INTERIM REPORT: STRATEGIES TO ADDRESS EDUCATION WORKFORCE CHALLENGES

A Research Literature and Policy Review Brief

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Public Policy Associates is a public policy research, development, and evaluation firm headquartered in Lansing, Michigan. We serve clients in the public, private, and nonprofit sectors at the national, state, and local levels by conducting research, analysis, and evaluation that supports informed strategic decision-making.

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Executive Summary

With teacher staffing issues topping education policy agendas, states and local districts have responded with an array of strategies designed to both widen the pre-service teacher supply pipeline and to mitigate in-service teacher turnover. A review of the evidence suggests that: (1) money matters, especially in the short run; but so does (2) teacher preparation and school working conditions.

DIMENSIONS AND COMMONALITIES AMONG TEACHER-FOCUSED STRATEGIES

Policy strategies tend to fall along four key dimensions (Report Appendix A):

- Expanding the pre-service teacher supply pipeline vs. increasing in-service teacher recruitment and retention
- Direct financial incentives vs. non-financial regulatory action or programming
- Short-term vs. long-term implementation toward the intended impact
- More centralized state-run strategies vs. more decentralized district-led strategies

Effective strategies have been targeted to high-need positions by content or subject area, community locale, school characteristic, and/or teacher candidate. These policies tend to be better implemented with funding sufficiency, stability, and sustainability; program promotion with minimal administrative burden; alignment and coordination of state and local roles and supports; and multi-level labor market and program data (Report Appendix B).

STRATEGIES TO EXPAND THE PRE-SERVICE PIPELINE

This type of strategy targets potential and pre-service teacher candidates by incentivizing pipeline access, persistence, and completion, while reducing barriers to entry into the profession. Most often the state looks to affect teacher-preparation pathways and related teaching-certification requirements to increase the overall pool of teachers.

DIRECT FINANCIAL STRATEGIES

Direct financial strategies for pipeline expansion seek to decrease the costs of teacher preparation and certification:

- Defraying preparation program costs through student-loan forgiveness, grant, or repayment as a scholarship or grant, subsidy, or stipend
- Reducing incidental preparation/certification expenses (e.g., testing, licensing, and other administrative fees)
- Mitigating the financial-opportunity costs associated with traditional preparation programs by, for example, giving stipends or grants for student teaching or other otherwise uncompensated, required education work
- Waiving or revising state laws that risk pension benefits if a retired teacher re-enters teaching
- Paying teacher candidates in Grow Your Own (GYO), residency, and similar programs for work performed during the clinical-training component and/or to cover program tuition and expenses

Specific program results have varied, but targeted payments seem effective when large enough relative to educational cost.

PROGRAM AND REGULATORY STRATEGIES

Program and regulatory strategies emphasize the reduction in the time and expense required to become a teacher. One common expedient is to loosen or eliminate licensing requirements, often by issuing emergency or similar certificates. A lesser used approach is to establish a multi-tier certification system with a range of entry points. Another strategy reduces conditions on inter-state reciprocity for eligible teachers.

A large group of program strategies consists of teaching career pathways developed apart from traditional four-year university preparation programs. An array of providers has implemented preparation models to help teacher candidates attain credentials in less time and at lower cost. Alternatively certified teachers make up a relatively small percentage of the teacher workforce in most states, and they experience high turnover rates overall. Research does not show how successfully such alternative programs recruit for hard-to-staff schools.

Longer-term program strategies typically work through partnerships between districts and teacher training programs, often with state (and sometimes local) support, that provide contextualized, structured teacher pathways. Program models include:

- Teacher residencies, an apprenticeship model where teacher candidates complete an alternative teacher-preparation program while engaging in supervised clinical training in a school-based placement.
- Adult GYO programs seeking to address school-level educator staffing challenges while diversifying staff and providing a pathway for local-community teacher candidates.
- Other GYO programs that expose secondary-level students to teaching as an attractive career and sometimes help them onto a teacher pathway, usually through a traditional preparation program.

Despite anecdotal support, there is a dearth of rigorous research on GYO and residency programs. Limited research on certain sub-sets of GYO programs indicates potential improvements in recruitment and retention. However, the evidence suggests several recurring issues around scalability, sustainability, and cost-effectiveness.

STRATEGIES TO IMPROVE IN-SERVICE RECRUITMENT AND RETENTION

Teacher turnover, especially among early career teachers, contributes to staffing challenges. Three factors that influence recruitment and retention are compensation; professional preparation, induction, and early support; and working conditions.

DIRECT FINANCIAL STRATEGIES

Direct financial strategies to improve district- or school-level recruitment and retention include:

- Directly paying prospective teacher-employees in the form of student teacher stipends; employment signing bonuses; loan forgiveness, grant, or repayment; or relocation expense reimbursements.
- Granting years-of-experience credit on district salary schedules or assisting with housing or other living expenses.
- Increasing regular compensation for teachers through across-the-board salary increases or retention bonuses, or targeted salary increases, stipends, or retention bonuses.
- Awarding compensation to teachers who upgrade their certificates/endorsements and who teach in targeted schools or content areas.
- Paying teachers more for increased instructional time or duties including those on a career ladder or taking on additional roles.

Targeted financial incentives have the potential to reduce teacher turnover if designed and implemented consistently. The impact of payments varies with amount and duration; further, direct payments may be more effective than indirect payments. However, monetary incentives appear to work only as long as they continue, and incentives seem most effective in getting teachers into hard-to-staff schools but are much less effective at keeping them there.

PROGRAM AND REGULATORY STRATEGIES

Program and regulatory strategies include:

- Induction programs support strategies such as mentoring, reduced teaching loads, and focused professional development. Some evidence suggests that quality induction and mentoring programs can enhance novice teacher retention. However, since quality in implementation is problematic, induction program effectiveness is currently an open question, most notably with respect to high-need areas.

- Fostering a positive school culture and climate that is conducive to teacher professionalism and efficacy. Working conditions tending to aid retention range widely from sufficient material resources and professional development to a collegial environment with administrative support. More specific strategies include hiring additional support staff, reducing class sizes, and expanding time for teacher collaboration and for high-quality professional development. Relatedly, districts have developed career-advancement opportunities, some in the form of structured career ladders, which may increase job satisfaction and reduce turnover.

POLICY AND PRACTICE CONSIDERATIONS

- Proactively develop a coherent system of teacher workforce development policies and practices.
- Establish and coordinate institutional roles and responsibilities for addressing teacher staffing challenges.
- Align the structure and implementation of alternative policy tools to maximize overall impact while minimizing costly trade-offs.
- Increase and improve the data collected on the teacher labor market and for policy evaluation.

Introduction

The labor market supporting K-12 schools has been a principal focus of policymaking and research for decades. Beginning with the effort to build up a public school system in the 19th century, through increased professionalism and unionization in the 20th century, and more recent attention on teacher effectiveness, an adequate supply of capable educators has been viewed as an essential precondition to high-quality schools. Periodic concerns about a crisis in education staffing have led to bouts of experimentation and reform in how teachers are prepared, recruited, and retained.

We are living through another of those periods. The labor market disruptions accompanying the COVID-19 pandemic and its aftermath are still reverberating through the United States economy, and in response, school districts, state administrators, and legislators are trying to find the best ways to ensure that every student has access to capable teachers. In service of this goal, this report summarizes some of the principal strategies that have been attempted to increase the supply and retention of educators, as well as identifying some of the evidence (or lack thereof) on the impact of those strategies. We present a typology of different strategies, which is just a way to organize the most important approaches by their most salient characteristics. We hope that the findings of this review will help inform public discussions as we consider how best to strengthen K-12 education staffing in Michigan.

There are several caveats that should be kept in mind while reading this report. First, our review is by no means exhaustive. One could draft entire books explaining and evaluating each of the major strategies for improving the supply of teachers, and detailing variations in how these policies have been implemented across states and districts. The report should therefore be viewed as an introduction, one that helps frame the debate and that leads to more detailed elaboration and analysis. Second, we do not take sides in the ongoing debate about the severity of teaching staffing challenges—our aim here is to describe the strategies used to ameliorate perceived shortages. Third, we concentrate our attention on questions of teacher quantity (whether there are enough teachers) without delving into the vital question of teacher quality (how effective teachers are). Fourth, the report does not directly focus on efforts to address teacher diversity or how diversification of the teacher workforce is related to teacher quantity.

Finally, this report focuses only on the supply of *teachers*, rather than the entire K-12 education labor market. It does not consider policies related to other education staff that play a critical role in school functioning: district administrators, principals, substitutes, and other instructional and non-instructional support staff. This is partly in the interests of space, and because teacher supply has received far more attention than other education staff. However, this report is one part of a larger effort to study the K-12 labor market as a whole. In the near future we will release additional reports that present evidence on how teachers, substitutes, principals, superintendents, and other stakeholders view the state of Michigan education staffing, its effects on students, efforts to diversify the profession, and where we should go from here.

THE TEACHING WORKFORCE

The lingering effects of the COVID-19 pandemic have been associated with a widespread perception of a crisis in education workforce staffing, especially concerning teachers (e.g., Lieberman, 2021). Yet even before the pandemic, reported staffing challenges had persisted for years, particularly in hard-to-staff content areas such as special education, math, science, and among English language learners (e.g., Dee and Goldhaber, 2017; Jacobs, 2021; see U.S. Department of Education, 2017).

Other long-standing challenges involve dedicated efforts to diversify the education workforce and to staff certain kinds of schools, such as those that perform poorly on standardized tests, those located in rural and urban areas, and those schools that serve communities of color or economically disadvantaged families (e.g., Garcia and Weiss, 2019; Sutcher et al., 2016).

The pandemic seems to have heightened the salience of these long-term trends by affecting the functioning of school personnel labor markets in the short-term, exacerbating pre-existing concerns about staffing, and creating uncertainties for districts and schools in Michigan and across the United States

(e.g., Carver-Thomas, 2022; Carver-Thomas et al., 2022). The extent to which perceptions around particular staffing issues are accurate and proportionate in scope and scale to conditions across districts remains an open question.

Teacher labor markets are localized, varying widely within and across states, but tending to concentrate staffing problems in particular communities and around subject matter or content areas (McDole and Francies, 2022; Aragon, 2018). Nevertheless, with teacher staffing problems topping education policy agendas, states and local districts have responded with an array of strategies, both to widen the pre-service teacher supply pipeline and to mitigate in-service teacher turnover and churn.[1] Some strategies have been built on pre-pandemic policies; while others largely recapitulate past attempts to address perceived shortages with some relatively innovative, or at least novel, strategies being promoted in certain jurisdictions.[2]

Predictably, identifying and addressing the multiple causes of school staffing challenges has always been complex, and policy responses often run ahead of research to gauge successes (e.g., Garcia and Weiss, 2020; Kini, 2022; Kolbe and Strunk, 2012). Strategies to address staffing challenges vary widely in extent of their research or evidence base. Despite this, some strategies are too recent in design, adoption, or implementation to have a compelling evidence base. Studies of other strategies have resulted in unclear or mixed results depending on methodology and context, and still others are understudied.

But even where researchers have seen evidence of successful strategies, the empirical results often depend on specific policy terms and robust long-term funding, as well as unique local contexts and implementation fidelity (see Hume, 2022; Papay et al., 2017). There is much, in short, that we simply do not know.

This literature review brief, therefore, is not an exhaustive scan of state policies or research literature. Rather, as an interim report as part of a statewide school staffing research study authorized and funded by Section 27f of the most recent School Aid Act, 2022 Public Act No. 144 (July 14, 2022), it is a review of the general approaches that states have taken and an introduction to the relevant evidentiary base or lack thereof. To this end, below we propose a new typology to organize strategies that may be considered to address teacher staffing challenges in Michigan (see Appendices A and B).

The larger, overarching study (as fully described in 27f) will tackle challenges around the broader education workforce. While this brief focuses on teacher staffing issues consistent with the bulk of the literature, other data to be collected and analyzed will be needed to inform the wider issues, which will be the subject of future reporting. Where there is truly little literature, as with other school personnel, professional or otherwise, it is somewhat unclear at this point (before this study progresses) the extent to which lessons from the literature on teachers can or should be extended to other classifications.

The predominant conclusion of this analysis of the extant body of research is that: (1) money matters, especially in the short run, but also (2) so does teacher preparation and school working conditions (Hanover Research, 2014; Hulme, 2022; McDole and Francies, 2022; Podolsky et al., 2019; See, Morris et al., 2020; See, Gorard et al., 2020).

[1] As recently reported in *Crain's Detroit Business,* the Detroit Public Schools Community District is successfully addressing its teacher staffing challenges through an intentional combination of strategies (Gallagher, 2022).

[2] The current political salience of school staffing issues has even prompted a presidential response (Executive Office of the President, 2022), and successive rounds of federal pandemic relief dollars can and have been used to support state and district initiatives in this policy area (see, e.g., Jordan and DiMarco, 2022; Kini, 2022).

A Typology of Teacher-Focused Strategies

Based on our review of existing state and district strategies to strengthen the teacher labor market, the main approaches tend to fall along the following key dimensions:

- Expanding the pre-service teacher supply pipeline vs. increasing in-service teacher recruitment and retention
- Direct financial incentives vs. non-financial regulatory action or programming
- Short vs. long term implementation toward the intended impact
- More centralized state-run vs. more decentralized district-led designs, funding, adoption, and implementation

Our typology is presented in Appendix A of this report. Appendix A provides a more specific categorization of strategies within and across dimensions. Along each dimension, strategies are organized by their primary purpose and policy lever, although a strategy may in practice span categories, depending on the specifics of design and implementation.[3]

STRATEGIES TO EXPAND THE PRE-SERVICE PIPELINE

These strategies typically treat teacher workforce challenges as a problem of inadequate supply. Their adoption is often prompted by such teacher pipeline characteristics as declining enrollment in teacher preparation programs, the low economic returns to a teaching career, and the costs in time, resources, and foregone income (Aldeman, 2022; Sutcher, et al., 2016; TNTP, 2022).

Strategies tend to target potential and pre-service teacher candidates, aiming to directly incentivize pipeline entry as barriers are reduced. They focus especially on teacher preparation pathways and programs, together with related teaching certification or licensure requirements (Carver-Thomas, 2018; Pennington McVey and Trinidad, 2019). A large majority are enacted at the state level since the goal lies in increasing the overall pool of available teachers, and because the state has the necessary resources and regulatory authority.

DIRECT FINANCIAL STRATEGIES

This approach seeks to enlarge the pool of teacher candidates by reducing the monetary cost of becoming a teacher. These strategies fall into sub-groups, the first of which lowers teacher preparation costs by direct payment to the student or on their behalf. State law varies in the precise amount, timing, and mechanism of payment, which may be characterized as educational/training loan forgiveness, grant or repayment, or as a scholarship, grant, subsidy, or stipend (Evans et al., 2019; Podolsky, et al., 2016).[4] These strategies also aim to address one of the barriers to a diverse teacher workforce, for example, because the disproportionate burden of student loans falls on Black students (McDole and Francies, 2022).

Each state likewise determines how to target or condition payments. Payments may be directed toward students who belong to underrepresented groups in the teacher workforce or toward students in designated preparation programs for high-demand fields like special education, ELL, or STEM (Pennington McVey and Trinidad, 2019). Payments may also be conditioned on recipient performance in their preparatory program or on teaching in a certain type of school or locale (Evans et al., 2019). The

[3] A recent article appearing in *Crains Detroit Business,* for example, suggested five categories of teacher retention strategies, each including examples for district (and state) consideration (Crain's Detroit Business, 2022).

[4] Apart from any applicable student loan forgiveness program, the federal government sponsors two targeted financial assistance programs for teachers: the Teacher Loan Forgiveness Program and the Teacher Education Assistance for College and Higher Education (Garcia and Weiss, 2020; Pennington McVey and Trinidad, 2019).

flexibility in these strategies means that they may also be directed to recruitment and retention challenges on a statewide basis (e.g., Feng and Sass, 2018).

As of 2019, forty-four states have a statute or regulation providing for "at least one statewide scholarship/grant, loan forgiveness and/or additional pay program" to incentivize teachers to work "in underserved schools and/or shortage subject areas" (Evans et al., 2019). There are statewide financial incentive programs for teachers of color in eleven states (Evans et al., 2019; see also Aragon, 2018; Carver-Thomas, 2018). States that have had their programs separately reviewed and held up as an example by researchers include Maryland (McDole and Francies, 2022), Arkansas (Pennington McVey and Trinidad, 2019; TNTP, 2021), Oklahoma (Pennington McVey and Trinidad, 2019), and North Carolina (Darling-Hammond et al., 2019).[5]

Although individual program results vary, the research indicates that such payments may be effective if a) they target on high-need positions, and b) the amount covers a significant portion of a candidate's educational expenses (Garcia and Weiss, 2020; Pennington McVey and Trinidad, 2019; Podolsky et al., 2019; TNTP, 2021). More successful programs tend to be well-publicized and "pitched" to strong, academically well-prepared students. Other connections with success include reasonable financial consequences for a failure of commitment, and a low administrative burden for participants (Pennington McVey and Trinidad, 2019; Podolsky et al., 2019; TNTP, 2021).

Other financial strategies are also intended to reduce preparation costs using lower cost mechanisms. For example, recently a range of states like Connecticut, Florida, Indiana, Massachusetts, New Jersey, and Oregon have cut, waived, or reimbursed teacher candidates for the expenses associated with mandated competency or licensing tests or other administrative fees (Putnam, 2022). At least a dozen other states have provided alternatives to or eliminated the educator testing requirement altogether (Francies, 2021; Snyder, 2022; Swisher, 2022).

A final set of strategies attempts to mitigate the financial opportunity costs associated with teacher preparation or training. Many teacher preparation programs require a period of student teaching that amounts to uncompensated pre-service work. In response, an increasing number of states have begun paying stipends or grants to student teachers (Erwin, 2022). The payments may be used to incentivize student teachers generally (e.g., Oklahoma, Will, 2022a), in high-needs fields (e.g., Indiana, Erwin 2022), or in rural schools (e.g., Colorado, Toch, 2022) and teacher candidates usually must agree to teach in the state for a period of time after program completion (Erwin, 2022; Will, 2022a).[6]

A longer-term approach lies in Grow Your Own (GYO), residency, and other alternative teacher pathway programs (discussed in the next section) that either compensate student-teacher candidates for working in schools during their preparation program and/or cover program tuition and expenses (see Garcia, 2020; Muñiz, 2020). As discussed below, these programs typically constitute partnerships with teacher training programs and operate with state authorization and support (Garcia, 2020; Muñiz, 2020; see also TNTP 2020; Zuschlag et al., 2021a). For example, this strategy has been executed in Michigan by the Muskegon Heights Public School Academy System (Middle Cities Education Association, 2020).[7]

Similar GYO and residency partnerships have been formed and implemented with state support, including competitive grants. Tennessee's approach has been promoted as an effective model (Kini, 2022; Will,

[5] It was recently announced that Michigan will begin taking applications for $10,000 higher education scholarships for future educators (Governor's Office, State of Michigan, 2022).

[6] Michigan recently joined such states with the announcement of a student teacher stipend program (Office of Governor, State of Michigan, 2022). Michigan Department of Education (2022). "Michigan To Start Apprenticeships to Develop Highly Skilled Educators." Press Release (November 14, 2022), accessed November 16, 2022, https://www.michigan.gov/mde/news-and-information/press-releases/2022/11/14/michigan-to-start-apprenticeships-to-develop-highly-skilled-educators

[7] Recently, the Michigan Department of Education with agency and IHE partners announced the establishment of a registered apprenticeship program for teacher preparation using a funded residency model (Michigan Department of Education, 2022).

2022a), and states like California, Minnesota, New York, Texas, and Washington have all implemented models of their own (see Muñiz, 2020).

A final opportunity cost approach concerns the laws in many states that make it difficult for retired teachers to re-enter teaching (often even as a substitute teacher) without jeopardizing their pension benefits. In the current post-pandemic environment, however, more than six states in addition to Michigan have temporarily suspended or waived such penalties (Will, 2022b).[8]

PROGRAM AND REGULATORY STRATEGIES

States and districts have also focused on reducing the time and expense for teacher candidates to achieve eligibility for recruitment and hire. One group of strategies depends on shorter-term state action—namely, the lowering of preparation and certification standards—that may increase the supply of teachers in a given area but also diminish in-service teacher quality and retention (Carver-Thomas, 2022; Peske, 2022; Putnam and Peske, 2022). Longer-term strategies, in contrast, depend in large measure on partners developing contextualized, accelerated pathway programs. These strategies are designed to enhance teacher preparation for recruited populations while also expanding and diversifying the teacher workforce (e.g., Carver-Thomas, 2018; Podolsky, et al., 2016).

States have long modified teacher qualification standards so that candidates lacking traditional teacher training and credentials could get into the classroom. In 2021 alone, twenty-seven states passed sixty-two bills concerning teacher certification and licensing (Francies, 2021). One common approach is lowering or eliminating licensing requirements, often by issuing modified, temporary, or emergency certificates or permits (Pennington McVey and Trinidad, 2019; see, e.g., Will, 2022b, reporting the issuance of about 3,600 emergency certificates in Oklahoma between June and mid-October 2022).

Revised standards may, for example, dispense with the usual BA degree requirement for teachers: four states authorize non-certified teachers, and twelve other states have modified or eliminated teacher candidate performance examination (Will, 2022b; Peske, 2022).

Extant research suggests that whatever the short-run effects, reduced standards may result in lower teacher quality, higher teacher turnover, and higher costs (Pennington McVey and Trinidad, 2019; Putnam and Peske, 2022; Will, 2022b). Though mixed, there is evidence that teaching without a regular certificate may adversely affect some students' performance; worse, emergency or similar certification may contribute to the inequitable assignment of teachers (Pennington McVey and Trinidad, 2019).

Not all changes in licensure requirements necessarily lower teacher qualifications. For example, Minnesota has reformed its multi-tier certification system so that teacher candidates may enter at different levels with different requirements, with limitations depending on credentials and experience (Pennington McVey and Trinidad, 2019). While only eight states currently offer complete inter-state reciprocity to all eligible, fully licensed teachers (Evans et al., 2020), over thirty-five others (Evans et al., 2020) could consider reforming their requirements (Pennington McVey and Trinidad, 2019). Pennsylvania has done so through legislation just passed this last summer (Graham, 2022).

A larger, second set of program strategies consists of teaching career pathways developed apart from traditional four-year university preparation programs (Redding and Smith, 2016). While these alternative certification programs require state authorization, they comprise an array of models at the local, state, and national levels, with programs delivered, and teaching certificates recommended by institutions of higher education (IHEs) and other, non-IHE providers (Redding and Smith, 2016). They attempt to

[8] There is a suggestion in the literature that full educator pension funding and benefit access and/or inter-state pension portability would help fill the pipeline by making a teaching career more financially attractive (Garcia and Weiss, 2020; Podolsky et al., 2019). There is scant evidence that states, districts, or prospective teacher candidates view such measures as strategies to address current staffing challenges. If anything, a discernible effect on teacher supply would be exceptionally long, much like general calls for increasing teacher salaries or status that beg the question of policy means to achieve such desirable ends.

provide adequate preparation for cohorts of more diverse teacher candidates through innovative training models resulting in credential attainment in less time and at lower cost.

Although alternative certification programs have operated for decades, it appears that, while still growing in use, and with a few high-profile exceptions (e.g., Texas, Louisiana), alternatively certificated teachers make up a relatively small percentage of the teacher workforce in most states (Evans et al., 2019).[9] Further, it is not clear the extent to which alternative certification programs effectively recruit teachers for hard-to-staff schools (See, Morris et al., 2020).

To be sure, teacher candidates of color are more likely to join the profession through alternative certification programs (Carver-Thomas, 2018). On the other hand, teachers from those programs are disproportionately represented in hard-to-staff schools, and teachers with alternative certifications overall experience high turnover rates (Carver-Thomas and Darling-Hammond, 2017; McDole and Francies, 2022; Pennington McVey and Trinidad, 2019). One study that compared the year-to-year turnover rates of early career alternatively certified to traditionally certified teachers found that, even controlling for other predictors of higher turnover, alternatively certified teachers were significantly more likely to leave teaching (Redding and Smith, 2016).

Two more structured alternative pathway models involve partnerships between local districts and teacher preparation programs, and they may include community-based or other service groups and/or funders. Both are frequently targeted to candidate populations and school or locale types.

The first is teacher residencies, an apprenticeship model, where teacher candidates complete an alternative teacher preparation program as they gain supervised clinical training in teaching in a school placement. (Pennington McVey and Trinidad, 2019; Podolsky et al., 2016).

Teacher residency programs are authorized by statute or regulation in thirteen states, with variation in funding, preparation program partners, and relationship to other programs (Evans et al., 2019). Studies of more established residency programs, such as those in Boston and San Francisco (Podolsky et al., 2016), have shown positive effects on the diversity and retention of teacher graduates (Pennington McVey and Trinidad, 2019; Podolsky et al., 2019). It appears that in the current context more states are considering the expansion of the residency model (Kini, 2022).

A second, closely related alternative pathway based on local partnerships are “Grow Your Own” (GYO) programs.[10] Like residency programs, GYO models seek to address school-level educator staffing challenges while diversifying staffs and providing a pathway for teacher candidates to achieve the preparation, certification, and experience necessary for a successful teaching career. One study found that 47 states have at least one GYO program, though they differed widely in design and implementation (Garcia, 2020). Nonetheless, variations on the GYO model share a focus on “preparing teachers from the community for the community” (Garcia, 2020, p. 6), and they often include community-based program and participant supports (Garcia, 2020; see Zuschlag et al., 2021a, 2021b).

One type of GYO program recruits participants from the ranks of education support professionals (e.g., paraprofessionals or classroom assistants, and sometimes bus drivers or custodians), as well as other adult school employees or community members (Garcia, 2020; Gist et al., 2019; Valenzuela, 2017). Successful GYO programs often concentrate on paraprofessionals, such as those in Washington State, California, Minnesota, and Arkansas (Garcia, 2020; Pennington McVey and Trinidad, 2019; see also Sindelar, 2012). Michigan has been promoting GYO programs for three years. As a result, Michigan has

[9] Using data reported to the federal government in 2016-2017, 2% of graduates from teacher preparation programs in Michigan came from alternative preparation programs, of which only 0.4% came from non-IHE based programs (Evans et al., 2019).

[10] The principal features that distinguish residency from GYO programs in practice appear to be on whom recruitment focuses and where in the teacher career pathway participants may enter. The program in Muskegon Heights, Michigan, which was referred to in the prior section, illustrates the potential for overlap (see Middle Cities Education Association, 2020).

created curricula associated with GYO programs for grades 6-12. To sustain these efforts, the Michigan Department of Education has distributed competitive grants for GYO programs and has secured $175 million in funding associated with support staff to teacher GYO programs.

Although the local pool of candidates may be smaller, paraprofessionals are often “passionate and eager candidates who are committed to working with children, have already spent significant amounts of time in classrooms, [and] have often developed considerable amounts of expertise in teaching and learning” (Delgado et al., 2021). Nearly half the states (23) have passed laws or regulations that offer paraprofessionals a pathway, program, or incentive to enter the teaching profession (Evans et al., 2019).

Another GYO model exposes secondary-level students to teaching as an attractive career, sometimes helping them onto a teacher pathway or into the pipeline, so that they will then pursue teaching after high school, usually through a traditional preparation program. Statutes and regulations in 22 states provide a pathway, program, or incentive to move high school students into a teaching career (Evans et al., 2019).

The student-based GYO programs may include CTE in local districts, college dual enrollment opportunities, and/or secondary school-sponsored field experiences and activities in the field (Garcia, 2020). Washington State has a robust set of these programs, which it supports with grants and other assistance (Adams and Manuel, 2016; Professional Educators Standards Board, n.d.). There are also national networks that provide structured content and support (Garcia, 2020; Podolsky et al., 2016; see, e.g., McNeil, 2016).

Despite anecdotal support (e.g., Skinner et al., 2011), there is a dearth of rigorous research on program operations, outcomes, and longer-term impacts (Garcia, 2020, Gist et al., 2019; Valenzuela, 2017). Empirical evidence does suggest several recurring challenges, chiefly that GYO programs seem difficult to sustain or scale up (e.g., Kaufman et al., 2020).

STRATEGIES TO IMPROVE IN-SERVICE RECRUITMENT AND RETENTION

Teacher turnover may contribute at least as much to staffing challenges as preparation pipeline flow (Carver-Thomas, 2017; Hulme, 2022; Ingersoll, 2001). The attrition of in-service teachers, and the resulting need to recruit, hire, and retain replacements, is a demand side challenge at the local level (e.g., Darling-Hammond et al., 2018). It is a fact especially evident with new and early career teachers (Aldeman, 2022; Ingersoll et al., 2014; Nguyen and Springer, 2021; Podolsky et al., 2016).

Despite a similarity in the overarching problem, policy tools, and theories of action, the goal of in-service recruitment and retention strategies differs significantly from pre-service pipeline expansion strategies. Because the latter strategies seek the expansion of the available teacher supply pool, the state usually takes a predominant role in strategy design, adoption, and implementation. In contrast, local demand-oriented strategies lie within the direct concern and policy domain of individual district-employers, although the state can play an important supporting or facilitating role.

In what follows, we focus on strategies designed to achieve effective recruitment and lasting retention at the district level. It should be noted that elements of pre-service preparation are associated with in-service teacher retention (Ingersoll et al., 2014; see Carver-Thomas and Darling-Hammond, 2017), but only weakly at best with in-service performance (James and Wyckoff, 2020, Burroughs et al. 2019).

In any event, research has converged upon three primary, proximate determinants of the sustained ability to recruit and retain teachers: (1) compensation; (2) professional preparation, induction, and early support; and (3) working conditions, including district/school organizational and management/leadership characteristics (Carver-Thomas and Darling-Hammond, 2017; Darling-Hammond et al., 2019; Podolsky et al., 2016; Podolsky et al., 2019).

DIRECT FINANCIAL STRATEGIES

The strategies in this category offer various forms of compensation, both to induce candidates to accept an offered position in the first place and to increase the financial value of staying in the district, thereby reducing teacher attrition.

Directly paying prospective teacher-employees is one way to get them in the door. These may take the form of student teacher stipends; employment signing bonuses; loan forgiveness, grant, or repayment; or relocation expense reimbursements (Podolsky et al., 2016). Such payments are usually non-recurring, although the total may be paid over time. They also are often targeted to high-demand subjects or school characteristics, with the teacher obligated to work in the agreed assignment for a minimum period (Aldeman and Silberstein, 2021).

Massachusetts and Minnesota have offered signing bonuses for certain teachers (McDole and Francies, 2022). Wake County Public Schools in North Carolina started signing bonuses in 2021 for special education teachers (Toch, 2022). A district may also entice teacher-recruits by granting years of experience credit on the salary schedule or by giving in-kind or subsidized assistance with housing,[11] transportation, meals, or access to local amenities such as health club memberships (Podulsky et al., 2019).[12]

More common are monetary incentives to increase regular compensation for novice and veteran teachers. These can include across-the-board salary increases on-schedule, whether in percentage or "flat dollar" terms,[13] and across-the-board retention bonuses (Aldeman, 2022; Garcia and Weiss, 2020; Kolbe and Strunk, 2012; AFT Teacher and School Staff Shortage Task Force, 2022; Podolsky et al., 2019).[14] States with districts recently using these strategies include Colorado, Georgia, Indiana, Mississippi, Tennessee, Texas, and Virginia. (Aldeman and Silberstein, 2021; Will, 2022a).

It is more common that enhanced compensation is targeted – for example, by using an alternative salary schedule, where pay level depends in part on subject area or by targeted pay increases, stipends, or retention bonuses for working in hard-to-staff schools (Garcia and Weiss, 2020; Kolbe and Strunk, 2012; Podolsky et al., 2019; Saenz-Armstrong, 2022). Statutes or regulations in twenty-nine states mandate or directly promote enhanced pay for teaching in underserved schools or designated subject areas (Evans et al., 2019).[15]

But in the contemporary staffing challenge context, "what has changed is the size of the amounts and the speed in which districts have rolled out their new targeted pay plans" (Aldeman and Silbertein, 2021, p. 5). In 2020 for instance, Hawaii began paying $10,000 more to its special education teachers (Toch,

[11] As California's statewide teacher housing assistance policy shows, housing costs may be a significant factor in recruitment (Erwin, 2022; see also Toch, 2022 concerning recent developments in the teacher housing efforts of the Austin Independent School District in Texas).

[12] These latter ancillary benefits, if widely available, may become accepted as "perks" of employment, which may contribute to staff retention.

[13] Sixteen states maintain a statewide salary schedule, and eight more states set a minimum teacher salary (Evans et al., 2019). Thus, in about half the states an across-the-board salary increase strategy requires at least in part state action.

[14] Unlike percentage pay increases, "flat dollar" payments, especially of bonuses and stipends, typically do not increase districts' obligations on the salary schedule or scale (Aldeman and Silberstein, 2021). Research has found that districts tend to pay incentives in addition to salary schedule compensation, rather than altering the schedule itself (Kolbe and Strunk, 2012).

[15] In addition to helping districts fund pay increases, stipends, and bonuses, states can indirectly contribute to enhanced compensation for some teachers through tax waivers, deductions, and credits (Kolbe and Strunk, 2012; see, e.g., Erwin, 2022 on Georgia's recent legislation that grants tax credits to teachers agreeing to work in rural or underperforming schools and on the Iowa tax deduction for educational materials and professional development expenses).

2022).[16] The literature contains evidence that targeted pay increases can reduce teacher turnover (Pennington McVey and Trinidad, 2019); however, positive effects are contingent on payment amounts and duration (Podolsky et al., 2019; See, Morris et al., 2020).

Other strategies award teachers additional compensation for improving their credentials. Ten states provide teachers the incentive to upgrade their certificates or endorsements to teach in underserved schools or high-demand content areas (Evans et al., 2019; Podolsky et al., 2019).[17] Thirty-two states provide teachers who earn National Board Certification (NBC) with the opportunity for additional pay (Evans et al., 2019). The increased compensation may be paid as a one-time or recurring bonus, salary supplement, or stipend, and the initial or further payment is sometimes tied to teaching assignment in an under-performing or hard-to-staff school (Evans, et al., 2019).[18]

Evidence suggests that NBC teachers may show improved performance, and they are less prone to attrition (McDole and Francies, 2022). California was an early leader in experimentation with conditional NBC bonuses (Podolsky et al., 2019), and Arkansas currently provides a rising scale of annual bonuses for NBC teachers, depending on their school assignment (McDole and Francies, 2022).

Finally, some districts pay teachers more for additional work duties and responsibilities as a teacher (as opposed to as a coach, student group advisor, etc.). Sometimes using pandemic relief monies, districts may pay teachers for providing additional learning time through tutoring, summer school, or an extended school schedule (Aldeman and Siberstein, 2021). Teachers who ascend a career ladder or otherwise assume additional professional or leadership roles (discussed below) may in some systems see a substantial increase in pay (e.g., Toch, 2022).

The research indicates that direct financial strategies, which are most often targeted for high-demand subjects and hard-to-staff schools, may be effective for recruitment and retention if properly designed and implemented (Garcia and Weiss, 2020; Hanover Research, 2014; Kolbe and Strunk, 2012; Pennington McVey and Trinidad, 2019; see, Morris et al., 2020). One recent study examined the Florida Critical Teacher Shortage Program, which provided targeted loan forgiveness and bonuses, over its more than two-decade existence (Feng and Sass, 2018).The researchers found that although both types of payments decreased teacher attrition in the targeted areas, direct cash payment was the more effective strategy. They further determined that the impact of the loan forgiveness intervention varied directly with payment amounts (Feng and Sass, 2018; see also Pennington McVey and Trinidad, 2019).

An extensive review and ranking of research by strength of causal inference found that financial incentives with certain conditions were a promising approach to staffing challenges in hard-to-staff schools (See, Morris et al., 2020; see also Nguyen and Springer, 2021). Its authors stressed, however, two significant limitations of such strategies: (1) incentives work as long as they continue; and (2) incentives seem most effective in getting teachers into hard-to-staff schools, but are much less effective at keeping them there (See, Morris et al., 2020; see also Hanover Research, 2014; Nguyen and Springer, 2021; Podolsky et al., 2019; See, Gorard et al., 2020). “Offering remission of student loans, higher salaries or premiums for teaching in hard-to-staff areas and schools is effective in attracting teachers. However, it is not clear that such external motivation is desirable, or attracts the best teachers, and it is quite clear that the attraction is not lasting” (See, Gorard et al., 2020, p. 159).

Direct financial strategies pose a larger risk of inter-district competition for teachers, including the phenomenon of one district “poaching” another’s staff. These strategies at the district level can also give wealthier districts, which are generally perceived as better places to work, a distinct advantage in

[16] In Michigan, the previously noted residency program in Muskegon Heights also included a retention bonus tied to a new instructional framework and evaluation system (Middle Cities Education Association, 2021).

[17] Although the teacher licensing system in thirty states permits teachers to earn advanced certificates, only five of those states require or encourage additional pay for teachers with a higher-level credential (Evans et al., 2019).

[18] It appears that states sometimes with districts contributing reimburse teachers for the expense of obtaining NBC (Thomsen, 2016).

recruitment and retention. In addition, the plethora of incentive programs may result in the unintended and inefficient "packages" of multiple incentives that interact in complex ways to affect teacher decision-making (see Kolbe and Strunk, 2012).

PROGRAM AND REGULATORY STRATEGIES

Strategies in this section focus on non-financial means of promoting teacher retention: providing novice teachers early career supports and improving working conditions for all teachers.[19] Designed to improve the effectiveness and reduce the attrition of novice teachers, induction programs may include support strategies such as mentoring, reduced teaching loads through release time, and focused professional development (Carver-Thomas et al., 2022; Garcia and Weiss, 2020; Kini, 2022). More than 60% of states (31) mandate that new teachers receive induction and mentoring support, although the duration of the required programming, when specified, ranges from one to three years in most cases (Evans et al., 2019).

Twenty-two states provide for or promote decreased teaching loads for new teachers, or for the teachers assigned to mentor them; and eleven require designated teacher planning time during the work day or week (Evans et al., 2019). As a recent example, Illinois is investing over $12 million of federal pandemic recovery funds over two years to support district mentoring programs (Kini, 2022).

Research indicates that quality induction and mentoring programs are characterized by appropriate timing and duration, high standards, and the provision of strong criteria, training, and tools for mentors (Rowland Woods, 2016; see also Barth et al., 2016). There is evidence that such programs can improve novice teacher retention (Ronfeldt and McQueen, 2017; see also Carver-Thomas et al., 2022; Garcia and Weiss, 2020; Peske, 2022). Yet, implementation is known to be problematic, and so overall, "[t]he effectiveness of such programs … cannot be determined," at least with respect to recruitment and retention in high-need areas (See, Morris et al., 2020; see also literature cited in Ronfeldt and McQueen, 2017).

Researchers have understood "working conditions" that support retention in a variety of ways. One list includes "opportunities for teachers to professionally collaborate and contribute to decisions, school leadership that supports teachers individually and collectively, providing a collegial environment, and providing sufficient resources for teaching and learning" (Darling-Hammond and Podolsky, 2019, p. 8; see also Darling-Hammond et al., 2019; Garcia, Han, and Weiss, 2022; Podolsky et al., 2019).

A meta-analysis of teacher turnover correlates lists "school organizational characteristics" as including "reducing student disciplinary infractions, administrative support, teacher collaboration, targeted professional development, and classroom autonomy" (Nguyen and Springer, 2021, pp. 22-23; see also Hanover Research, 2014; Hughes, 2012). A common approach in the research lies in first identifying those factors that predict turnover—that is, why teachers leave—and then developing interventions designed to counteract those factors (Nguyen and Springer, 2021; Podolsky et al., 2016; Podolsky et al., 2019).

The overall idea is to foster a positive school culture and climate conducive to individual and collective teacher professionalism and efficacy (Garcia, Han, and Weiss, 2022; Hughes, 2012; Nguyen and Springer, 2021; see also Carver-Thomas and Darling-Hammond, 2017).

When resources allow (e.g., from federal relief funding) several more specific strategies to address staffing challenges through improving teacher working conditions may include: hiring additional support staff, reducing class sizes, and expanding time for teacher collaboration and for high-quality professional development (AFT Teacher and School Staff Shortage Task Force, 2022; Carver-Thomas et al., 2022; Jordan and DiMarco, 2022; Podolsky et al., 2019; Will, 2022a).

[19] Certain management measures districts can implement to mitigate staffing challenges at the margin when they arise include increasing recruitment, hiring capacity/activities, and improving administrative processes around hiring, training, transfer, and resignation (Podolsky et al., 2019).

As a recent example, New Mexico is using federal dollars so districts can hire educational assistants and financially support them as they pursue full teaching or related credentials (Will, 2022a; see also, regarding California districts, Carver-Thomas et al., 2022). Similarly, districts have acted to cut class sizes (Jordan and DiMarco, 2022), and funds are also being devoted to professional development around learning recovery strategies as well as the social-emotional impact of the pandemic on students and school staff (Jordan and DiMarco, 2022; see also Chu and Shen, 2022; Kini, 2022).

Even before the pandemic, many districts had begun to develop career advancement opportunities for teachers (Pennington McVey and Trinidad, 2019; Podolsky et al., 2019). These may involve teachers assuming leadership responsibilities and/or roles that involve the sharing of experience and expertise. These opportunities may come with a substantial increase in compensation, and often teachers can move into these roles while remaining by choice in the classroom part-time.

Structured sets of roles, a.k.a. teacher career ladders, may improve job satisfaction and reduce turnover (Podolsky et al., 2019). The District of Columbia Public Schools (DCPS) has at least three programs that promote career advancement through increased pay and leadership or peer support responsibilities (Erwin, 2022). Effective teachers can reach the top of the DCPS career ladder “after eight years in the classroom and take on new roles and responsibilities, ranging from mentoring new teachers to leading school-based improvement work, the sorts of professional opportunities that teachers say keeps them in the profession” (Toch, 2022).

GYO programs (discussed previously) originated as small, self-contained teacher pathways developed and implemented from end-to-end – that is, program recruitment through teacher employment – in a single school community (Skinner et al., 2011). Strongly rooted in concerns for equity, these programs depended on localized partnerships that fit community and adult participant needs, including wraparound financial and other supports (Garcia, 2020; Gist et al., 2019; Valenzuela, 2017). They were thus intended in substantial part as high recruitment and retention programs for individual schools or districts.

This type of GYO, as well as its residency program cousins, have continued or even expanded in states, particularly with state funding, technical assistance, and regulatory support (see Garcia, 2020; Gist, 2022; Muñiz, 2020). Limited empirical evidence suggests that GYO programs may improve recruitment and retention (Kaufman et al., 2020; Podolsky, 2019). Still, all types of GYO, residency, and similar programs face similar challenges, and further research is required to provide compelling evidence of scalability, sustainability, and cost-effectiveness (Garcia, 2020; Kaufman et al., 2020).

Policy and Practice Considerations

Proactively develop a coherent system of teacher workforce development policies and practices. Teacher workforce and staffing challenges involving well-known subject area, school, and candidate characteristics are a remarkably persistent feature of the balkanized teacher labor markets in the U.S. These challenges vary in scope and intensity across states and localities. There is also a recurring pattern of short-term anxieties related to teacher staffing issues leading to reactive adoption and shotgun implementation of short-term, ad hoc, disparate interventions.

The shock of the pandemic has created an urgency around teacher staffing challenges. But by exposing a long-standing need, it also presents an opportunity to systematize teacher workforce development efforts throughout the talent pipeline. A coherent, proactive, targeted approach is not only more likely to be effective, but also scalable and sustainable going forward.

Establish and coordinate institutional roles and responsibilities for addressing teacher staffing challenges. Despite decades of reform efforts, governance of the educational policy system remains decentralized, with many competing institutional actors, interests, and perspectives. This systemic feature is especially pertinent to addressing teacher workforce and staffing challenges, particularly given the nature of teacher labor markets, and the multiple levels of policy making and influence.

Yet, certain actors are better fit to play certain roles and undertake certain responsibilities. The state's fiscal resources and regulatory authority, for example, suggest a role supervising, incentivizing, and supporting more generally applicable teacher supply strategies to encourage cooperative uptake statewide – in other words, to focus on the strengthening of the overall labor market. With knowledge of local context, districts could focus on how to flexibly meet their particularized needs and conditions (albeit with state help). IHEs and other teacher preparation providers and partners could appropriately employ their expertise and other resources. There is in effect an institutional division of labor based on comparative advantage that if properly recognized and applied could leverage effective responses. What is required is a collective response, buttressed by a common vision and collaborative institutions. There is precedent for this approach in Michigan, where over the last several years the state has encouraged and developed ongoing partnerships among education preparation providers, LEAs, ISDs, and MDE, which certifies preparation providers and their programs.[20]

Align the structure and implementation of alternative policy tools to maximize overall impact while minimizing costly trade-offs among them. Although there is hardly a shortage of potentially promising strategies, the rub lies in strategy selection, specification, and application. Strategies differ significantly according to the broad dimensions of the typology including the intended effect on teacher workforce quantity, quality, composition, and distribution. This in turn requires the recognition of the trade-offs each strategy, or set of strategies, may entail.

Thus, commonly chosen financial strategies may be (relatively) quick and easy to adopt but more difficult and expensive to sustain. Changes in licensure requirements may be expedient in the short run but counter-productive in the longer term. The creation of local programs or attempted improvements in working conditions may bring longer-term, sustained benefits, but they also may be time-consuming, costly, and of uncertain impact. The teacher workforce and staffing challenges in each context, then, might best be addressed through an intentionally composed portfolio of policy tools, with strengths aligned to reinforce each and to balance out weaknesses. Whatever the strategies adopted, they will require sustained implementation—which means resources, institutional commitment, and thorough planning.

[20] There is a considerable amount of matchmaking that has taken place with education preparation providers, LEAs, and ISDs to address staffing needs at the district, regional, and state levels and more is in the process, aided by the $575 million FY23 appropriation for GYO ($175 million), scholarships ($305 million), and student teacher stipends ($50 million), among other efforts funded through the Michigan Department of Education.

Increase and improve the data collected on the teacher labor market and for policy evaluation. Research has shown inadequacies in the timeliness, content, and quality of the teacher workforce and staffing data. Data is indispensable for at least two purposes: (1) to develop the understanding of the structures and processes in teacher labor markets so that evolving challenges may be anticipated, and effective responses planned, and (2) to better evaluate teacher workforce and staffing policies and practices in context so that timely and responsive improvements may be devised and implemented.

The conduct of more rigorous, and so useful, research also depends on better, more “clean” and complete, accurate and accessible data at all levels and all along the teacher workforce pipeline.

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Appendix A: Model Typology

Commonly adopted and implemented at S = state level, D = district (or school) level, or S&D = both levels
Strategies often include conditions precedent or subsequent; they may be applicable or targeted by characteristics of place, school, teacher candidate, subject/content

Responses/ Strategies	Financial		Non-Financial	
	Shorter-Term	**Longer-Term**	**Shorter-Term**	**Longer-Term**
Expand Pre-Service Pipeline	• Student tuition tax credits (S) • Student teachers pay or stipend (S) • Decrease or reimburse teacher candidate fees (licensure, testing, etc.) (S) • Student educational/training scholarships, grants, subsidies, and stipends (S&D) • Retirement benefit loss waivers (S)	• Student loan forgiveness, grant or • repayment (S&D) • Student educational/training scholarships, grants, subsidies, and stipends (S&D) • State GYO, residency, alternative certificate pathway program partnership grants; student grants, scholarships, stipends (S&D)	• Lower or waive certificate requirements, incl low-tier certification, emergency certifications (S) • Decrease, waive, or eliminate teacher testing requirements (S) • Lower or waive re-licensing and other re-entry requirements (S) • Decrease inter-state certificate reciprocity conditions (S)	• Tiered certification systems (S) • Decrease certificate inter-state reciprocity conditions (S) • GYO programs – high school • students (S&D) • GYO programs – adults (S&D) • Residency programs (S&D) • Alternative certificate programs, pathways – IHE or non-IHE (S&D)
Improve In-Service Recruitment and Retention	• Student teachers pay or stipend to enter and stay in district (S&D) • Signing bonus (S&D) • Student loan forgiveness, grant or repayment to enter and stay in district (S&D) • Retention bonuses (S&D) • Targeted pay increase or stipends (D) • Salary sched credits (D) • Relocation incentives (D) • Subsidized housing, transportation, meals, access to local amenities (D)	• Across-board, on-sched salary increase, % or “flat dollar” (D) • Increase state-mandated min salary (S) • Targeted pay increase or stipends (D) • Alternative salary sched (D) • Retention bonuses (S&D) • Tax waivers, deductions, credits (S) • Additional credential or certification/endorsement (incl NBCT) bonus or salary increase (S&D) • Payment or reimbursement of expenses for additional credential or certification/endorsement (incl NBCT) • Increase pay for increased duties (D) • Career ladders or advancement opportunities with increase compensation (D) • Subsidized housing, transportation, meals, access to local amenities (D)	• Increase support staff hiring (D) • Reduce class sizes (D) • Reduce novice teacher class loads; allow teacher release time (D) • Tangible working conditions, such as physical plant, equipment, materials (D) • Increase recruitment and hiring capacity/activities (D)	• Career ladders or advancement opportunities with increased responsibilities and status (D) • Induction and mentor programs; other early career supports (S&D) • Working conditions, incl school factors; teacher professionalism and efficacy factors; school climate, management, and leadership factors (D) • Intra-district/school GYO and residency programs (S&D) • Improved hiring, training, transfer, and resignation practices (S&D)

Appendix B: Research-Based Considerations for Strategy Design and Implementation

Type of Strategy	Strategy Elements Contributing to Increased Likelihood of Efficacy and Impact

Strategies in General	• Funding sufficiency, stability, and sustainability
	  ▪ State funding or fiscal support
	• High-need positions targeted by:
	  ▪ Educational content/subject area (e.g., special education, ELL, STEM)
	  ▪ Community locale (e.g., rural, urban)
	  ▪ School (e.g., hard-to-staff, under-performing or underserved/economically disadvantaged or low-income student populations)
	  ▪ Teacher candidate (e.g., underrepresented in teacher workforce, paraprofessionals, adult learners, high school, two- or four-year degree students)
	• Program promoted and administrative burden minimized
	• State and local roles and supports aligned and coordinated
	  ▪ State technical assistance
	  ▪ State regulatory support (e.g., certificate/licensing structure and process)
	• Informed by multi-level labor market and program data

Financial Strategies	• Sufficient incentive amount relative to baseline teacher candidate costs or teacher compensation ▪ Targeted conditions on payment • Recurring or continuing incentive payments • Payment when incentive conditions met; otherwise, incentive loss or penalty • Direct payments to teacher candidate or teacher
Non-Financial, Programmatic Strategies	• Formalized, sustainable, and coordinated partnerships • Pre-service wraparound supports; in-service teacher practice supports • Include compensation for teacher candidate work; additional compensation for professional advancement • Integration of teacher education and professional practice • Attainment of educational degree and regular teaching certificate/license

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