



A National Scan of Existing Teacher Workforce Data Systems

The United States lacks a comprehensive system for teacher workforce data, a deficiency that poses substantial barriers to evidence-based policymaking and systemic educational improvement. This report aims to address that gap.

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Background

The United States lacks a comprehensive and nationally coherent system for the collection and analysis of teacher workforce data, a deficiency that poses substantial barriers to evidence-based policymaking and systemic educational improvement. This fragmentation is evident across multiple dimensions, including inconsistent state definitions, reporting standards, and data collection practices, limited capacity for longitudinal tracking, and little to no coordination among federal, state, and local education agencies.

At the federal level, the National Center for Education Statistics (NCES) collects limited information on the teacher workforce in the components of annual Common Core of Data collections that capture basic data on student enrollment and staffing levels for the universe of public schools and districts. NCES also collects more detailed teacher workforce data through periodic nationally representative surveys such as the Schools and Staffing Survey (SASS) and its successor, the National Teacher and Principal Survey (NTPS). The federal government also collects and provides data on teacher enrollment and completion for traditional and alternative teacher preparation programs (i.e., the Title II data from the Higher Education Act). The Civil Rights Data Collection (CRDC) provides information about teacher experience and qualification in every public school, but only every two to three years. Generally, these data are either not provided every year (SASS/NTPS and CRDC) or are several years out of date (Title II and CRDC data). As a result, these data sources are not well-suited for capturing fine-grained, real-time workforce dynamics that are important for ongoing policymaking. Appendix Table 1 provides the data source, variables reported, frequency/periodicity, latest year available, and level of granularity.

State-level data systems exhibit wide variation in both sophistication and scope. Some states have invested in comprehensive longitudinal data systems capable of tracking teachers from preparation through retirement and linking workforce records to student outcomes and educator preparation programs. In contrast, other states maintain rudimentary databases that meet only minimal federal reporting requirements. These requirements primarily relate to teacher qualification and certification status (under the Elementary and Secondary Education Act) and teacher preparation numbers (under the Higher Education Act). These disparities reflect differences in institutional capacity, political priorities, and fiscal resources (Data Quality Campaign, 2023; von Zastrow & Perez Jr., 2024; Wong, 2021). Moreover, states employ inconsistent definitions for key indicators—such as teacher turnover, teacher retention, shortage areas, and qualifications—rendering cross-state comparisons unreliable and limiting the ability to identify and interpret national patterns in the teacher labor market.

The consequences of this fragmented data infrastructure are significant. Policymakers do not have a consistent way to identify types of teacher shortages and where the needs are greatest, and for whom. Researchers face constraints in examining the relative effectiveness of different preparation pathways or identifying working conditions associated with teacher recruitment and retention. School and district leaders lack timely, actionable information to support workforce planning and staffing decisions.



Most critically, fragmented data systems mask the structural processes through which disadvantaged students are disproportionately taught by inexperienced, underqualified, or out-of-field teachers, thereby perpetuating educational inequities.

The creation of a truly integrated national teacher workforce data system would require sustained federal leadership, substantial financial investment, robust privacy safeguards, and coordinated action across historically autonomous state and local education agencies. In the absence of such coordination, educational leaders will continue to make consequential decisions about teacher recruitment, preparation, support, and retention based on incomplete and often inconsistent information, with enduring implications for the quality and equity of education nationwide.

Toward this end, it is critical to conduct a comprehensive examination of teacher workforce data systems across the United States. This important work will show a patchwork reporting landscape with significant variability in existing data infrastructure, data quality, and comprehensiveness. This scan illuminates both the progress made in recent decades and the persistent gaps that constrain our ability to understand and address critical workforce challenges. These latter gaps represent areas for future investment.



Objectives of the Study

This study aims to systematically examine the current state of teacher workforce data systems across all 50 states and the District of Columbia, identifying both exemplary practices and critical gaps that impede effective workforce planning and policy development. Through comprehensive analysis of existing data infrastructure, our research will produce actionable recommendations for strengthening policymakers' and researchers' capacity to understand and address teacher workforce challenges.

The first objective involves creating a consistent and detailed inventory of each state's teacher workforce data system, documenting data elements collected, existing infrastructure, and range of data elements that are publicly available. We examine what information states capture about teachers throughout their careers. Key dimensions of this scan include: vacancy and underqualification, demographic characteristics, certification and licensure status, and mobility patterns.

The second objective synthesizes findings from the system scan process to identify both exemplary practices and critical gaps requiring attention. Best practice identification will focus on states that have successfully implemented comprehensive data systems enabling sophisticated and timely workforce analyses. Gap analysis will document both cross-cutting deficiencies affecting most states and state-specific limitations.

The third objective translates analytical findings into practical recommendations for multiple stakeholders. For state education agencies, recommendations address technical infrastructure investments and strategies for enhancing data quality and completeness. Federal-level recommendations focus on developing common data standards and creating incentives for state data system improvements. The study will also propose recommendations for professional organizations and education researchers regarding how they can contribute to and benefit from improved data systems.

Ultimately, this study seeks to provide a roadmap for building the data infrastructure necessary to support evidence-based teacher workforce policy in an era of persistent staffing challenges and growing demands for educational excellence and equity.



Guiding Framework and Data Elements of Teacher Workforce Data

The teacher workforce data in the United States are complex, and they are composed of several interrelated data and measures. One purpose of this work is to provide a taxonomy of current and potential teacher workforce data along with the potential values of measuring each component as well as the limitations and disadvantages of each measure. We consider a range of possible measures of the teacher workforce. First, when teacher shortage is discussed in the news and popular press, this term is loosely defined as it can mean vacant positions that are not filled as well as positions held by teachers who are under-qualified to hold said positions.

Consequently, we break shortage measures down into two specific components: teacher vacancy and teacher qualification. Additionally, as teacher turnover and teacher production contribute to the overall teacher labor market and have direct implications for vacancy and qualification, we also discuss these two measures. Relatedly, teacher compensation also influences how desirable the teaching profession is, which affects the teacher supply, and with changing student enrollment from state to state there is also substantial fluctuation in terms of teacher demand. As such, we spend considerable time explicating their influence on the teacher workforce. Last but not least, an additional consideration of the teacher workforce is the demographics of the teachers, which we also discuss as this has implications for student learning and representation.

Vacancy

Vacancy is most often defined as a position that is unfilled or that is filled only on a temporary basis. Vacancy, in some ways, most closely aligns with standard uses of “shortage” in the labor market. One way to think of vacancy is the gap between what level school leaders would like to hire up to (subject to their budget constraints) and what level they are able to hire up to. Vacancy indicates something relatively concrete about a gap in service provision to students in a way that other measures of staffing difficulty (e.g., observable teacher qualifications) may not. By incorporating information about demand, vacancy measures can help to guide policy to not just increase the teacher supply in general, but also match the supply of teachers to available positions. For example, focusing entirely on maximizing the supply of teachers could create inefficient surpluses of teachers, resulting in depressed wages, underemployment, and so on. Moreover, there is considerable evidence that shortages vary dramatically between regions, districts, schools, and so on (Bruno, 2025, 2026; Edwards et al., 2024; Nguyen, Lam, et al., 2024; Wyckoff, 2024). Therefore, usually being measured at a more granular, position level, vacancy data can help target policy interventions at the regions, districts, schools, position types, etc., where shortages are most severe.



There are, however, limitations and disadvantages to data collection on vacancy. To start, what counts as a “vacancy” is potentially hard to define (e.g., as in the case of a position that is filled on a temporary basis). Because opening a position to fill is substantially discretionary, vacancies may disproportionately understate teacher supply challenges in contexts where the teacher supply is weakest (and school leaders perceive the least benefit in even attempting to open and fill a position). Moreover, vacancies do not indicate anything clearly about absolute levels of service provision to students, though they may be mistakenly interpreted that way. For instance, teacher vacancy rates can increase even as the total number of teachers employed increases or as the student: teacher ratio falls. In terms of logistical disadvantages, vacancies are relatively distant from the type of data schools and districts typically report, which tend to focus on employed staff who are assigned to roles rather than positions that could be vacant. This increases the relative difficulty of collecting vacancy data. Moreover, vacancy data are potentially prone to reporting biases because school leaders often have considerable discretion over whether to create a position. Besides these decisions tending to be related to pre-existing staffing challenges (as noted above), this discretion could potentially create challenges if vacancy data are used in higher-stakes or public-facing ways. For instance, if vacancies are considered unattractive, schools may choose not to create or report them. Conversely, if state aid is targeted to agencies with higher vacancy rates, this may create incentives to open more positions than leaders otherwise would.

Qualification

Teacher qualifications can provide some information about the strength of the teacher labor supply that other measures do not. For instance, school leaders may choose not to open positions that they do not expect to be able to fill, depressing vacancy rates even in the presence of staffing challenges. In such cases, weak or deteriorating credentials among employed teachers may still allow staffing challenges to be observed. This may be particularly true for qualifications such as emergency teaching permits or waivers of credentialing requirements, which often require administrators to demonstrate that a position could not be filled by a fully-licensed candidate. A key advantage of teacher qualification data is that they are already widely collected. This reflects a variety of pre-existing demands on school districts to document teacher qualifications for complying with state or federal teacher qualification requirements (e.g., for licensure) or for determining compensation (e.g., education and experience). Teacher qualifications can typically be disaggregated at relatively granular levels, including down to the classroom level or otherwise linked to individual students. This allows finer analysis of where supply problems are most severe, including how those supply problems can manifest within the school.

In terms of limitations and disadvantages, observable teacher qualifications are often not strong predictors of teacher quality (Bastian, 2018; Buddin & Zamarro, 2009; Chingos & Peterson, 2011; Clotfelter et al., 2010; Goldhaber, 2007; Harris & Sass, 2011; Henry et al., 2014; Palardy & Rumberger, 2008; Rockoff et al., 2011), though they may be incorrectly interpreted that way.



Some of the teacher qualifications more meaningfully associated with quality and effectiveness that might be used are subject-specific preparation and experience (Bastian, 2018; Bastian & Fortner, 2018; Chen et al., 2022; Clotfelter et al., 2010; Cook & Mansfield, 2016; Sancassani, 2023), additional years of teaching experience, especially distinguishing different amounts of early-career experience (Chingos & Peterson, 2011; Clotfelter et al., 2006, 2010; Harris & Sass, 2011), and National Board certification (Bruno, in press; Cantrell et al., 2008; Chingos & Peterson, 2011; Clotfelter et al., 2010; Cowan & Goldhaber, 2016; Goldhaber, 2006; Horoi & Bhai, 2018). Given the crudeness of many observable measures of teachers' qualifications, giving specific, uninformative observable measures of qualification more attention risks misallocating our attention to teacher quality. Conversely, collecting new, and hopefully better, teacher qualification measures could imply greater collection costs. For instance, school districts may currently collect better information about teachers' highest degree obtained than they do about whether those degrees are aligned to teachers' assignments or content areas, though the latter would likely be more informative than the former.

Turnover

There are various forms of teacher turnover that researchers and policymakers have examined. Some specific forms of turnover include within-district switching, between-district movement, temporary leave, and permanently leaving the workforce. Some researchers have distinguished between different possible outcomes of teachers at the end of the school year, including exiters, switchers, movers, and stayers (e.g., Camp et al., 2024). Exiters are teachers who leave the education workforce, switchers change from a teaching to a non-teaching role, movers leave their current school to teach in another school, and stayers remain in a teaching role at their current school.

Generally, the most studied form of teacher turnover is teachers leaving their current school, whether for another school or leaving the profession altogether. As such, we focus on this operationalization here. Most importantly, teacher turnover, probably more than other indicators about the teacher supply, has been credibly estimated to have both direct and indirect negative effects on students and schools (Atteberry et al., 2017; Hanushek et al., 2016; Ronfeldt et al., 2013; Watlington et al., 2010). Teacher turnover measures can typically be disaggregated to understand variation across positions, schools, districts, and so on. This is potentially important because, as with many aspects of the teacher supply, teacher turnover is known to vary substantially across contexts (Lam et al., 2025; Nguyen, 2020). Surveys (e.g., about self-reported turnover intention among teachers) cannot reliably proxy for teacher turnover, though they may be informative in other respects (Nguyen, Bettini, et al., 2024).

There are limitations to measuring teacher turnover. Some teachers can be difficult to link to specific school sites, perhaps most commonly because they provide services to multiple sites within a school district. By and large, this is a small population of teachers and has not been a big concern for the teacher workforce.



Another, more challenging, nuance is around the effects of teacher turnover, which can operate through different channels to affect different outcomes. For example, while the average effects of teacher turnover on student outcomes appear to be negative, under certain circumstances incentivizing early retirements among teachers may be financially prudent (Fitzpatrick, 2014). Moreover, under certain circumstances teacher turnover may be detrimental to the quantity of teachers by removing some from (at least the local) teacher labor market but improve the quality of the teacher workforce. Indeed, this is often the goal – and even the outcome – of strategic efforts to improve overall teacher workforce quality (Adnot et al., 2017; Dee & Wyckoff, 2015; Fitzpatrick & Lovenheim, 2014; James & Wyckoff, 2020). This makes teacher turnover at least potentially ambiguous as a signal about quality of the teacher supply, particularly in specific schools or districts, even if it is a clearer signal about the size of the teacher supply. Since teacher turnover can, in some cases, be desirable in terms of quality, highlighting turnover as a negative signal about the teacher workforce could distort decision making by school leaders.

A further logistical challenge is that while schools already collect substantial amounts of information about site-level assignments for teachers, measuring turnover requires making decisions about how to use that information to characterize teacher turnover.

Another complication related to collecting and reporting information about teacher turnover is that the different types of turnover we mention above (e.g., switching schools vs. switching districts) have potentially different implications for decision makers. This means it will not always be obvious what type of turnover is most useful to report. For example, the rate at which teachers move schools within a given school district might be more informative for families or teachers choosing schools in a district than it is for state policymakers. However, teachers switching schools in this way remain in a given districts' employment and in the state's teacher labor force, which may make within-district switching less salient from these stakeholders' point of view. One possible approach is to publish data that disaggregates teacher turnover by the specific type of turnover, though this may substantially complicate data reporting for both reporting agencies and for those trying to interpret it.

Production

The rates at which prospective teachers are enrolling in teacher preparation programs and completing these programs are relatively concrete information about the supply of teachers and how it is changing over time. Teacher production can be disaggregated by grade level, subject, and so on, which is important because these labor markets are largely distinct; teachers with different licenses, preparation areas, or subject expertise are largely non-substitutable. In principle, teacher production – whether enrollment or final licensure – can be geographically disaggregated by institution; this can help to understand regional variation in school staffing difficulties.

Individuals who have completed teacher preparation programs and are newly licensed to teach often do not enter the teacher labor market or may already have been in the teacher labor market (e.g., because they are earning an additional certification to teach a new content area).



This can complicate the use of teacher production as an indication of the teacher supply (Cowan et al., 2016; Goldhaber et al., 2022). While data systems for teacher production are common, they are often distinct from, and operate on slower timelines, than other administrative data systems in K-12 education. Integrating, speeding up, or otherwise improving teacher production data systems could be relatively resource-intensive and require political will (e.g., because institutions of higher education would have to be willing and able to report information more rapidly or in more detail).

Teacher demographics

The diversity of the teacher supply matters, for example, because students often appear to benefit from having same-race or same-gender instructors (Bottia et al., 2015; Carrell et al., 2010; Dee, 2004; Egalite et al., 2015; Egalite & Kisida, 2018; Gershenson et al., 2022; Holt & Gershenson, 2019; Lim & Meer, 2017, 2020). Yet the teaching force has long been much Whiter and more female than the student population (U.S. Department of Education, National Center for Education Statistics, 2022a, 2022b). School systems already commonly collect information on teacher demographics, suggesting little additional administrative burden to doing so.

As with many readily-observed teacher characteristics, teacher demographics are at best highly imperfect indicators of the quality of instructional experiences students can expect from those teachers. This is perhaps even more true of demographic information about teachers, as the evidence that these characteristics matter focuses primarily on complicated issues of alignment between students and teachers, rather than general teacher quality. The use of demographic information, such as information about race and gender, can also be politically contentious.

Additional considerations for teacher workforce data reporting

Up to this point, we have considered data that are in some sense about the teacher workforce. Different workforce data have different affordances and limitations, but one likely unavoidable challenge is that data about the teacher workforce are inherently challenging to use and interpret. This matters because we assume that the goal of presenting any data about the teacher workforce is to inform decision making, and it is unlikely that any data about the teacher workforce can, alone, usefully inform decisions. There are at least two common and fundamental challenges to interpreting and using teacher workforce data.

First, such interpretation often requires context about the school system. Moreover, the *potential* contextual information that might be useful for understanding and using teacher workforce data is too vast to exhaustively catalog. For present purposes, we consider two types of contextual information that are not directly about the teacher workforce *per se* but that are likely to be broadly relevant: information about *drivers of the teacher workforce* and information about *implications of the teacher workforce*. For each, we briefly describe its possible relevance and provide one illustrative example of data that might usefully complement data on the teacher workforce.



Second, teacher workforce data, even if reported along with other contextual information, can be difficult for users to access and interact with. We therefore briefly consider one common data reporting approach commonly used to facilitate data access and use: presenting data in dashboard form.

Drivers of the teacher workforce: Compensation

It is likely that one common goal of collecting teacher workforce data is to inform decisions about how to improve the teacher supply. Teacher workforce data alone cannot do this because, by definition, such data do not provide reasons why the workforce is not stronger or weaker than it is observed to be. Consequently, it may often be useful to collect and report information about factors that could cause the teacher workforce to increase or decrease in quantity or quality.

Consider teacher compensation as an example. There is considerable evidence that the teacher workforce is sensitive to compensation (Clotfelter et al., 2008; Cowan & Goldhaber, 2018; Feng & Sass, 2018; Hendricks, 2014, 2015; Morgan et al., 2023; Protik et al., 2015; Steele et al., 2010; Theobald et al., 2025). Data about the teacher workforce are relatively difficult to interpret – and intervene on – without contextual information about drivers of teachers’ decisions, and this will often include compensation. School districts already need to maintain records about teacher compensation, making compensation data relatively easy to publish and disseminate.

That said, while compensation is an important driver of the teacher workforce it is not the only driver that matters. For example, there is considerable evidence that teachers are sensitive to aspects of their working conditions such as school leadership, workload, and organizational culture (Johnson et al., 2012; Kraft et al., 2016; Rogers & Bartanen, 2025). Substantial amounts of teacher compensation are in the form of health and welfare benefits and/or deferred compensation such as retirement benefits. These forms of compensation are often missed by existing data collection systems, are hard to quantify in any case, and have more complicated or less certain relationships to the teacher workforce than does salary (Backes et al., 2016; Biggs, 2023; Bruno, 2019, 2021; Fitzpatrick, 2014, 2015, 2017; Fitzpatrick & Lovenheim, 2014; Kim et al., 2019; Koedel et al., 2013; Koedel & Gassmann, 2018). Again, the potential drivers of the teacher workforce are too diverse to fully consider here, so decisions about what such data to collect and report should be motivated strategically.

Implications of the teacher workforce: Student enrollment

Besides wanting to know why the teacher workforce is as observed and how it might be improved, data about the teacher workforce are often difficult to interpret because it is rarely obvious whether any particular supply of teachers, specifically the increase of potential teachers, is adequate.



Thus, even if the teacher supply is well characterized and potential levers for improving the teacher supply have been credibly identified, it will often not be clear whether intervention is warranted. Such decisions probably cannot be reliably adjudicated with even the best data, as they are inherently normative. Still, it is helpful to consider whether some data might usefully help determine whether there are problems in the teacher supply and when and how to intervene.

For example, consider student enrollment. Student enrollment provides potentially important information about the demand or need for teachers. Teacher supply data are difficult to understand without context about the student population being served. For instance, the raw number of teachers who are employed or teaching positions that are vacant means little without some information about how those numbers compare to the student population (e.g., the student: teacher ratio). Student enrollment information is typically already collected by school systems for a variety of reasons, and these data are generally high quality (e.g., because they are used in funding calculations) and can be finely disaggregated (e.g., to the school level or lower).

Students have varying educational needs. Consequently, the number of students may be misleading about the instructional needs of those students and the associated teacher supply requirements. For example, students may have English learner needs in one school or district but not another, and students may have different likelihoods of being diagnosed with a disability over time. These limitations are potentially ameliorated by the fact that school systems typically collect a variety of other information about individual students beyond their enrollment, such as family income, prior achievement, disability or English learner status, and so on. Such information can be used to better understand varying student needs and varying teacher staffing needs. We do not foresee substantial disadvantages to collecting student enrollment data.

Presentation of teacher workforce data: Dashboards

Somewhat distinct from the question of what data to collect and publish is the question of how to make data engaging and useful to potential stakeholders or decision-makers. One common approach to this challenge is to integrate datasets into “dashboards” that users can interact with in (hopefully) intuitive ways to learn about specific data points or broader patterns without needing to work with more esoteric file formats. Relative to alternatives such as downloadable data files, data dashboards may help to gain attention from stakeholders, so that they focus on relevant data for their decision-making. A teacher workforce dashboard could give policymakers a centralized view of critical workforce data that would otherwise be located in disparate reports or datasets. By presenting this information visually and accessibly, a dashboard enables policymakers to quickly identify emerging problems, compare trends across districts or school types, and assess whether existing interventions are working.



Summary

We hope this discussion makes clear that there is a wide range of teacher supply-related data that could be collected, and that each has advantages and disadvantages that make them more (or less) attractive for different purposes. Consequently, no single measure is ever likely to suffice for informing policy or practice. This motivates our use of all of these measures in our scan of the existing landscape of teacher workforce data systems.



The Current Landscape of Teacher Workforce Data Systems

Effective policymaking to improve the teacher workforce requires good data. To understand states' data collection infrastructures and data availability, we follow a systematic process to scan and analyze to conduct a nationwide scan of publicly available teacher workforce data and states' data collection infrastructure.

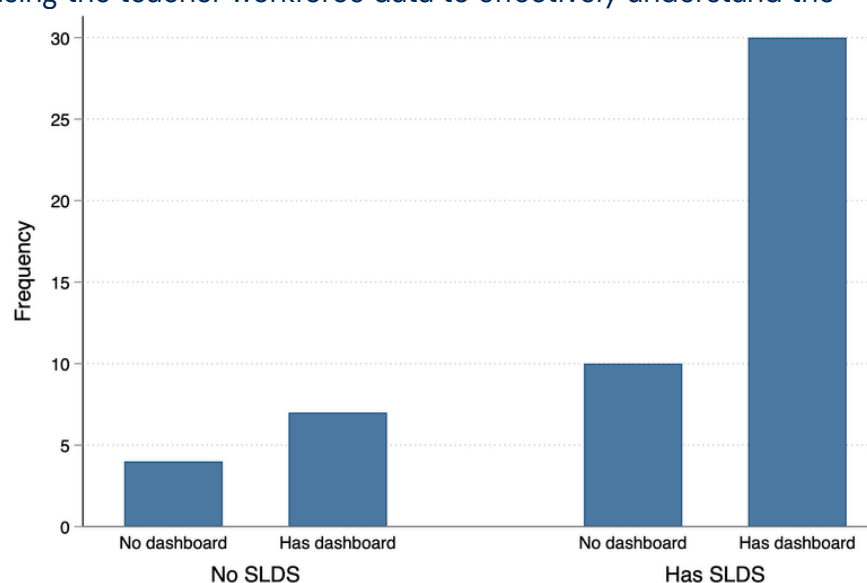
For each state, including D.C., we conduct a Google search to find the state's state longitudinal data system (SLDS) and whether it is active and operational, inactive or non-operational, or has never existed or is being created. SLDS can be important infrastructure investments for monitoring the state of the teacher workforce and its implications for students.

For each state, we also conduct multiple searches to understand what teacher workforce data are made available to the public, for use by decision-makers, advocates, researchers, and other stakeholders. We consider two main types of teacher workforce data. First, we look for data plausibly indicating the presence of teacher shortages, in the form of counts or rates of teaching positions being vacant or filled by underqualified candidates (however, such qualifications are defined by states themselves). Second, we look for data on the teacher workforce in the form of rates at which teachers turn over, switch schools, or exit the profession.

For these data sources, we additionally consider whether they are downloadable and/or available to view in a dashboard. For many of these measures of the teacher workforce, we also collect data on whether the state clearly defines the measure, the level at which the data are provided (e.g., state or district), and whether data are broken out by subject area (e.g., STEM, special education). These are the data elements discussed previously that would be very useful in accessing and using the teacher workforce data to effectively understand the teacher supply.

See Table 1 for more details on the data collected and definitions. Below, we discuss the main findings from our search.

Figure 1. Publicly available teacher workforce data



SLDS and dashboard availability

With Figure 1, we begin by examining which states have a SLDS. We find that forty states have an active and operational SLDS while ten states and D.C. do not. For instance, Iowa does not have an SLDS, Alaska's SLDS has been decommissioned, and California is currently putting together an SLDS (some California teacher workforce data do exist but they are fragmented and have not been collected together as a whole for the state). Of the forty states with SLDS, thirty states (75%) have a publicly available dashboard that includes at least some of our teacher workforce data of interest, while ten states (25%) do not. Of the 11 states, including D.C., without an active SLDS, seven (64%) have a teacher workforce dashboard while four (36%) do not. These data clearly illustrate that there is substantial variation in just whether there is an active and operational SLDS and whether there is a dashboard of pertinent teacher workforce data. Specifically, while most states have active and operational SLDS, many states do not, and similarly, most states have publicly available dashboards that contain some information about their teacher workforce.

We delve deeper into this issue by examining whether states have teacher workforce dashboards that facilitate use of specific types of teacher workforce data. For instance, we examine whether states have any teacher workforce dashboard, and whether those dashboards include access to data on vacancy, different measures of turnover, or underqualification (Figure 2).

These results indicate that the majority of states have teacher workforce dashboards of some kind. The most common dashboard is for teacher underqualification, followed by teacher demographics and teacher turnover. About ten percent or so of states have data on vacancy, leaving, or switching available in a dashboard.

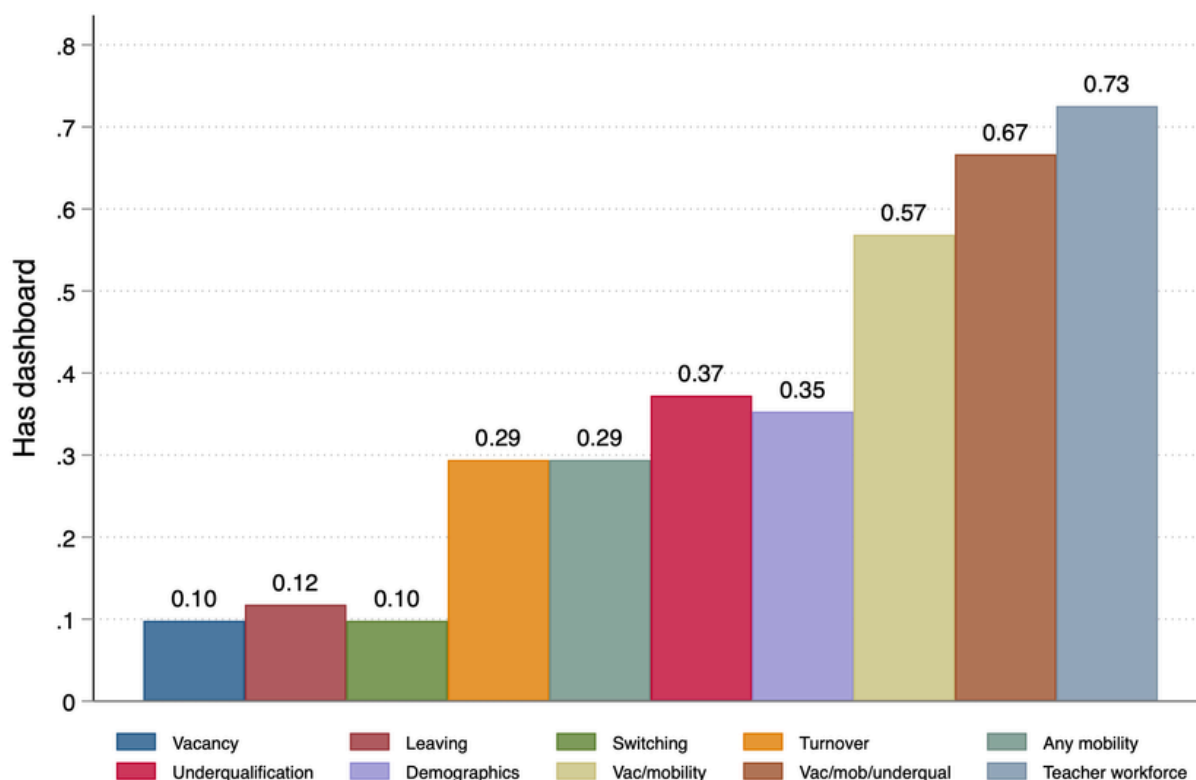


Figure 2. Teacher workforce dashboard by various measures



Teacher workforce data availability

Beyond examining the extent to which states have active and operational SLDS and publicly available dashboards, we dig deeper and examine what specific measures of the teacher labor market states provide and at what level. Specifically, we examine teacher vacancy (teacher job postings that are not filled by a specific point during the school year, usually at the beginning of the school year), turnover (when a teacher leaves their current school), leaving (teacher leaves district or state), switching (teacher move from their current school to a different school in the district or the state), and underqualification (teachers who do not have standard certification or are teaching out of subject endorsement).

As illustrated in Figure 3, the majority of states do not have publicly available data on most measures of the teacher labor market. Teacher vacancy data, for example, are not available on a dashboard for 38 states, including D.C. Of the 13 states that have a vacancy count, six provide these data at the state level while seven provide them at the county, district, or school level. This is reflected in previous research that has documented the difficulty of finding teacher vacancy data nationwide (Nguyen, Lam, et al., 2024). While some states do have vacancy counts, they are sometimes difficult to find and are not easily available to the public or researchers (e.g., they may be reported to the press).

To varying degrees, we also see similar patterns reflected in teacher mobility measures (turnover, leaving, and switching). For instance, 32 states do not provide teacher turnover data on a dashboard, and more than forty states do not provide data on teacher leaving and switching schools. Of the states that provide these data, they are most often provided at the state level and rarely at the school level.

The one measure that is more consistently available is teacher underqualification. Only 16 states do not provide underqualification data while 22 states provide them at the state level and 13 at the district or school level. One potential reason why teacher underqualification data are more readily available is because of No Child Left Behind's previous push for "highly qualified teachers," but when ESSA replaced NCLB, states may have let this go. Vacancy measures are not required by federal law or regulation, and mobility measures require effort and capacity to track teacher mobility over time.



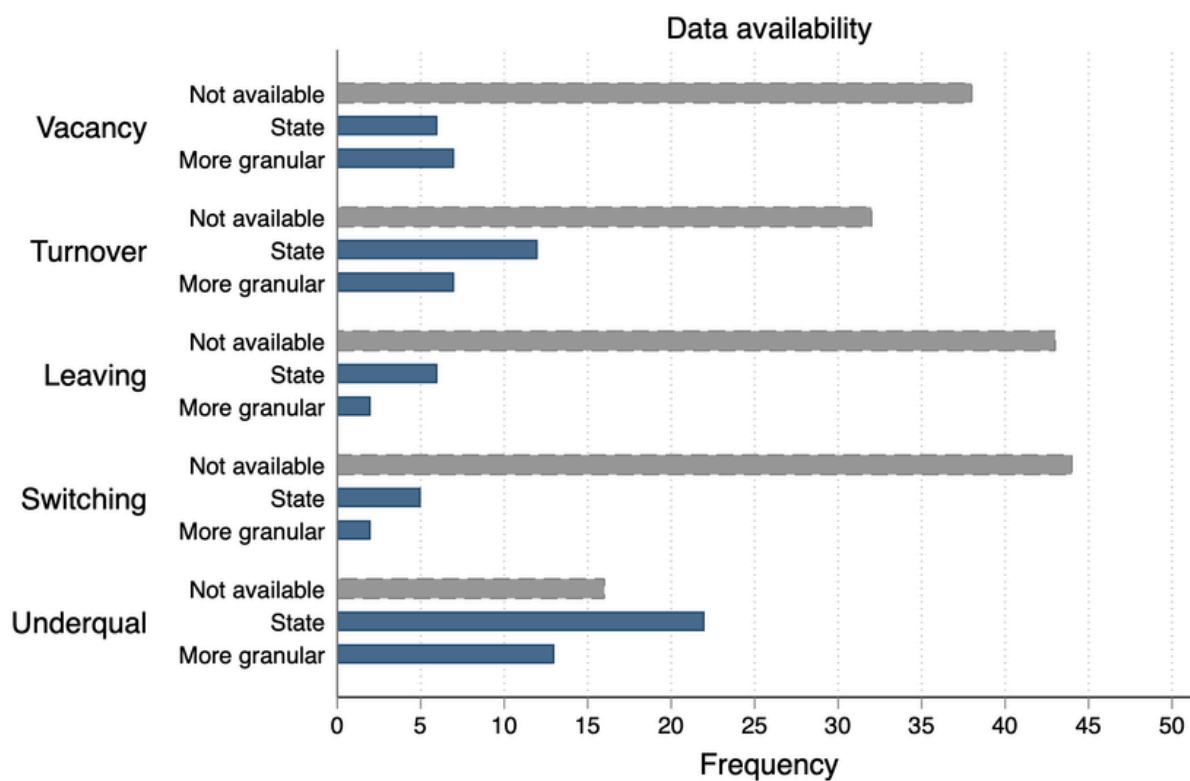


Figure 3. Data availability on different measures of teacher workforce

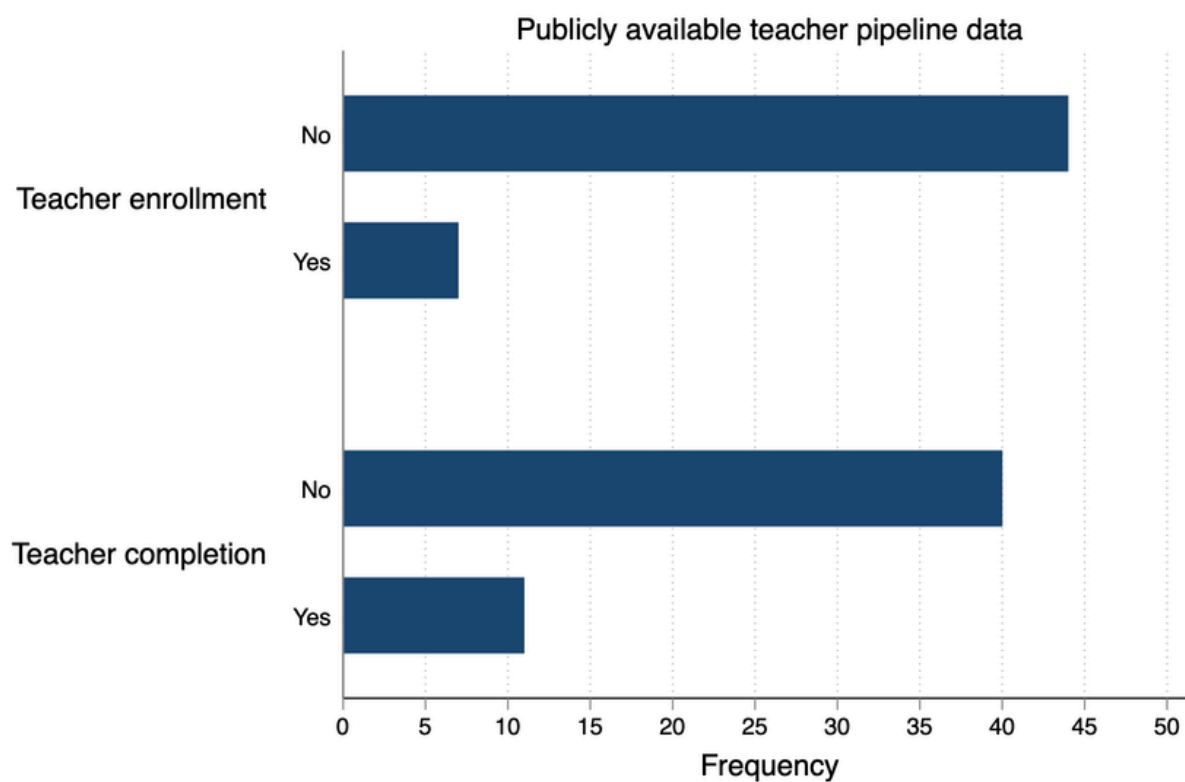


Figure 4. Data availability on teacher enrollment and completion

In addition to examining different measures of the teacher workforce, we have data on teacher enrollment and completion (Figure 4). In particular, seven states provide data on teacher enrollment and eleven states provide data on teacher completion. The results indicate that the vast majority of states have data on teacher enrollment and completion as they report them for the Title II data collection. However, states do not provide data on teacher enrollment and completion publicly and certainly not in a timely manner. In short, there is limited timely information on what the teacher supply looks like at the state level.

We also track the extent to which states provide underqualification data by subject level (e.g., science, math, special education). Figure 5 shows that the vast majority of states do not provide these data. In particular, only nine states provide underqualification data by subject level. This illustrates how difficult it would be for researchers and policymakers to examine the extent to which teachers are underqualified to teach by subject areas. Since the teacher labor market is localized by location as well as subject expertise, reforms to increase teacher recruitment and retention need to be targeted, which would be difficult to achieve without knowing how many underqualified teachers are by subject areas and where.

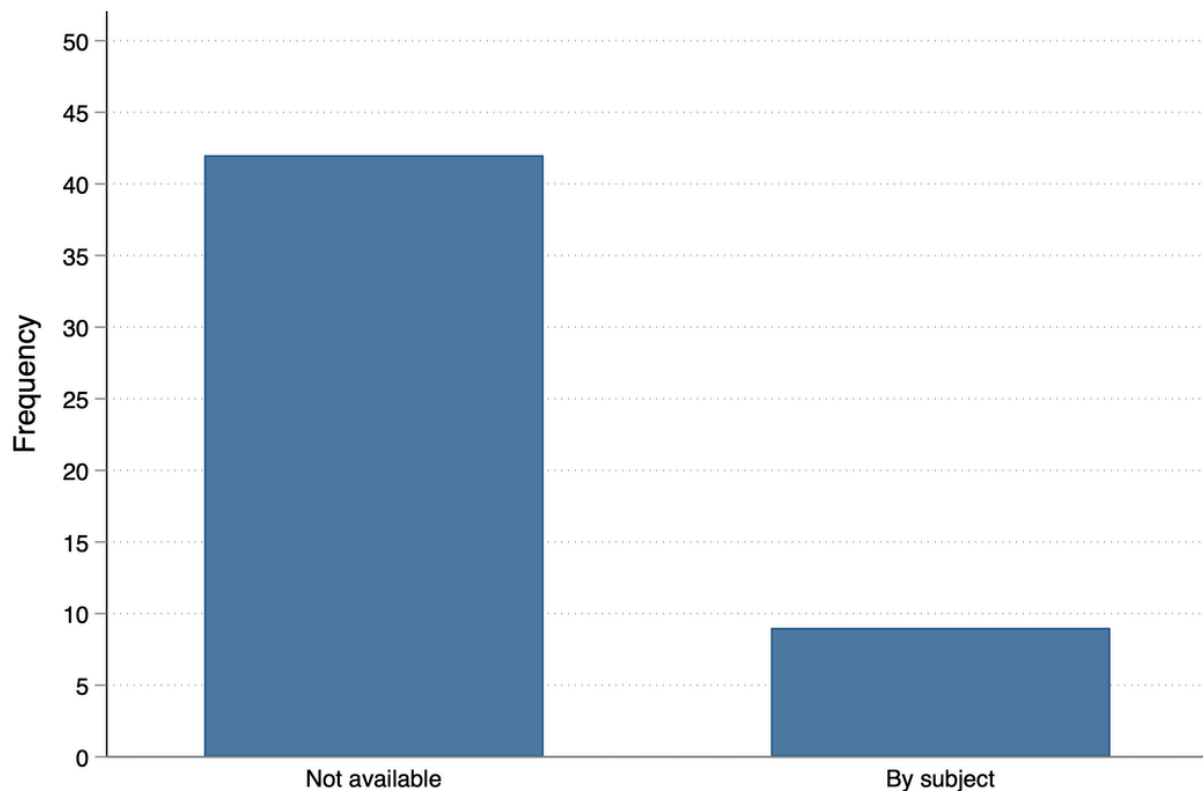


Figure 5. Underqualification by subject area

Exemplars and best practices

In terms of best practices, we discuss some exemplars here (Illinois and Pennsylvania) as well as our thoughts on the best practices that states can undertake to provide teacher workforce data to the public. For these two states, the teacher workforce dashboard is fairly easy to find. They all contain information on each of the measures of the teacher workforce and provide some clarity about how the measures are defined (e.g., what constitutes teacher underqualification). Moreover, they often provide those measures at a relatively fine level. For instance, in the Illinois dashboard, you can find teacher vacancy data at the state, district, and school level, and you can also find information on teacher turnover, leaving, switching and underqualification. Moreover, Illinois makes public downloadable data files that distinguish vacant positions for different types of teachers (and other certificated staff) at the school level. Some states, such as Missouri, have data on parts of the teacher workforce (e.g., vacancy) but not others (e.g., leaving), and most of the time, they are only provided at the state level, and not more granularly (e.g., at the district level). In addition to having the dashboard providing these data, Illinois and Pennsylvania have also done a great job of making their dashboard easy to navigate. They are interactive, and they allow the users to examine the teacher workforce from different perspectives.

One consideration for states is whether teacher workforce data are most usefully presented within interactive dashboards or downloadable data files. On the one hand, data dashboards are more “user-friendly” because, if well-designed, they require little technical skill to operate and manipulate. Dashboards may also be attention-grabbing in ways that are useful for mobilizing stakeholder interest, at least if used strategically. On the other hand, downloadable data files allow for more flexible analyses, including more elaborate comparisons between schools and over time, and comparisons that involve combining different data sources (including, potentially, data sources not collected or made public by the state).

It is likely that any data that can be presented in a dashboard can also be made available as downloadable files, as such files are likely a prerequisite for producing the associated dashboards in the first place. Indeed, a number of state dashboards include options to download data directly in their interfaces. However, this practice is not uniform, and we recommend all states that have gone to the trouble of creating dashboards make the underlying data available in machine-readable format (e.g., CSV or Excel formats) for use by researchers and other stakeholders.

We are more agnostic about whether it is worth the investment of incorporating any given downloadable data file into a state’s dashboard. The benefits of such an investment may depend on what else is in the dashboard and how much use the dashboard receives.



Recommendations for Strengthening Teacher Workforce Data Systems

Based on this work and our expertise in this area, we make four key policy and practice recommendations: 1) Establishing common definitions and data standards; 2) Improving data collection infrastructure; 3) Enhancing cross-state collaboration and data sharing; and 4) Increasing transparency and accessibility for policymakers, researchers, and the public. Below we discuss each of these recommendations in more detail.

Establishing Common Definitions and Data Standards

The foundation of improved data systems lies in developing and adopting standardized definitions for workforce metrics. Yet, in our scan, we found repeatedly that even when data elements were collected, published, and defined, those definitions were sometimes confusing and frequently differed from definitions used in other states. Federal agencies, in collaboration with state policymakers and researchers, should establish common definitions for teacher retention, attrition, shortage areas, and preparation pathways. For instance, this includes creating consistent definitions and measures for distinguishing between teachers who move to different schools, move to a different district within the same state, move to a different state but still teaching, or exit the profession entirely—distinctions often conflated in current reporting.

Technical data standards must specify common data elements, formats, and collection frequencies. States should implement common coding schemes for certification types, endorsement areas, and preparation program categories that reflect the contemporary diversity of pathways into teaching. These standards should balance comprehensiveness with practicality, recognizing that overly burdensome requirements may compromise data quality or discourage participation. The development and adoption of a universal teacher identifier system that functions across state boundaries while protecting privacy would substantially broaden policymakers' and researchers' ability to track teacher mobility and career trajectories, potentially enabling them to study how and why teachers move from one state to another (e.g., different incentive structures and working conditions). An example of a national collaborative effort along this line is the Common Education Data Standards (CEDS, n.d.), an initiative to develop common data standards and streamline accessible data within and across P–20 institutions and sectors.



Improving Data Collection Infrastructure

States require sustained investment in the technical infrastructure supporting teacher workforce data systems. This includes modernizing legacy systems, implementing automated data validation procedures, and establishing regular data quality audits. Priority should be given to capturing currently missing information, particularly data on teacher working conditions, reasons for departure from positions or the profession, and comprehensive pipeline data linking college enrollment through preparation programs to workforce entry and retention.

District-level capacity building is equally critical. Many districts, especially rural, smaller and under-resourced districts, need support implementing human resources information systems capable of interacting with state databases. Federal and state grant programs should prioritize funding for technical assistance, training, and potentially subsidizing data system improvements for districts lacking resources to modernize independently. A different approach would be for states to create a standard data system that could be implemented statewide. In any case, data collection burdens on school and district leaders should be minimized for both political and substantive reasons, for example by prioritizing the data system's ease of use and automaticity.

Enhancing Cross-State Collaboration and Data Sharing

States should develop reciprocal data-sharing agreements enabling tracking of teachers' complete career histories regardless of where they work. This would promote both data quality (e.g., if teachers can be tracked across state lines) and efficiency (e.g., if state networks have more capacity to invest in higher-quality, easier-to-use data systems or have technical lessons to share with each other). This requires not only technical but also legal frameworks addressing privacy protections, data governance, and appropriate use policies. Federal leadership may be useful for facilitating this collaboration. The Department of Education should convene states to develop interstate data compacts, provide technical assistance for implementation, and potentially offer competitive grants incentivizing participation. Regional collaborations among neighboring states facing similar workforce challenges could serve as pilots for broader national coordination. These efforts must prioritize robust privacy protections, establishing clear guidelines about who can access data, for what purposes, and with what safeguards against misuse.



Increasing Transparency and Accessibility

States should develop user-friendly dashboards and data visualization tools enabling policymakers, district leaders, researchers, and the public to access workforce information without requiring technical expertise. These dashboards should present data at appropriate levels of aggregation to protect individual privacy while enabling meaningful analysis of trends and patterns. However, given the costs of producing and maintaining these dashboards, we also recommend that states collect and monitor data on how and how frequently these dashboards are used.

Researchers and policymakers could access more granular data through secure systems with appropriate use agreements and ethical oversight. States should establish clear, streamlined processes for researchers to access de-identified data for legitimate research. Finally, states should publish annual workforce reports synthesizing key trends and placing data in context, making sophisticated analyses accessible to broader audiences concerned about teacher quality and educational equity. Researchers may be useful partners in building capacity for this work, as many researchers would gladly produce policy-oriented reports on behalf of school systems in exchange for data infrastructure and access.



Building a National Teacher Workforce Data System: A Strategic Roadmap

The development of a coherent national teacher workforce data system requires a short- and long-term approach that balances immediate improvements with long-term structural reform. Such a system should support policy analysis, research, and workforce planning while safeguarding privacy and respecting governance structures. A strategic roadmap can be organized around short-term and long-term actions, supported by cross-sector partnerships among key stakeholders.

Short-term actions (1–4 years)

In the short term, we would advocate prioritizing alignment, capacity building, and infrastructure readiness. First, federal leadership should convene states to establish a core set of common definitions and minimum data elements for teacher workforce metrics, including preparation pathways, certification status, teaching assignments, retention, and mobility. These standards could build on existing frameworks, such as the CEDS, while explicitly addressing gaps related to teacher supply, demand, and distribution.

It may also be worthwhile to consider providing targeted federal grants that would support state efforts to modernize educator data systems and improve interoperability between district, state, and federal databases. Investments should focus particularly on states and districts with limited technical capacity to avoid exacerbating existing inequities. Third, pilot initiatives should test the feasibility of linking teacher workforce data with educator preparation program records and student outcome data under clearly articulated governance and privacy protocols (Washington state could act as an exemplar for this particular effort). These pilots would generate practical lessons to inform broader scaling efforts.

Long-term actions (5–10 years)

In the long run, we should think longitudinally and sustainably. Central to this phase is the development of a secure, persistent national teacher identifier that enables longitudinal tracking across states while preserving individual privacy and state control over data access. Over time, the system should enable near-real-time data exchange, allowing policymakers and researchers to monitor workforce trends, evaluate policy interventions, and anticipate emerging shortages.

Long-term efforts should also focus on governance and accountability. This includes establishing a permanent intergovernmental body responsible for overseeing data standards, access policies, and system maintenance, as well as embedding continuous improvement processes informed by user feedback.



It will also be necessary to monitor school policy context as it changes over time to ensure that data systems are responsive to changes in legal frameworks (e.g., teacher qualification mandates) and enrollment patterns (e.g., if enrollment shifts between school sectors). Finally, sustained investment is essential to ensure system upkeep, data quality assurance, and workforce training for state and district personnel responsible for data management and use.

Potential Stakeholders and Partnerships

Building a national teacher workforce data system requires collaboration among a diverse set of stakeholders. At the federal level, the U.S. Department of Education and the National Center for Education Statistics (NCES) play a critical convening and standard-setting role. State education agencies are essential partners, given their authority over licensure, data collection, and longitudinal data systems. Districts, as the primary employers of teachers, are key data producers and must be supported to modernize and align their human resources systems. Institutions of higher education and educator preparation programs are vital partners for linking workforce data to preparation pathways and program improvement. Research organizations and universities can contribute methodological expertise, evaluation capacity, and independent analysis to ensure the system supports rigorous and policy-relevant research. Finally, partnerships with nonprofit organizations, philanthropic foundations, and technology providers can support innovation, fund pilot efforts, and advance interoperability solutions. When grounded in shared goals of equity, transparency, and data stewardship, these partnerships can help transform fragmented data systems into a coordinated national infrastructure that supports a stable, well-prepared, and equitably distributed teacher workforce.



Conclusion

We provide a framework for thinking about teacher supply data, and our national scan applies that framework. This scan reveals a fragmented landscape of teacher workforce data systems, with substantial variation in infrastructure, data availability, and definitions. This is true even as many states maintain active state longitudinal data systems. Arguably key data for understanding teacher shortages, such as on teacher vacancies, is particularly rare. Even more common data, such as on teacher qualifications, are not always publicly available. When data are available, they are often reported at relatively high levels of aggregation (e.g., the state level), limiting their usefulness for policymaking, district planning, and research. Exemplar states demonstrate that stronger teacher workforce data systems are achievable, but exceptional data systems are the exception rather than the norm and data inconsistencies make comparisons between even exemplar states difficult.

For state policymakers and education agency leaders, this scan underscores the importance of investing in data infrastructure that goes beyond minimal federal reporting requirements. States seeking to address teacher shortages effectively need timely, granular data on vacancies, turnover, and qualifications disaggregated by district, school, subject, or even classroom level. Such data enable targeted interventions and more rigorous accountability, rather than broad policies that may not help the schools and students most affected by staffing challenges. Policymakers should also prioritize adopting common definitions for key workforce metrics to facilitate internal tracking and cross-state learning. Researchers can play a valuable role in partnering with states to build data capacity and to translate teacher workforce data into actionable insights. At the same time, district leaders and other education stakeholders should not assume that absence of data indicates absence of problems. The most severe staffing challenges may be obscured because data is aggregated at too high a level or because data systems are weakest precisely where they are needed most.

We propose that in the short term, federal leadership could convene states to establish minimum standards for teacher workforce data collection and reporting, building on existing frameworks like the Common Education Data Standards, and addressing current gaps in data coverage (e.g., around vacancies and preparation pathways). Targeted federal grants could support states and districts, particularly those with limited technical capacity, in modernizing data systems and improving interoperability, though it may be worth also investigating why previous investments in state data systems have gone further in some states than others.

Over the longer term, the field should work toward developing secure mechanisms for tracking teacher mobility across state lines, enabling a more national picture of the teacher supply. This will require both technical infrastructure and legal know-how. Organizations like Craft Education, with expertise in cross-jurisdiction data integration and legal compliance, can contribute to both developing and maintaining these data systems.



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Tables

Table 1. Data collected and definition

Variable	Definition
SLDS	A binary indicator of whether a state has an active and operational state longitudinal data system
Dashboard	A binary indicator of whether a state has an active and operational dashboard for viewing and interacting with data.
Vacancy	A binary indicator of whether a state has a vacancy count or rate available
Vac_def	A binary indicator of whether “vacancy” is defined
Vac_level	A categorical variable of the level of vacancy reported (e.g., state, district, school)
Vac_bysubj	A categorical indicator of whether vacancy is reported by teacher subject area (e.g., STEM, SPED, elementary, etc.)
Turnover	A binary indicator of whether turnover count/rate is available
Turn_def	A binary indicator of whether “turnover” is defined (e.g., leaving, moving, switching, etc.)
Turn_level	A categorical variable of the level at which turnover is reported (e.g., state, district, school)
Turn_window	A categorical variable capturing the most recent period represented in available turnover data (e.g., “2023”)
Leave	A binary indicator of whether leaving count/rate is available
Leave_def	A binary indicator of whether “leaving” is defined (i.e., leave the profession or the data system)
Leave_level	A categorical variable of the level at which leaving is reported (e.g., state, district, school)
Switch	A binary indicator of whether switching count/rate is available
Switch_def	A binary indicator of whether “switching” is defined (i.e., switch schools within district, switch districts)



Variable	Definition
Switch_level	A categorical variable of the level at which switching is reported (e.g., state, district, school)
Underqual	A binary indicator of whether underqualification count/rate is available
Underqual_def	A binary indicator of whether “underqualification” is defined (e.g., lack of certification, provisional/emergency)
Under_level	A categorical variable of the level at which underqualification is reported (e.g., state, district, school).
Under_bysubj	A categorical variable of the subjects for which underqualification is reported (e.g.,STEM, SPED, elementary, etc.)
tch_demo	A binary indicator of whether teacher demographics are provided
tch_demo_level	A categorical variable of the level at which teacher demographics are reported (e.g., state, school, level).
tchenroll	A binary indicator of whether teacher enrollment in preparation programs is provided
tchcomplete	A binary indicator of whether teacher completion in preparation programs is provided
total_students	A binary indicator of whether student enrollment in schools is available.
salary	A binary indicator of whether teacher salary information is available.



Appendix

Appendix Table 1: Federal Teacher Workforce Data Collections

Data source	Variables	Frequency	Latest Year Available	Granularity
Common Core of Data	Student enrollment, teacher counts	Every year since 1986	2024-25	Public school- and district-level universes
Schools and Staffing Survey (SASS) and National Teacher and Principal Survey (NTPS)	Teacher demographics, certification, experience, and turnover	From 1988-2021, every few years	2020-21	Teacher level data that are state- and nationally representative with weights
Civil Rights Data Collection (CRDC)	Student enrollment, demographics, school climate and characteristics, teacher qualification	From 2000-2024, every 2-3 years	2020-21	School-level data, state-level data
Title II of Higher Education Act	Enrollment and completion numbers, subject areas, teacher preparation program characteristics and requirements	2010-2024, every year	2024	Institutional level



Thank You!

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