teacher education programs, state certification offices and school districts have little to no comparative information regarding preparation candidates and graduates. As a result, there is little basis on which judge performance and make corresponding adjustments.

Building a robust understanding of how and for whom teacher preparation "works" is predicated on developing rich and sustained data systems about prospective teachers as they move through teacher preparation and into the field. What we know is very limited because data on teacher candidates and graduates is often housed in various locations

UNC Educator Quality Dashboard

The UNC Educator Quality Dashboard serves as an interactive on-line tool for viewing and analyzing data reflecting our progress towards the goal of augmenting the quantity and quality of public school educators serving our state's students. The dashboard allows for increased transparency and ease in data access for education stakeholders, including educators, administrators, policymakers, parents, and students. The key outcome and performance indicators reflected in the dashboard provide data for each program on: Recruitment and Selection, Educator Preparation, Performance and Employment, and University-School Partnerships. The system is available at: http://eqdashboard.northcarolina.edu/

and rarely assimilated, precluding a good understanding of the links between preparation and later career performance. States often control a variety of data that would allow the state and preparation programs to make evidence-based decisions about the focus and content of their programs. This information should include data for each program such as:

- ✓ required admission credentials,
- ✓ licensure exam results,
- ✓ enrollment,
- ✓ structure of clinical experience,
- ✓ student attributes of teaching position,
- ✓ teacher effectiveness on multiple measures including classroom observations and student outcomes, and
- ✓ teacher retention.

For example, the University of North Carolina teacher education schools have implemented such a system (see textbox). Louisiana also employs evidence on teacher effectiveness on the job to inform its review of programs. This has allowed these states to compare programs on common metrics and make these data available to prospective teachers and school districts recruiting recent graduates of these programs.

Revised State Licensure Requirements

There is ample evidence that licensure requirements that rely on traditional certification exams of general content knowledge or pedagogical skills have little connection to the effectiveness of classroom teachers. As a result, many states are exploring the use of more practice-based alternatives. Some states are using more rigorous exams from the Academic Literacy Skills Test, designed to align with tougher college and career-readiness standards for students, to a more challenging Praxis core assessment. edTPA, described above, is designed to be more closely connected to the work of teaching. Prospective teachers video tape several lessons in real classrooms and provide extensive written reflection on their instruction. edTPA is touted as providing an authentic window into teaching practice and an effective determinant of whether a candidate is "safe to practice." As such, it is being used for consequential decisions in many SREB states and around the nation. Despite these sweeping changes in licensure requirements, there is only some evidence that passing any of these newer, more challenging exams is predictive of future effectiveness. Recent evidence from Washington State, where edTPA is consequential for licensure, suggests that those who pass edTPA have a greater impact on student achievement in reading (Goldhaber, et al., 2016). However, the same study concluded that passing edTPA was not associated with improving student outcomes in math.

There is, however, also increasing evidence that these shifts in licensure requirements negatively impact the diversity of the teacher workforce. For example, New York requires several new licensing exams, which only 41 percent of black candidates and 46 percent of Hispanic candidates passed on their first attempt, compared with 64 percent of white candidates (Harris, 2015). As SREB states are implementing many of these tests, they have a unique opportunity to examine how these tests influence teacher effectiveness and other outcomes, including the diversity of the teacher workforce.

We expect the landscape of licensure exams to continue to shift in coming years. ETS has partnered with the University of Michigan to design NOTE, a high-tech performance assessment in a simulated classroom environment. Candidates will be asked to demonstrate high-quality use of teaching practices with student avatars. Determining the degree to which and ways in which these new assessments serve as effective performance screens is essential before radically redesigning state licensure requirements.

High-Quality Clinical Experiences

Providing teachers with high-quality clinical experiences is one of the few conclusive implications of the extant research on teacher preparation. Rigorous studies of teachers in New York City (Ronfeldt, 2012) and Washington State (Goldhaber, Krieg & Theobald, 2016), for example, have demonstrated the value of placing student teachers in schools with low teacher turnover and matching student teachers with mentors who teach in settings similar to those in which they anticipate teaching. Though some individual programs use these and other criteria to carefully place candidates in schools likely to foster their success, no states to our knowledge have policies in place that make such experiences the norm. Given the limited duration of teacher education, programs would be well served to think strategically about using student teaching to cultivate the knowledge and skills prospective teachers will need in the specific kinds of schools in which they anticipate working.

Several efforts are currently underway that will better define the most crucial elements of high-quality field experiences. For example, the Massachusetts Department of Education is working with its preparation programs to develop high quality field experiences and measure their effects.

Summary

Many have looked to teacher education as one component of a larger strategy to build a more effective teaching workforce to address long-standing problems of inadequate student achievement and the gaps in achievement by race and income. There may well be teacher education programs that have realized this objective, but there is no systematic evidence that documents the elements of such programs or their effects. More importantly, we do not yet have clear evidence about specific approaches to preparing effective teachers. We also have multiple, sometimes competing outcomes for teacher preparation. Policies that alleviate current teacher shortages by reducing barriers to entry, for example, may simultaneously negatively impact efforts to raise standards for teachers. Conversely, mandating new, more rigorous licensure exams without clear evidence about their reliability or validity may exacerbate teacher shortages and reduce the diversity of the teaching workforce.

To avoid developing policies with unintended consequences, we must think strategically about how to build a more robust research base about teacher preparation. In particular, how do we build capacity and data systems that allow us to compare the effectiveness of graduates from different programs? How do we foster risk-taking and innovation among teacher education programs while maintaining consistent standards for licensure and accreditation? How do we recruit high numbers of new teachers while trying to raise standards for entry into the profession?

There are no easy answers to these questions, but engaging in discussion about them is vital to building a stronger system of teacher preparation. The promising practices outlined above, many of which are being pursued by SREB states, provide opportunities to build more robust systems of teacher education. Doing so requires careful development, implementation and evaluation of these policies.

Julie Cohen and Jim Wyckoff of the University of Virginia, consultants to the SREB Teacher Preparation Commission, prepared this paper for the Commission's June 2016 meeting.

References

Atteberry, A., Loeb, S., & Wyckoff, J. (2015). Do first impressions matter? Predicting early career teacher effectiveness. *AERA Open, 1*, 2332858415607834.

Bastian, K. C., & Henry, G. T. (2015). The apprentice pathways to the principalship and student achievement. *Educational Administration Quarterly, 51*, 600-639.

Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis, 31*, 416-440.

Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2006). How changes in entry requirements alter the teacher workforce and affect student achievement. *Education, 1*, 176-216.

Boyd, D., Lankford, H., Loeb, S., Rockoff, J., & Wyckoff, J. (2008). The narrowing gap in new york city teacher qualifications and its implications for student achievement in high-poverty schools. *Journal of Policy Analysis and Management, 27*, 793-818.

Chetty, R., Friedman, J. N., & Rockoff, J. E. (2013). Measuring the impacts of teachers I: Evaluating bias in teacher value-added estimates (Working Paper No. 19423). Retrieved from National Bureau of Economic Research website: http://www.nber.org/papers/w19423

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). Teacher credentials and student achievement: Longitudinal analysis with student fixed effects. *Economics of Education Review, 26*, 673-682.

Committee on the Study of Teacher Preparation Programs in the United States. (2010). *Preparing teachers: Building evidence for sound policy*. Retrieved from http://www.nap.edu/catalog/12882/preparing-teachers-building-evidence-for-sound-policy

Constantine, J., Player, D., Silva, T., Hallgren, K., Grider, M., & Deke, J. (2009). *An evaluation of teachers trained through different routes to certification. Final report*. (NCEE Report 4043). Retrieved from Institute of Education Sciences website: http://ies.ed.gov/ncee/pubs/20094043/pdf/20094043.pdf

Dobbie, W. (2011). *Teacher characteristics and student achievement: Evidence from teach for america*. Unpublished Manuscript, Harvard University, Cambridge, Massachusetts.

Duckworth, A. L., Quinn, P. D., & Seligman, M. E. (2009). Positive predictors of teacher effectiveness. *The Journal of Positive Psychology, 4*, 540-547.

Education First, *Ensuring High Quality Teacher Talent* (2015) Retrieved from Education First website: http://education-first.com/wp-content/uploads/2016/01/Ensuring-High-Quality-Teacher-Talent.pdf

Gansle, K. A., Noell, G. H., & Burns, J. M. (2012). Do student achievement outcomes differ across teacher preparation programs? An analysis of teacher education in Louisiana. *Journal of Teacher Education, 63*, 304-317.

Goldhaber, D., Cowan, J., & Theobald, R.(2016) Evaluating Prospective Teachers: Testing the Predictive Validity of the edTPA. *CALDER Working Paper*.

Goldhaber, D., & Grout, C. (2016). Which plan to choose? The determinants of pension system choice for public school teachers. *Journal of Pension Economics and Finance, 15*, 30-54.

Goldhaber, D., Krieg, J. M., & Theobald, R. (2016). *Does the match matter? Exploring whether student teaching experiences affect teacher effectiveness and attrition* (National Center for Analysis of Longitudinal Data in Educational Research). Washington, DC: American Institutes of Research

Goldhaber, D., Liddle, S., & Theobald, R. (2013). The gateway to the profession: Assessing teacher preparation programs based on student achievement. *Economics of Education Review, 34*, 29-44.

Harris, D., & Sass, T. (2007). *Teacher training, teacher quality and student achievement* (National Center for Analysis of Longitudinal Data in Educational Research). Washington, DC: American Institutes of Research

Harris, D. N., & Sass, T. R. (2011). Teacher training, teacher quality and student achievement. *Journal of Public Economics, 95*, 798-812.

Harris, E. (2015), Tough tests for teachers, with question of bias. *New York Times,* pp. A1.

Henry, G. T., Bastian, K. C., Fortner, C. K., Kershaw, D. C., Purtell, K. M., Thompson, C. L., et al. (2014). Teacher preparation policies and their effects on student achievement. *Education, 9*, 264-303.

Henry, G. T., Purtell, K. M., Bastian, K. C., Fortner, C. K., Thompson, C. L., Campbell, S. L., et al. (2014). The effects of teacher entry portals on student achievement. *Journal of Teacher Education, 65*, 7-23.

Hill, H. C., Rowan, B., & Ball, D. L. (2005). Effects of teachers' mathematical knowledge for teaching on student achievement. *American Educational Research Journal, 42*, 371-406.

Ingersoll,R., Merrill,L., & May, H. (2012*).* Retaining teachers: How preparation matters. *Educational Leadership.*

Jacob, B., J. Rockoff, E. Taylor, B. Lindy, & R. Rosen (2016). Teacher Applicant Hiring and Teacher Performance: Evidence from DC Public Schools. NBER Working Paper 22054.

Kane, T. J., Rockoff, J. E., & Staiger, D. O. (2008). What does certification tell us about teacher effectiveness? Evidence from new york city. *Economics of Education Review, 27*, 615-631.

Koedel, C., Parsons, E., Podgursky, M., & Ehlert, M. (2015). Teacher preparation programs and teacher quality: Are there real differences across programs? *Education Finance and Policy, 4*, 508-534.

Lincove, J. A., Osborne, C., Dillon, A., & Mills, N. (2013). The politics and statistics of value-added modeling for accountability of teacher preparation programs. *Journal of Teacher Education,* doi: 0022487113504108.

Mihaly, K., McCaffrey, D. F., Staiger, D. O., & Lockwood, J. (2013). A composite estimator of effective teaching. *Seattle, WA: Bill & Melinda Gates Foundation*

Papay, J. P., & Kraft, M. A. (2015). Productivity returns to experience in the teacher labor market: Methodological challenges and new evidence on long-term career improvement. *Journal of Public Economics, 130,* 105-119.

Papay, J. P., West, M. R., Fullerton, J. B., & Kane, T. J. (2012). Does an urban teacher residency increase student achievement? Early evidence from Boston. *Educational Evaluation and Policy Analysis, 34*, 413-434.

Rockoff, J. E. (2004). The impact of individual teachers on student achievement: Evidence from panel data. *The American Economic Review, 94*, 247-252.

Rockoff, J. E., Jacob, B. A., Kane, T. J., & Staiger, D. O. (2011). Can you recognize an effective teacher when you recruit one? *Education, 6*, 43-74.

Rockoff, J. E., & Speroni, C. (2010). Subjective and objective evaluations of teacher effectiveness. *The American Economic Review, 100,* 261-266.

Ronfeldt, M. (2012). Where should student teachers learn to teach? Effects of field placement school characteristics on teacher retention and effectiveness. *Educational Evaluation and Policy Analysis, 34*, 3-26.

Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal, 52,* 475-514.

Ronfeldt, M., Reininger, M., & Kwok, A. (2013). Recruitment or preparation? Investigating the effects of teacher characteristics and student teaching. *Journal of Teacher Education,* doi: 0022487113488143.

Ronfeldt, M., Schwartz, N., & Jacob, B. (2013). Does pre-service preparation matter? Examining an old question in new ways. *Teachers College Record,* doi: 01614681

Sass, T. R., Semykina, A., & Harris, D. N. (2014). Value-added models and the measurement of teacher productivity. *Economics of Education Review, 38,* 9-23.

Sawchuk, S. (2011). Teacher residencies make strides, encounter obstacles. *Education Week, 30*(36), 12-13.

University of North Carolina. (2016). *UNC Educator Quality Dashboard*. Retrieved from: http://eqdashboard.northcarolina.edu/

United States Department of Education. (2016). *2015 Title II Reports*. Retrieved from: https://title2.ed.gov/Public/Home.aspx

Xu, Z., Hannaway, J., & Taylor, C. (2011). Making a difference? The effects of teach for america in high school. *Journal of Policy Analysis and Management, 30*, 447-469.

Appendix Table 1- Teacher Licensure Requirements By State[*]

State	General Information	Routes to Licensure	Percentage in Traditional/ Alternative Routes	Stages to Licensure	Assessments	Clinical Requirement
Alabama	• GPA: 2.5 • Criminal Background Check (CBC): Yes • Fee: $30	Traditional: • Class A • Class AA • Class B Alternative: • Alternative Class A • Alternative Baccalaureate Level	Traditional: 76% Alternative: 24%	• Class A • Class B	Basic Skills: • ACT WorkKeys • Applied Math, • Reading for Writing, • Writing Additional Assessments: • Principals of Leadership and Teaching (PLT) for grade band • Subject and grade specific Praxis	Handled at preparation program level
Arkansas	• GPA: None. • CBC: Yes • Fee: $75	Traditional: • University based teacher preparation Alternative: • Arkansas Professional Pathway to Educator Licensure • Non-Traditional MAT, MED, MTLL through Colleges and Universities • Teach For America (TFA) • Arkansas Teacher Corp • Provisional Professional Teaching License	Traditional: 74% Alternative: 26%	• Provisional • Standard	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Subject and grade band specific Praxis	Handled at preparation program level
Delaware	• GPA: None • CBC: No • Fee: $100	Traditional: • University based teacher preparation Alternative: • Delaware Transition to Teaching	Traditional: 94% Alternative: 6%	Emergency Certificate Standard Certificate • Initial	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Subject and grade band	• Student teaching in regionally accredited university prep program, • TFA: Institute + 200 hrs pre-service training • Residency (120 hrs of

[*] Information compiled from state agency websites and conversations with state departments of education by University of Virginia researchers, March 2016.

State	General Information	Routes to Licensure	Percentage in Traditional/ Alternative Routes	Stages to Licensure	Assessments	Clinical Requirement
		Partnership • TFA • Residency Programs		• Advanced	specific Praxis	preservice, + 1 full year of residency) • 1 year (91 days) of long-term subbing in high-needs fields
Florida	• GPA: 2.5 in content area • CBC: Yes • Fee: $75	Traditional: • University based teacher preparation Alternative Routes: • Educator Preparation Institutes • District Professional Development Certification Program • American Board for Certification of Teaching Excellence Certificate • College Teaching Experience • Professional Training Option • Professional Preparation through College Coursework	Traditional: 76% Alternative: 24%	• Temporary • Professional	Mastery of General Knowledge: • Passing score Florida General Knowledge Test • Teaching certificate issued by a US state or territory • A certificate issued by the National Board for Professional Teaching Standards or the American Board for Certification of Teacher Excellence • Two semesters of full-time college teaching experience or the equivalent in part-time college teaching experience • GRE Scores	Pathway specific
Georgia	• GPA: 2.5 or proof of acceptance into GA educator program • CBC: pre-service only • Fee: $20	Traditional: • Induction Pathways 1-4 Alternative Routes (all partner with school district): • Regional Education Service Agencies • County or School Districts • TFA • GA Charter Schools • Technical College System of GA	Traditional: 92% Alternative: 8%	• Pre-Service Induction • Professional • Advanced/ Lead	• GACE Basic Skills Tests in Reading, Writing and Mathematics. • GACE content area exam • edTPA performance assessment	560-600 clinical hours
Kentucky	• GPA: No, unless outside U.S.	Traditional: • University based teacher	Traditional: 86% Alternative: 14%	• Rank III • Rank II	Basic Skills: • Praxis 1 Core Academic Skills	Required letter of completion

State	General Information	Routes to Licensure	Percentage in Traditional/ Alternative Routes	Stages to Licensure	Assessments	Clinical Requirement
	• CBC: Yes • Fee: $50	preparation Alternative Routes: • Exceptional Work Experience Certification • District Training Certification • College Faculty Certification • Adjunct Instructor Certification • Veterans of the Armed forces • University-Based Alternative Route to Certification • Institute Alternative Route to Certification • TFA		• Rank I	Reading, Writing, Math Additional Assessments: • Subject and grade band specific Praxis	
Louisiana	• GPA: No • CBC: No (professional conduct form) • Fee: $50	Traditional: • University based teacher preparation Alternative Routes (9 total in three broad tracks): • Master's Degree • Certification Only Program • Practitioner Teacher Program	Traditional: 46% Alternative: 54%	• Level 1 • Level 2 • Level 3	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Principals of Leadership and Teaching (PLT) for grade band • Subject and grade band specific Praxis	Traditional: • 180 hrs plus semester student teaching Alternative Route: • Track dependent
Maryland	• GPA: 2.75 • CBC: No • Fee: Yes, amount unknown	Traditional: • University based teacher preparation Alternative Routes: • District Based Resident Teaching Certificate Programs • Baltimore City Teaching Residency partnership with The New Teacher	Traditional: 86% Alternative: 14%	• Professional Eligibility Certificate • Standard Professional Certificate 1 • Standard Professional Certificate 2	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Subject and grade band specific Praxis	Traditional: • 3 credit internship, grade of C or higher Alternative Route: • Track dependent

State	General Information	Routes to Licensure	Percentage in Traditional/ Alternative Routes	Stages to Licensure	Assessments	Clinical Requirement
		Project (TNTP) • Teach for America • Urban Teacher Center • Alternative Teacher Preparation Program in World Languages (Goucher College) • Montgomery County Alternative Certification for Effective Teachers • Maryland Science and Mathematics Resident Teacher • Prince George's County Resident Teacher Program		• Advanced Professional Certificate • Resident Teacher Certificate • Conditional Certificate		
Mississippi	• GPA: C or higher in preparation coursework, 2.75 on pre-major coursework • CBC: No, character checklist • Fee: None	Traditional: • One Year Teacher Intern License • Five Year Educator License Alternative Routes (not for prospective K-3 teachers): • Master of Arts in Teaching Alternate Route • Mississippi Alternate Path to Quality Teachers • Teach Mississippi Institute • American Board for the Certification of Teacher Excellence • 5 Year Alternative program	Traditional: 63% Alternative: 37%	• Class A = Bachelor's level • Class AA = Master's level • Class AAA = Specialist level • Class AAAA = Doctorate level l	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Subject and grade band specific Praxis	Handled at preparation program level
North Carolina	• GPA: No • CBC: yes • Fee: In State: $55, Out of State: $85	Traditional: • University based teacher preparation Alternative Routes: • College or university Master's program • Regional Alternative Licensing	Traditional: 80% Alternative: 20%	• Lateral Entry Provisional Professional Educators License (alternative route only) • Standard Professional	Basic Skills: • Pearson Test for North Carolina: Foundations of Reading and General Curriculum (Elementary and Exceptional Children only) Additional Assessments: • Subject and grade band	Handled at preparation program level

State	General Information	Routes to Licensure	Percentage in Traditional/ Alternative Routes	Stages to Licensure	Assessments	Clinical Requirement
		Center		1 • Standard Professional 2	specific Praxis	
Oklahoma	• GPA: 2.5 • CBC: yes • Fee: $50	Traditional: • University based teacher preparation Alternative Routes: • Master's degree at state approved program • American Board for Certification of Teacher Excellence • TFA • Paraprofessional to teacher program • Special Education Non-Traditional Alternative Placement Program • CareerTech Instructor Certification • Troops for Teachers • Four Year Olds and Younger Certificate • Oklahoma Title 1 Paraprofessional Teaching Credential • Emergency Certification: At the request of a school district administrator only. Must be approved by the State Board.	Traditional: 75% Alternative: 25%	5 Year Renewable Certificate	Basic Skills: • Oklahoma General Education Test Additional Assessments: • Oklahoma Subject Area Tests (OSAT) • Oklahoma Professional Teaching Exam (OPTE)	Handled at preparation program level
South Carolina	• GPA: None • CBC: Yes • Fee: $105	Traditional: • University based teacher preparation Alternative Routes: • Program of Alternative Certification for Educators	Traditional: 88% Alternative: 12%	• Bachelor's + 18 semester hours • Master's • Master's + 30 hrs • Doctorate	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Principals of Leadership and Teaching (PLT) for grade	Yes, details not available.

State	General Information	Routes to Licensure	Percentage in Traditional/ Alternative Routes	Stages to Licensure	Assessments	Clinical Requirement
		• Career and Technology Education • Teach for America • American Board for Certification of Teacher Excellence • Adjunct Certification			band • Subject and grade band specific Praxis	
Tennessee	• GPA: None • CBC: No • Fee: No (program pays fee)	Traditional: • University based teacher preparation Alternative Routes: • Organizations working in collaboration with at least one local education agency (LEA) with which the organization has established a primary partnership. • 6 approved: Memphis Teacher Residency, Teach for America Memphis, Teach for America Nashville, Teach Tennessee, TNTP Memphis, TNTP Nashville	Traditional: 81% Alternative: 19%	• Transitional • Apprentice • Practitioner • Professional	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Principals of Leadership and Teaching (PLT) for grade band • Subject and grade band specific Praxis	Handled at preparation program level
Texas	• GPA: None • CBC: Yes • Fee: Yes, amount unlisted	Traditional: • University based teacher preparation Alternative Routes: • Texas has approximately 60 approved alternative route preparation providers (some are run by universities and community colleges) • Regional and district-specific programs • Charter network programs • Online preparation program	Traditional: 59% Alternative: 41%	• Probationary • Standard	Basic Skills: • Pre-Admission Content Test (PACT) Additional Assessments: • TExES subject area test	Handled at preparation program level

State	General Information	Routes to Licensure	Percentage in Traditional/ Alternative Routes	Stages to Licensure	Assessments	Clinical Requirement
		• TNTP • TFA.				
Virginia	• GPA: None • CBC: No • Fee: $50 in state, $75 out of state	Traditional: • State- approved university based teacher preparation Alternative Routes: • 3 year non-renewable alternative license • Provisional Special Education • Career Switcher Program	Traditional: 93% Alternative: 7%	Initial Licensure: • Collegiate Professional • Postgraduate Professional • Provisional • Provisional Special Education License Licensure Add-on: • Career Teacher • Mentor Teacher • Teacher as Leader	Basic Skills: • Virginia Communication and Literacy Assessment Additional Assessments: • Reading assessment for Elementary and Special Education • Subject and grade band specific Praxis	Required, number of hours not listed.
West Virginia	• GPA: 2.5 • CBC: Yes and character reference • Fee: $35 in-state $100 out of state	Traditional: • University based teacher preparation Alternative Routes: • Unnamed; a candidate can take classes toward certification while teaching	Traditional: 98% Alternative: 2%	• Temporary Certificate • 5-Year Professional Certificate • Permanent Professional Teaching Certificate	Basic Skills: • Praxis 1 Core Academic Skills Reading, Writing, Math Additional Assessments: • Principals of Leadership and Teaching (PLT) for grade band • Subject and grade band specific Praxis	Traditional: • Minimum 125 hours, at least 85 hours in a public school. Alternative Route: • Completed "on the job" *Note: Requirements up for reauthorization July, 2016*