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# New Jersey's Teacher Workforce Landscape: 2024 Annual Report

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**HELDRICH CENTER**  
FOR WORKFORCE DEVELOPMENT



RUTGERS-NEW BRUNSWICK  
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# Executive Summary

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New Jersey is one of many states confronting concerns about having enough qualified teachers to adequately staff its public schools and meet the learning needs of all enrolled students. One way to begin to address these concerns is to uncover the nuances of the existing teacher workforce and pathways to the career by analyzing available data. By shining light on patterns of enrollment in educator preparation programs and degree completion, the number and type of teaching credentials earned, hiring into various teaching positions, and retention of teaching staff, it is possible to better understand the present and future needs in the state's K-12 workforce.

New Jersey's state government has accelerated efforts to identify labor market needs more clearly in the K-12 education sector. Legislators, through Chapter 394 of Public Law 2021 (P.L. 2021, c.394), established annual data collection and reporting on the teacher workforce in the state. This first Teacher Workforce Report provides analyses of the teacher workforce to understand teacher retention (who stays and who exits) by demographic subgroups and examine the pipeline of available teachers who could potentially fill vacant positions in schools. This report builds upon a preliminary landscape study that provided an overview of the educator workforce in the state, presenting the foundational annual series and introducing a case study analysis to tracing the outcomes of cohorts from educator preparation programs onwards with the data currently available. Overall, the series of data analyses are moving New Jersey toward a more comprehensive understanding of its K-12 public education workforce so that appropriate policy solutions can be developed by the state legislature, as is the intent of Chapter 394 of P.L. 2021. Investigating the extent and nature of labor market shortages in the K-12 education sector in New Jersey entails investigating both the current and near-term demands for personnel, as well as the pipeline of future educators.

Using data from the New Jersey Statewide Data System, this report finds that:

**The overall number of teachers in the state has remained relatively stable over the past 11 years.** Year-over-year changes in the number of teachers remained between  $\pm 1\%$ . In the 2022-23 academic year, there were around 118,000 full-time equivalent teachers.

**While some subject specialties saw their staff numbers increase, other fields experienced substantial declines.**

There was a 17% increase in the number of English Language Learner (ELL) instructors, but a 9% decrease in the number of world language instructors and 8% declines for both mathematics and science teachers.

**Over time, the reasons public school staff give for exiting their roles has changed, with fewer reported instances of leaving due to not being offered reemployment.** Retirements accounted for 20% to 30% of teacher exits from district employment across the study period. The proportion not being offered district reemployment declined from 25% to 15% of all reported exits.

**Demographic changes in the student population and teacher workforce have altered student-teacher ratios (STRs) by race/ethnicity.** A higher STR indicates more students per teacher, so guidelines recommend lower STRs. STRs for all non-white student groups have declined over time, but are still far higher than STRs for white students.

**Staffing increases are likely needed in ELL, computer science, and special education.** STRs for ELLs have increased despite staffing increases, indicating there are fewer teachers per student requiring ELL over time. Computer science STRs have declined slightly, but are still very high.

**The number of new provisional teacher certifications has declined substantially relative to the number of permanent exits from the teaching profession, suggesting looming staffing shortfalls.** In 2013–14, there were three provisional certifications per permanent exit; in 2022–23, the ratio was one to one.

**Of the 4,521 students who enrolled in postsecondary education with education declared as their major between 2013–14 and 2015–16, only 1,073 students ultimately became teachers by 2022–23.** Importantly, the percentage of males and Black students decreased at each milestone in the teacher workforce pipeline – completing an education degree, getting a teacher certification, and becoming a teacher.

# Introduction

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The U.S. economy and democratic government are premised on the active participation of an educated citizenry, and Americans invest in the nation's system of public schools as the fundamental driver of future growth. Americans rely on the vitally important role of classroom teachers and instructional support staff to promote the development of youth by providing environments in which students learn, grow, and flourish through engaging in their studies. Given this importance, teaching can be a personally rewarding experience as a career choice, particularly when teachers feel supported by administrative staff, parents, and local communities.

However, teachers face several steps on their way into the classroom that begin with selective admissions and extends through fulfilling rigorous academic requirements, working in unpaid clinical experiences, preparing portfolios to showcase their talents, and passing exams to obtain credentials – all rigorous standards that must be surmounted before the job search process can begin. In New Jersey, K–12 teachers must obtain teaching credentials in specific subject areas. Further, once a position has been obtained, the hiring school district must apply for the teacher to receive a two-year provisional certificate.<sup>1</sup> During that initial period, which is referred to as induction, new teachers complete a Provisional Teacher Program. While this is a mandatory requirement at the state level, each Provisional Teacher Program is administered by the hiring school district, which means that there is variation among them. Thus, new teachers may receive adequate professional support during their induction period, when they have full responsibility for educating their students while adapting to doing the administrative tasks that all teachers have as part of their jobs. In sum, there are numerous points along the journey to becoming a teacher where prospective and newly credentialed teachers decide that it is no longer a desired occupation, before any of the other reasons teachers may leave the profession once they are in the classroom.

Unfortunately, little is known about what influences prospective teachers' decisions to enter or remain in a teaching position, and what is known about those choices is only understood at the aggregate level. Although that has been the situation for a long time, the temporary closures of school buildings during the COVID-19 pandemic put some longstanding issues in public schooling under a spotlight. Chief among them is the concern that there is a shortage of teachers, particularly in certain subject areas or specializations, such as science, technology, engineering, and mathematics; English Language Learning (ELL) for non-native speakers; world languages; and special education.

New Jersey is one of many states confronting this issue, with perceived shortages confirmed by the National Center for Education Statistics (NCES) through nationally representative survey research. NCES' National Teacher and Principal Survey found that public schools either had difficulty filling positions or were unable to fill teaching vacancies in foreign languages (42%), special education (40%), physical sciences (37%), English-as-a-Second-Language/bilingual education (32%), biology/life sciences (31%), computer science (31%), and career and technical education (31%) (NCES, 2022a). These findings at the national level offer reference points but very little actionable information because data in the aggregate obscure likely differences in staffing challenges from state to state, and from one school district to another within a state's borders. Each state is challenged to uncover the nuances in its available data. By shining light on patterns of enrollment in educator preparation programs (EPPs) and degree completion, of the number and type of teaching credentials earned, of the hiring into various teaching positions, and of the retention of teaching staff, it is possible to begin to understand the employment situation in the K–12 workforce.

New Jersey has monitored its K–12 workforce in the aggregate and has made data on the outcomes of the state's EPPs transparent to the public since 2014 through annual performance reports. New Jersey also has received federal funding through the State Longitudinal Data System grant program to better integrate disparate data collections within the New

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<sup>1</sup> See <https://www.teachercertificationdegrees.com/certification/new-jersey/>

Jersey Department of Education (NJDOE), which began in 2019, as well as longstanding efforts to build out the New Jersey Statewide Data System (NJSDS), which links administrative records from other state agencies, including the Office of the Secretary of Higher Education, the Higher Education Student Assistance Authority, and the New Jersey Department of Labor and Workforce Development.

New Jersey's state government has accelerated efforts to identify labor market needs more clearly in the K-12 education sector, both through the legislative and executive branches. Legislators, through Chapter 394 of Public Law 2021 (P.L. 2021, c.394), established annual data collections and reports on the teacher workforce in the state. In 2022, Governor Phil Murphy established the Task Force on Public School Staff Shortages in New Jersey. That task force, operating under a tight timeline, had an immediate need for information to suggest ways of addressing the wide-ranging complexities and challenges associated with teacher shortages, inclusive of how to support teachers to improve retention, bolster recruitment and training, and utilize state-funded programs to address teacher shortages. The Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey supported the work of the task force by providing its members with data analysis from 2013-14 to 2020-21 depicting trends in outputs of the state's EPPs and the teaching certificates awarded along with trends in the hiring of new teachers and their retention levels into a second year of teaching. Those data summaries appear in a report issued by the task force with recommended actions within those three areas associated with teacher shortages (Task Force on Public School Staff Shortages in New Jersey, 2023). The Heldrich Center also has been performing contractual work for NJDOE to investigate and shed light on the subtleties within the bigger picture of the state's K-12 teacher workforce using NJSDS data.

This report builds upon those findings, establishing the foundational annual series and introducing a case study analysis to trace the outcomes of cohorts from EPP onwards with the data currently available. Overall, the series of data analyses is moving New Jersey closer to having a more comprehensive understanding of its K-12 public education workforce so that appropriate policy solutions can be developed by the state legislature, as is the intent of Chapter 394 of P.L. 2021. Investigating the extent to which there is a labor market shortage in the K-12 education sector in New Jersey entails investigating both the current and near-term demands for personnel as well as the strength of the pipeline supplying the future K-12 workforce.

This report first provides background information on the teacher workforce and prior efforts to study it. Next, the report provides a brief background on the prevalence of, and reasons for, K-12 teacher shortages based on literature. The third section discusses the rationale for the current report and its development, including the study methodology, data sources, and measures. In the fourth section, results are presented thematically to address: the state of the teacher workforce, teacher exits and projections, teacher supply and demand, and a case study on the pipeline of new teachers through EPPs. Finally, the report concludes by summarizing findings, noting limitations, and suggesting next steps.

# Background

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## Shortages of Teachers is Not a New Problem

While widespread concern about shortages in the teacher workforce might seem to be a relatively new issue, it is a historically persistent problem for public schooling. As noted by scholars at the Learning Policy Institute, school staffing issues have been documented at varying intervals over the past century. There were staffing difficulties in the mid-1930s during the Great Depression, shortages in math and science date back to the 1950s, and there has been a perennial shortage of special education teachers since the 1960s (Sutcher et al., 2019). In 1983, the highly influential report, *A Nation at Risk*, observed that “severe shortages of certain kinds of teachers exist: in the fields of mathematics, science, and foreign languages; and among specialists in education for the gifted and talented, language minority, and handicapped students” (Gardner, 1983). Struggles to fill classroom teaching positions continued to occur in the late 1990s (Darling-Hammond, 2010), and those challenges were reported again a decade later following the Great Recession (Bielberg & Kraft, 2022). More recently, researchers found shortages of qualified teachers in the areas of special education, mathematics, science, and bilingual and English language education (Heim, 2016) with particularly acute challenges to fill teaching positions in math, science, and special education (Ingersoll, 2006).

## Determining the Nature of Teacher Shortages at the State Level

Even though reports from policy institutes and NCES can help to understand the national landscape of the teacher workforce, these national averages of the shortfalls of qualified educators to fill vacancies in various subject areas are inadequate to inform policy solutions at the local level for three main reasons. First, unlike in other sectors, the labor market for teaching staff is highly localized and employment decisions are made within small geographic areas and often without regard for the resources and needs that exist in nearby localities (Saenz-Armstrong, 2021). Second, there is variation in how the term “teacher shortage” is defined. More narrowly, it is construed as teacher production in relation to teacher demand factors such as student-enrollment sizes and teacher retirements. A more robust definition finds that “teacher shortages emerge in different fields and locations when there is an imbalance between the number of teachers demanded and the number of qualified teachers willing to offer their services to fill those demanded positions” (Sutcher et al., 2019, p. 4). Third, difficulty in filling vacancies is a widely used indicator of a shortfall of available qualified teachers, but the factors underlying the difficulty are not explained and therefore difficult to address from a policy perspective.

All states must collect and submit data on new teacher production to comply with Title II of the Higher Education Act, yet 18 states choose not to publish the information they provide to the U.S. Department of Education (Saenz-Armstrong, 2021). Moreover, the data on teacher demand is similarly opaque and limited to numbers of teachers in the existing workforce and the existing vacancies, such that it enables describing shortages only in a generalized way. For instance, it can be unclear whether there were more openings than hires or if certain positions went unfilled in a school year. Scholars at the Learning Policy Institute describe the challenge of distinguishing between ideal demand and actual demand, with the former considering factors such as the desired student-teacher ratio (STR), the geographic distribution of teachers, and course requirements to determine how many teachers are needed each year, and the latter representing the need for teachers based on the number of teachers actually hired and employed (Sutcher et al., 2019).

Wide gaps in the information available to researchers impede capacity to conduct national studies and state-to-state comparisons examining supply and demand in the teacher workforce. An analysis of state reporting of teacher supply and demand data offers recommendations to inform teacher labor markets by publishing information that includes “both supply and demand information that is sufficiently disaggregated and connected” (Saenz-Armstrong, 2021, p. 2). In the meantime, identifying specific challenges and their magnitude must be determined by delving more deeply

into the data warehoused by state education agencies. Even in that context, though, states vary in the level of detail (meaning the specific data elements and valid response options) they collect within the broader guidelines set by federal reporting requirements, which then affects the capacity to assess what is happening in their state's labor market for K-12 educators.

## Issues Affecting Supply and Demand in Teacher Labor Markets

Since workplace conditions affect any labor market, it becomes crucial to examine the most salient factors that have influenced teacher retention over recent decades. This topic predominantly has been viewed through the lens of attrition, meaning that it has focused on why K-12 educators change their jobs or exit the profession entirely. Pre-retirement attrition is of particular concern. The main factors contributing to teacher turnover include insufficient compensation, lack of professional respect, and being overburdened with additional job responsibilities for which they did not receive adequate training or institutional supports to perform (Sutcher et al., 2019; Turner & Cohen, 2023). Importantly, these are mutually reinforcing factors; research shows that teachers who indicated that their salaries are too low for their heavy workloads also reported facing challenges from parents and supervisory staff (Evans et al., 2021). Although determining whether the job responsibilities are worth the salary earned is a matter of personal choice, what is commonly referred to as the teacher pay penalty is a universal phenomenon.

Teachers are paid less, in terms of weekly wages as well as by total compensation, than their college-educated peers who are not teachers, and that disparity in earnings has become worse over time (Allegretto, 2022). A recent study found that teachers earn 76.5 cents on the dollar compared to the earnings of college graduates in other professions (Will, 2022). Wage stagnation is a related issue in the teaching profession: inflation-adjusted teacher wages have stayed the same since 1990. Meanwhile, the inflation-adjusted cost of college education needed to earn teaching credentials has nearly doubled from 1990 to 2020 (Turner & Cohen, 2023). Despite laboring under the teacher pay penalty, it is not uncommon for teachers to expend personal funds to ensure their classrooms have adequate supplies.

Multiple stress factors contribute to a disincentive to being a classroom teacher (Evans et al., 2021). These include workload/hours, not feeling valued, students' behaviors, poor working conditions, and testing requirements. Safety concerns also add to teachers' stress because they are responsible for handling so much in dangerous situations, such as learning how to secure students during active shooter lockdown drills (Evans et al., 2021). Tellingly, researchers cited a 2019 poll by *Phi Delta Kappan* that found about half of a nationally representative sample of public school teachers indicated a desire to leave the profession and 55% reported that they "would not want their child to follow them into the profession" (Engledowl & Rutledge, 2020).

The clearest indicator of a supply-side issue in teacher labor markets is reduced output from EPPs nationwide, which has been declining consistently as a long-term trend (Carver-Thomas, 2022). The Pew Research Center reports that, despite increases in the overall numbers of college degrees, there has been a profound drop in the numbers of education degree earners, and that decline has become more marked over the decades. In 2019-20, 85,057 (4%) of bachelor's degrees conferred were in education, as compared to 8% of the total bachelor's degrees in 2000-01, and the comparatively much larger number (21%) in 1970-71 (Schaeffer, 2022). The large declines evident in those data, however, reflect educators' degrees earned through the traditional EPPs at institutions of higher education. Alternative certification programs provide pathways to certification and licensure for those who already have a bachelor's degree, even though the traditional programs enroll the majority of prospective teachers across the nation, and they have shown increasing enrollment levels from 2010 to 2018; yet alternate certification programs still accounted for less than 20% of the total EPP enrollments during that period (Partelow, 2019).



## Examining Connections Between Teacher Preparation and Entering/Staying in the Public K–12 Workforce

Several studies mention the importance of being able to delve into the connections between teacher preparation and the likelihood of entering the teaching profession and remaining there (Bielberg & Kraft, 2023; Engledowl & Rutledge, 2020; Partelow, 2019; Sutcher et al., 2019). Highly localized teaching labor markets make it challenging for prospective teachers and those advising them to know which types of positions the schools in their geographic area are likely to be hiring in the near future, which can result in the overproduction of certain types of teaching credentials and not enough credentials being earned for subjects that are in greater demand. The mobility of new teachers also bears further consideration, whether that occurs within a state's borders or when they encounter barriers while attempting to cross state lines during their careers (Sutcher et al., 2019). Examining what happens with teacher candidates from preparation programs through the induction period is an important yet challenging feat in education research. However, one such study was conducted in Washington State using a database of over 15,000 teacher candidates from 15 EPPs to look at the connections between what candidates experienced in teacher preparation and the likelihood that they would enter and stay in the state's public teaching workforce (Goldhaber et al., 2021). Researchers examined the extent to which the alignment between the candidates' clinical experience during their EPP and their first job experience is predictive of teacher attrition. Although it was found that hiring rates fluctuated over time, those candidates who earned endorsements in hard-to-staff subjects like math and special education were more likely to enter the teaching workforce than other candidates. Further, teacher candidates who were hired into the same type of school (elementary, middle, or high school) or into schools with similar student demographics as their clinical experience were more likely to stay in the teaching workforce than candidates who had encountered less alignment between student teaching and initial employment (Goldhaber et al., 2021).

## Preparing for the Annual Teacher Workforce Report

A 2021 report from the National Council on Teacher Quality on state reporting of teacher supply and demand data observed that New Jersey follows three of the six key best practices for data availability (Saenz-Armstrong, 2021). Those key practices are producing new teacher supply data, teacher mobility data, and school-level aggregate teacher performance data. The best practices that New Jersey was reported as not following are producing new teacher demand data, disaggregated supply and demand data to the institution/district and certification level, and reporting on teacher shortages. Government actions taken at the executive and legislative branches have sought to remedy the findings reported by the National Council on Teacher Quality through the work of Governor Murphy's Task Force on Public School Staff Shortages in New Jersey and Chapter 394 of Public Law 2021.

In August 2023, the Heldrich Center used data shared with the New Jersey Statewide Data System (NJSDS), in conjunction with other data sources, to prepare a precursor report on the state's teacher workforce landscape. That report generated 19 findings related to three core components of the research: the teacher workforce landscape, teacher retention, and the teacher pipeline (Walsh et al., 2023). Among the key takeaways is that even though demographic shifts yielded an overall slight decrease in the STR from the 2013–14 to the 2020–21 school years, there were increases to the STR for certain subjects, namely in mathematics, science, and world languages. During that same period, New Jersey experienced significant declines in the numbers of teachers working in the profession across 10 subject areas. This coincided with a decline in the teaching endorsements issued by NJDOE in recent years across all subject areas. Yet teacher mobility, on average, has been consistent over that period, with about 9% of teachers moving to a different school district or exiting the public schools each year. Arguably, the most critical takeaway points to the need for more nuanced information on teacher vacancies and teacher exits to enable a better understanding of the dynamics of the current teaching workforce in the state. NJDOE already has acted upon recommendations to augment its staff data collection from school districts. But these new data collection protocols will take time to implement, and further time to analyze. Using the data currently at hand, Heldrich Center analysts have pursued a case study approach to take a deeper dive into New Jersey's pipeline of teachers.

# Methodology

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Heldrich Center analysts conducted descriptive analyses to provide an overview of trends and projections in New Jersey's teacher workforce using data extracts for the 2013–14 to 2022–23 school years. The primary data sources used for this study are NJDOE's New Jersey Standards Measurement and Resource for Teaching (NJ SMART) data system and other data contained in NJSDS,<sup>2</sup> which is New Jersey's centralized longitudinal platform for administrative data. Specifically, analysts used the Staff Member Identification (SMID) extract, which provides detailed information on staff members in each New Jersey Local Education Agency (LEA), certification and endorsement data that provide details on teachers' certifications, aggregate student-level data from NJ SMART, and postsecondary enrollment and completion data from the Office of the Secretary of Higher Education (OSHE).

Throughout this study, the staff and student data used are associated with all LEAs in New Jersey, including all types of operating school districts, non-operating school districts, limited-purpose regional school districts, county vocational-technical school districts, charter schools, and Renaissance schools. Additionally, the use of the term "teachers" refers to staff that have a State of New Jersey certification and spend at least a portion of their time assigned to an instructional job code as defined by NJDOE. Individual staff members may serve in up to six jobs within an LEA, so analysts defined teachers based on full-time equivalency (FTE) – the amount of time associated with an instructional job code. Please refer to the technical methodology in the appendix for additional information about the analysis.

Heldrich Center analysts assessed the changes in the teacher workforce in New Jersey by addressing four research questions about the teacher workforce in the state.

## Research Questions

1. What are the observed trends in New Jersey's teacher workforce, by the number (FTEs) of teachers, and by subgroups, including race, sex, age, and subject area?
2. What are the trends in and reasons for exiting the teacher workforce in New Jersey, by subgroups, including race, age, subject area, and job category?
3. What are the teacher workforce projections for various subject areas, and what subject areas are at higher-than-average risk of teacher turnover?
4. What are the trends and gaps in the workforce pipeline from postsecondary education, completion, and certification to entering the teacher workforce in New Jersey?

## Data Analysis

The Heldrich Center addressed these research questions through four main streams of analysis. Researchers first analyzed the current teacher workforce landscape, including by various subgroups over time – race, sex, age, and subject area. They also assessed the trends in and reasons for teacher exits by subgroups, including race/ethnicity and job categories. Analysts also used student, staff, and certificates and endorsement data to make projections of teacher workforce needs in New Jersey by subject area, including subject areas that are at risk of teacher shortages. Finally, to assess trends and gaps in the teacher workforce pipeline, analysts conducted a case study of individuals entering New Jersey postsecondary institutions from 2013–14 to 2015–16, observing their progress through three milestones in

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<sup>2</sup> NJSDS was formerly known as the New Jersey Education to Earnings Data System.

the teacher workforce pipeline: declaring and completing majors in education, obtaining teaching endorsements, and becoming teachers in New Jersey. Please refer to the technical methodology in the appendix for additional information about the analysis.

### ***Data Source: New Jersey Department of Education***

#### **NJ SMART Data**

To analyze the current teacher workforce landscape and pipeline, assess teacher exits by subgroups, and make projections, the Heldrich Center primarily used NJ SMART data, which are housed within NJSDS and cover the 2013–14 to 2022–23 school years. For each year, teachers were defined using the unique SMID within these data files and were limited to those who held certified teaching positions within the LEA for at least a portion of their time. Full-time administrators, certificated non-teaching positions, and non-certificated staff were not included in this analysis. This analysis developed measures of teacher exit (left the teaching profession), as well as measures of the propensity of current teaching staffing levels to “adequately meet teaching needs” – STR, and to be at a “higher-than-average risk” of teacher turnover or program elimination. Analyzing these data enabled analysts to identify trends by subject and other select characteristics, such as race and ethnicity, gender, and age groups, over time. Please refer to the technical methodology in the appendix for additional information.

#### **Certification and Endorsement Data**

Researchers analyzed state teaching certification and endorsement data between 2010 and 2022. Individuals pursuing teaching certifications must fulfill an endorsement that identifies the type(s) of subject area(s) they can teach. Since endorsements can be conferred by NJDOE at any time, all types of endorsements conferred are reported by calendar year. Because individuals may receive multiple endorsements, figures and analysis related to endorsements should not be interpreted as the number of new teachers or newly endorsed teachers, but instead as the number of those that have received the credential that year. However, analysts have included provisional endorsement by subject area as a proxy for first-time endorsements of new teachers in New Jersey. This facilitates projections and comparison with teacher exits over time and gives an idea of areas likely to be at risk.

### ***Data Source: Office of the Secretary of Higher Education***

To analyze the teacher workforce pipeline, the research team used enrollment and completions data from OSHE within NJSDS to examine students seeking bachelor's degrees at postsecondary institutions in New Jersey between the years 2013–14 and 2020–21. Selecting this period provided sufficient time – at least six years – for the 2015–16 student cohort to graduate and potentially enter the teaching workforce. Analysts identified and tracked the outcomes of students who follow more traditional education pathways – who enroll for a bachelor's degree in education, complete a bachelor's degree in education, and go on to become teachers. For this analysis, students who declare other majors but obtain a bachelor's degree in education or those students who obtain a bachelor's degree in other subject areas but also obtain a master's degree in education are not the focus. In addition, due to the limitations of OSHE data, this analysis excludes students following other nontraditional pathways. Please refer to the technical methodology in the appendix for additional information.

## Analytical Limitations

Apart from some of the limitations already highlighted, the analysis was confined to state estimates, which may overlook local- and/or school-level trends. By complying with data security and confidentiality requirements associated with NJSDS data use standards, analysts also combined and/or suppressed categories with few records, constraining the depth of the analysis. These practices, while essential for data security and confidentiality requirements, limit the scope of this analysis. Finally, it is important to note that longitudinal data require consistent tracking over time. Any interruptions or inconsistencies in the data collection may affect the analysis, so caution should be exercised in interpreting the results in areas where these inconsistencies may be present. For additional information, please refer to the technical methodology in the appendix.

# Results

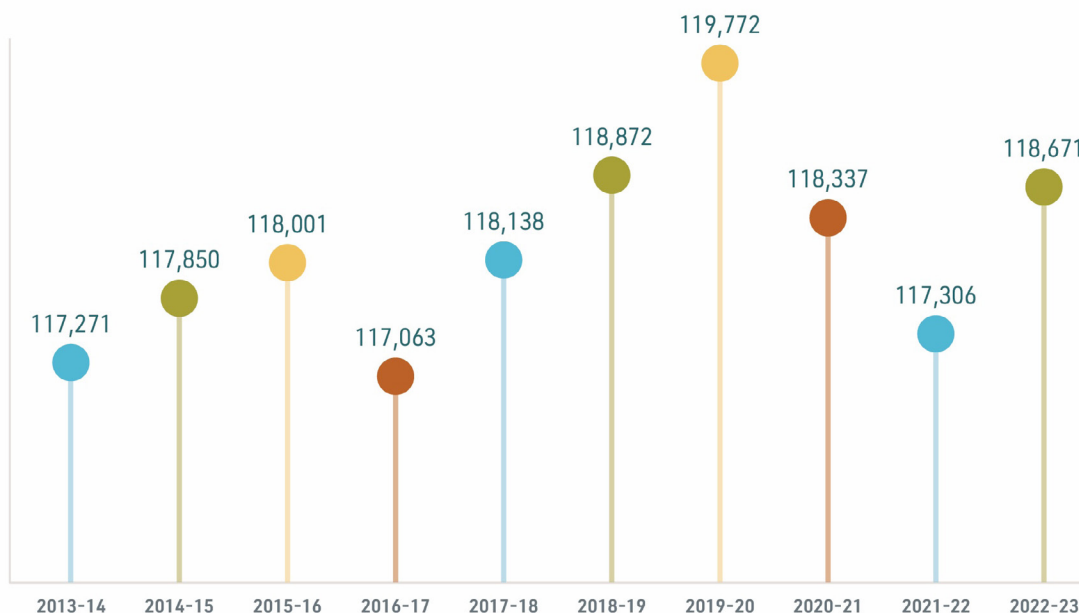
The first section below describes the results of the analyses, which attend to the four primary research questions stated above. The analysis first examines the state of the teacher workforce in New Jersey in terms of the number of teachers overall, then separately by gender, race/ethnicity, age, and subject area specialization. The following section examines trends in teacher exits over time, first focusing on the demographics and subject specializations of exiting teachers, then projecting workforce needs based on STRs. The final section includes a case study of the teacher pipeline by examining New Jersey college students' pathways through education degree programs, certification, and entry into teaching positions.

## The Teacher Workforce in New Jersey

The Heldrich Center conducted a descriptive review of the teacher workforce in New Jersey between the 2013-14 and 2022-23 school years. The descriptive review included an overview of the number of teachers each year by individual characteristics and by subject area. Individual characteristics, including race/ethnicity, sex, and age, are discussed below.

**Overall, the number of teachers in the state has remained relatively stable in the 11 school years reviewed for this analysis.** Change year over year remained between  $\pm 1\%$ . In the 2022-23 academic year, there were approximately 118,000 FTE teachers. Figure 1 shows these changes over time, ranging from 117,271 FTE teachers in 2013-14 to 118,671 in 2022-23. The peak occurred in the 2019-20 school year, with 119,772 FTE teachers.

Figure 1: Number (FTEs) of Teachers in New Jersey



Note: The teacher FTEs were calculated by summing the FTE proportion for active staff with job codes between 1000 and 2799 (see Table A-1) for each staff member in each year. Staff members with a total FTE greater than 2 and those who were inactive in a particular academic year were excluded from the analysis. Researchers define teachers broadly using this job code range, including code 2401: supplementary instruction (pull out); code 2406: resource program (pull out); codes 2410 to 2412 for teach coach coordinator leader; and codes 2501 to 2799 for vocational education. Given nuances to these definitions, the total FTEs for teachers each year may vary slightly from the total FTEs reported elsewhere depending on how they define class teachers and if their definition excludes some of the job categories as stated above.

Source: NJ SMART Submission Data

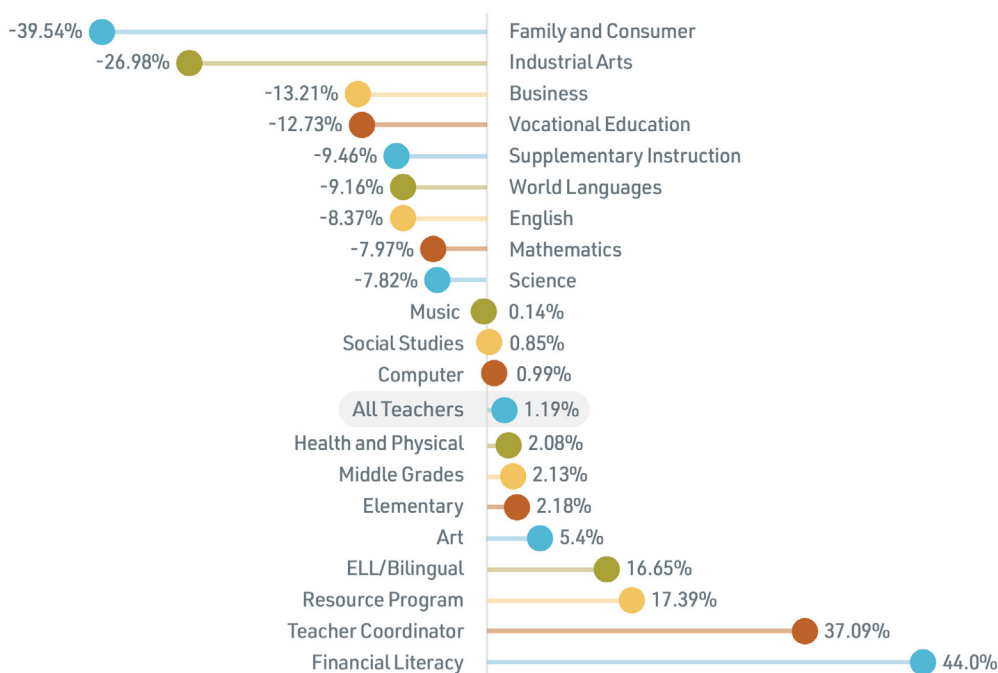
**When reviewing the trends by subject area, some areas have seen more significant changes than others.** For instance, there has been a 17% increase in ELL teachers from 2013–14 to 2022–23 (an increase of around 400 teacher FTEs, as shown in Figure 2). Figure 3 shows that there was modest growth of 2% during that same period for elementary and middle school teachers. Computer science only saw a 1% increase during this period. Some critical fields, however, saw large declines. World languages had a 9% decrease (around 400 FTE teachers), and mathematics and science each had an 8% decrease (around 500 and 400 FTE teachers, respectively).

Figure 2: Number (FTEs) of Teachers in New Jersey by Subject Area and Year

	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
All Teachers	117,271	117,850	118,001	117,063	118,138	118,872	119,772	118,337	117,306	118,671
Art	3,257	3,291	3,295	3,292	3,320	3,337	3,390	3,344	3,353	3,433
Business	1,045	1,047	1,020	993	988	952	948	952	925	907
Computer	908	855	890	931	943	930	946	946	940	917
Elementary	41,911	42,167	41,745	41,192	41,914	42,430	42,717	42,520	42,055	42,823
ELL/Bilingual	2,630	2,615	2,369	2,425	2,542	2,630	2,733	2,800	2,862	3,068
English	6,867	6,786	6,741	6,717	6,700	6,657	6,571	6,374	6,296	6,292
Family and Consumer	607	566	531	495	469	453	452	411	383	367
Financial Literacy	100	114	107	119	116	125	129	128	115	144
Health and Physical	7,008	7,058	7,029	6,981	7,041	7,108	7,168	7,086	7,031	7,154
Industrial Arts	1,123	1,133	1,074	990	957	937	890	838	807	820
Mathematics	6,412	6,367	6,342	6,313	6,264	6,273	6,212	6,057	5,971	5,901
Middle Grades	11,490	11,866	12,300	12,333	12,334	12,234	12,376	12,084	11,927	11,735
Music	3,553	3,558	3,565	3,519	3,590	3,609	3,622	3,559	3,517	3,558
Resource Program	12,459	13,082	13,629	13,989	14,176	14,237	14,595	14,476	14,582	14,626
Science	4,834	4,825	4,813	4,738	4,737	4,688	4,712	4,596	4,494	4,456
Social Studies	4,335	4,359	4,345	4,295	4,310	4,322	4,344	4,291	4,275	4,372
Supplementary Instruction	3,129	2,920	2,890	2,567	2,564	2,651	2,677	2,738	2,633	2,833
Teacher Coordinator	709	697	812	757	778	849	872	831	857	972
Vocational Education	1,611	1,289	1,274	1,269	1,296	1,339	1,372	1,375	1,391	1,406
World Languages	4,190	4,111	4,119	4,082	4,044	4,041	3,994	3,876	3,830	3,806

Source: NJ SMART Submission Data

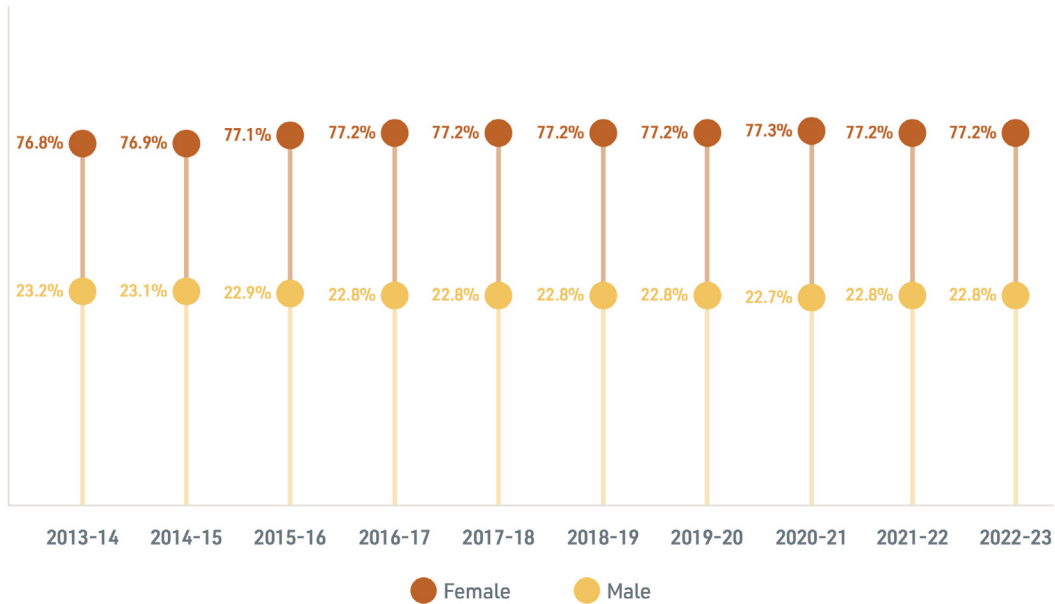
Figure 3: Percent Change in Number of Teachers by Subject Area, 2013–14 to 2022–23



Source: NJ SMART Submission Data

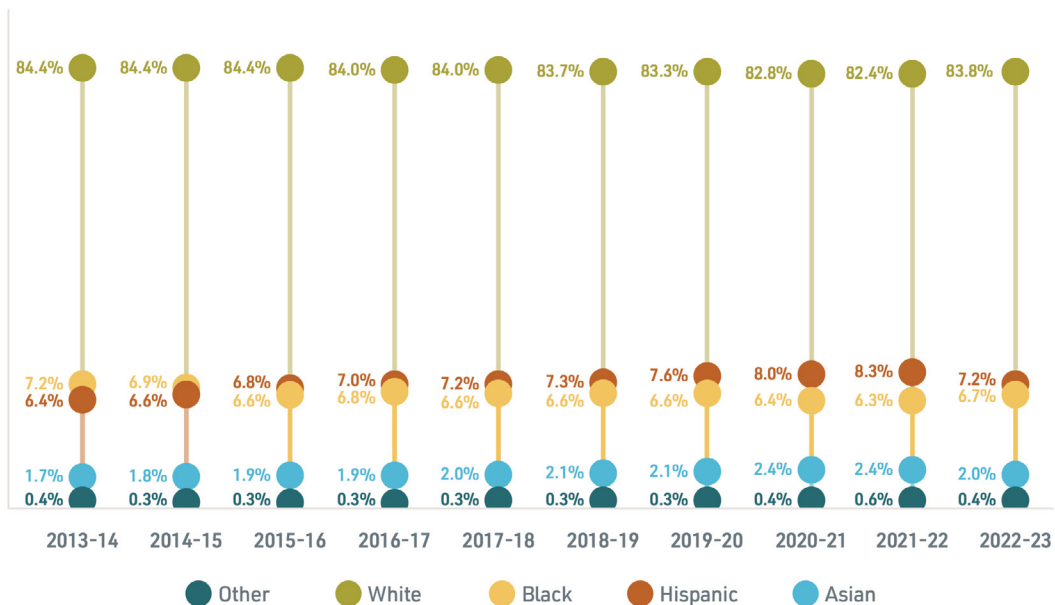
**Most teachers in New Jersey are white and/or female, and this has changed little over time.** During the study period, between 76% and 77% of the teacher workforce was female, and between 82% and 84% were white, as shown in Figures 4 and 5. Overall, the proportion of Hispanic teachers increased between 2013–14 and 2022–23 (30%, or around 2,000 teachers).<sup>3</sup> However, there was a slight decline in the proportion of Hispanic teachers between 2021–22 and 2022–23. In addition, the number of Black teachers declined substantially between 2013–14 and 2022–23 (-10% or a loss of around 900 teachers).

Figure 4: Proportion of Teachers by Sex



Source: NJ SMART Submission Data

Figure 5: Proportion of Teachers by Race/Ethnicity



Source: NJ SMART Submission Data

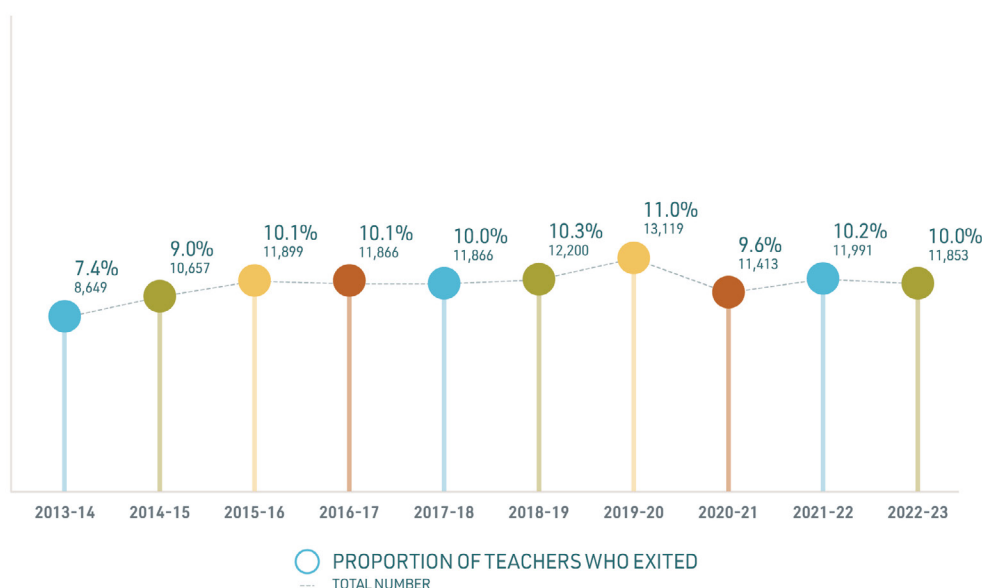
<sup>3</sup> Teachers here refers to the count of teachers and not their FTEs.

**When reviewing the teacher workforce by age category, there has been a decrease in the share of teachers age 39 or younger, and an increase of those age 40 or older.** In the earlier years of this analysis, the split was around 43% age 39 or younger and 57% age 40 or older. In recent years, however, this has changed; the age 39 or younger group now comprises around 38% of the workforce. Another way of examining teacher age is tracking the median value over time. By this metric, the median age of teachers remains relatively constant at age 47 during this period.

## Teacher Exits

**The number of public school exits has increased slightly over time.** In the first year of the analysis (2013-14), the number of teacher exits was around 8,700 (see Figure 6). Since then, the number of exits per year has increased but remained stable at approximately 12,000 per year. As a share of the annual teacher workforce, the number of exits has remained constant between 9% and 11% since the first year of the study period when it was 7%.

Figure 6: Total and Proportion of Teacher Exits by School Year



Source: NJ SMART Submission Data

**Over time, the reasons public school staff provide for exiting their roles changed, with fewer reported instances of leaving due to not being offered reemployment.** Throughout the study period, the most commonly reported reasons for exiting teaching were retirement and not being offered reemployment (see Table 1). While the proportion of exits attributed to retirement has remained relatively constant (between 24% and 28%), the proportion reporting no offer of reemployment has decreased from approximately 25% to 21% and declined substantially to 15.3% in the most recent school year. The proportion of exiting teachers who indicated leaving the profession altogether has varied slightly between 1% and 2% over the study period. The figures for the 2022-23 school year seem to deviate from the observed trends; a notably higher proportion are listed as “no reason given for resignation.”<sup>4</sup>

<sup>4</sup> Based on communication with NJDOE staff, this discrepancy may be due to changes in data collection in the 2022-23 school year.



Among the categories of teacher exit reasons, three are the focus – retirement, left teaching, and death – as permanent exits from the teacher workforce. Permanent exits have ebbed and flowed as a proportion of total exits, from between 20% and 30% of all teacher exits in a given year. Permanent exits are discussed again later in the report.

**Table 1: Teacher Reported Exit Reasons**

	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
<b>Left District, Still Teaching</b>										
In another New Jersey public school	13.1%	13.4%	13.4%	12.7%	13.6%	15.3%	15.2%	12.8%	15.1%	17.9%
In a public school district outside New Jersey	1.8%	1.9%	2.3%	2.1%	2.1%	2.4%	2.2%	1.7%	1.9%	1.9%
In a non-public school	0.9%	0.8%	1.0%	0.6%	0.9%	1.0%	1.1%	0.9%	0.9%	0.9%
In a college/university	S	S	S	S	S	S	S	S	S	0.1%
<b>On Leave Without Pay</b>										
Granted leave/sabbatical	1.7%	2.6%	2.0%	1.9%	1.4%	1.5%	1.2%	1.8%	1.6%	1.1%
Maternity leave	6.4%	7.0%	5.3%	4.9%	4.4%	4.2%	3.3%	3.7%	2.8%	2.4%
<b>Exited Teaching</b>										
Retired	26.0%	28.2%	27.9%	26.7%	25.6%	24.6%	24.1%	27.1%	27.2%	21.8%
Left teaching	1.2%	1.4%	1.8%	1.4%	1.9%	1.7%	2.1%	2.3%	1.5%	1.7%
<b>Changed Life Circumstances</b>										
Continuing education	0.4%	0.3%	0.4%	0.5%	0.4%	0.3%	0.3%	0.3%	0.3%	0.2%
Assumed home duties	1.9%	2.1%	2.1%	2.2%	2.1%	2.1%	1.6%	1.8%	2.3%	2.0%
Prolonged illness	0.3%	0.3%	0.4%	0.3%	0.4%	0.4%	0.4%	0.3%	0.3%	0.4%
Deceased	0.5%	0.6%	0.5%	0.5%	0.4%	0.5%	0.5%	0.5%	0.7%	0.5%
<b>Other Exit Categories</b>										
Resigned, no reason given	20.6%	19.1%	20.0%	21.0%	21.6%	22.4%	23.6%	22.1%	24.4%	32.5%
Exited or resigned for another reason	S	S	S	S	S	S	S	S	S	1.3%
Not offered reemployment	25.1%	22.3%	22.9%	25.0%	25.1%	23.6%	24.5%	24.5%	20.9%	15.3%

Note: "S" indicates that the data were suppressed.

Source: NJ SMART Submission Data

**When reviewing teacher exits by individual characteristics such as race/ethnicity and sex, the most striking change is the proportion of exits by race/ethnicity.** When examining the demographic traits – race/ethnicity and sex – of exiting teachers, it is useful to compare these figures to the traits of the teacher workforce overall. For example, as noted above, New Jersey’s teacher workforce remained approximately 84% white throughout the study period. When examining exits across the study period, there is a proportional decline in exits among white teachers from 86% to 80%. This decline, shown in Table 2, is accompanied by increases in the proportion of exits among Black (+1.7%), Hispanic (+1.4%), and Asian teachers (+0.8%). Hispanic and Asian teachers have increased in their share of the teacher workforce, which explains their increase in the share of exits. But exits among Black teachers have increased while their numbers in the teacher workforce have declined. Effectively, this means that there are fewer Black teachers in New Jersey’s workforce as those who leave are not being replaced. This point is revisited later in the discussion of STRs.

Exits by staff sex have remained consistent, with females accounting for between 78% and 79% of exits each year. This is consistent with the overall workforce composition, of which around 77% is female.

**Table 2: Teacher Exits by Teacher Race/Ethnicity and Sex**

	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
White	85.7%	85.2%	85.1%	83.8%	82.9%	83.1%	81.3%	82.8%	81.7%	79.7%
Black	6.0%	6.5%	5.9%	6.7%	7.0%	6.8%	7.8%	7.4%	7.7%	8.3%
Hispanic, any Race	6.2%	6.1%	6.7%	6.9%	7.5%	7.3%	7.9%	6.8%	7.6%	8.5%
Asian	1.7%	1.8%	1.9%	2.2%	2.2%	2.4%	2.4%	2.5%	2.5%	2.9%
Other Race	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.2%	0.3%
Multiple Races Indicated	0.1%	0.2%	0.2%	0.1%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%
Female	78.3%	79.2%	78.4%	78.9%	78.3%	78.4%	78.2%	78.6%	78.3%	78.5%
Male	21.7%	20.8%	21.6%	21.2%	21.7%	21.6%	21.8%	21.4%	21.8%	21.5%

Source: NJ SMART Submission Data

**Teacher exits by subject area remained relatively constant over time.** Trends in teacher exits by subject area were also reviewed. Roughly one-third of exits each year were by elementary school teachers, though this has increased by about three percentage points over the period. Another 10% to 11% of exits were by middle school teachers, which has stayed relatively consistent over time (see Table 3). Support and resource instructors, who typically work in special education programs, constituted 15% to 16% of exits across the study period. The proportion of exits by mathematics teachers declined over the study period from 6% to 4.5%. Declines in the proportion of teacher exits were also observed in English (-1.4 percentage points), foreign languages (-1.3 percentage points), and science (-0.6 percentage points).

**Table 3: Teacher Exits by Subject Area**

	2013– 14	2014– 15	2015– 16	2016– 17	2017– 18	2018– 19	2019– 20	2020– 21	2021– 22	2022– 23
Elementary Teachers	32.69%	33.74%	33.5%	33.29%	32.66%	33.56%	34.19%	34.98%	35.36%	35.98%
Support and Resource	15.37%	14.88%	15.67%	15.06%	16.12%	16.46%	15.89%	16.39%	16.28%	15.54%
Middle School	10.28%	10.58%	10.55%	10.69%	10.13%	9.51%	9.57%	9.61%	8.71%	9.82%
English	9.25%	8.78%	8.35%	8.71%	8.05	7.84%	7.84%	7.84%	8.36%	7.82%
Math	5.86%	5.1%	5.4%	5.22%	5.42%	5.21%	5.2%	4.68%	4.76%	4.55%
Foreign Languages	4.93%	4.95%	4.58%	4.68%	4.39%	4.34%	4.66%	4.2%	3.93%	3.61%
Science	4.81%	4.27%	4.25%	4.47%	4.86%	4.66%	4.21%	4.12%	3.97%	4.23%
Health/Physical Education	4.54%	4.84%	4.93%	4.83%	4.74%	4.93%	5.29%	5.22%	5.51%	5.02%
Social Studies	3.13%	3.06%	3.14%	2.71%	3.21%	2.78%	3.01%	2.66%	3.09%	3%
Music	2.89%	3.42%	3.45%	3.8%	3.67%	3.94%	3.69%	3.67%	3.49%	3.76%
Industrial Arts & Vocational Education	2.37%	2.19%	2.04%	2.18%	1.95%	2.2%	1.99%	1.98%	1.96%	2.05%
Art	2.16%	2.5%	2.34%	2.71%	3.12%	3.11%	3.08%	3.06%	3.14%	3.34%
Family & Consumer Science/Finance	0.87%	0.76%	0.87%	0.83%	0.78%	0.69%	0.54%	0.71%	0.64%	0.55%
Business	0.86%	0.93%	0.92%	0.83%	0.89%	0.79%	0.85%	0.88%	0.8%	0.73%

Source: NJ SMART Submission Data

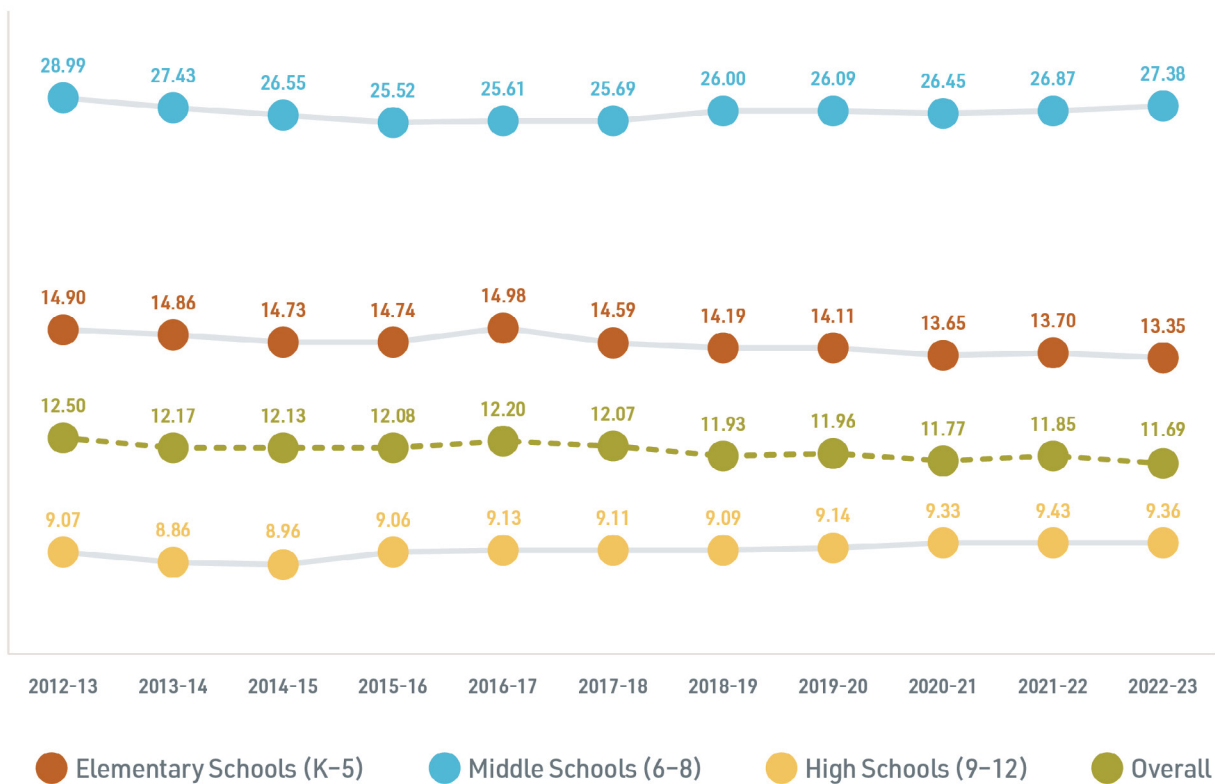
## Workforce Projections and High Turnover Areas

To begin to project the future needs of New Jersey's teacher workforce, analysts first calculated STRs – both overall and within grade level, demographic, and subject area subgroups – across the nine years for which student unit data were available (2012–13 through 2020–21). In these STR calculations, student head counts are the numerator, and teacher FTEs are the denominator. STRs are reported as the number of students overall or within a specific subgroup per one FTE teacher.

For the two most recent school years in which student data were not available, analysts extrapolated from the available data to predict student enrollment, and thus estimate the STR. The analysis of these statistics has two elements. First, examining the trends in STRs provides the ability to see whether and in what groups additional teachers are needed. Second, comparing these (real and projected) STRs to national and state benchmarks helps determine if staffing levels are adequate.

**Overall STRs have declined slightly, primarily due to changes at the elementary school level.** In terms of the statewide STR, Figure 7 shows a modest decrease in the number of students per teacher FTE in New Jersey's public school system, from 12.5 students per teacher in 2012–13 to 11.8 students per teacher in 2020–21; the projections indicate only slight declines in student enrollment, which do not meaningfully change the STR. When analysts examined STR trends categorized for elementary school (K–5), middle school (6–8), and high school (9–12), a more nuanced picture emerged. The decline in overall STR appears to be driven by more significant declines at the elementary and middle school levels. The STR for New Jersey's elementary schools dropped from 14.9 in 2012–13 to 13.7 in 2020–21; Heldrich Center analysts' projections for the next two years indicate a further decline in student head count, which would further reduce the STR. Importantly, the observed STRs for New Jersey elementary schools are consistently below both the national average (15.0) and the benchmark implied in state guidance (14.7) (New Jersey Department of Education, 2007).

Figure 7: Student-Teacher Ratios, Overall by Grade Level



Source: NJ SMART Submission Data

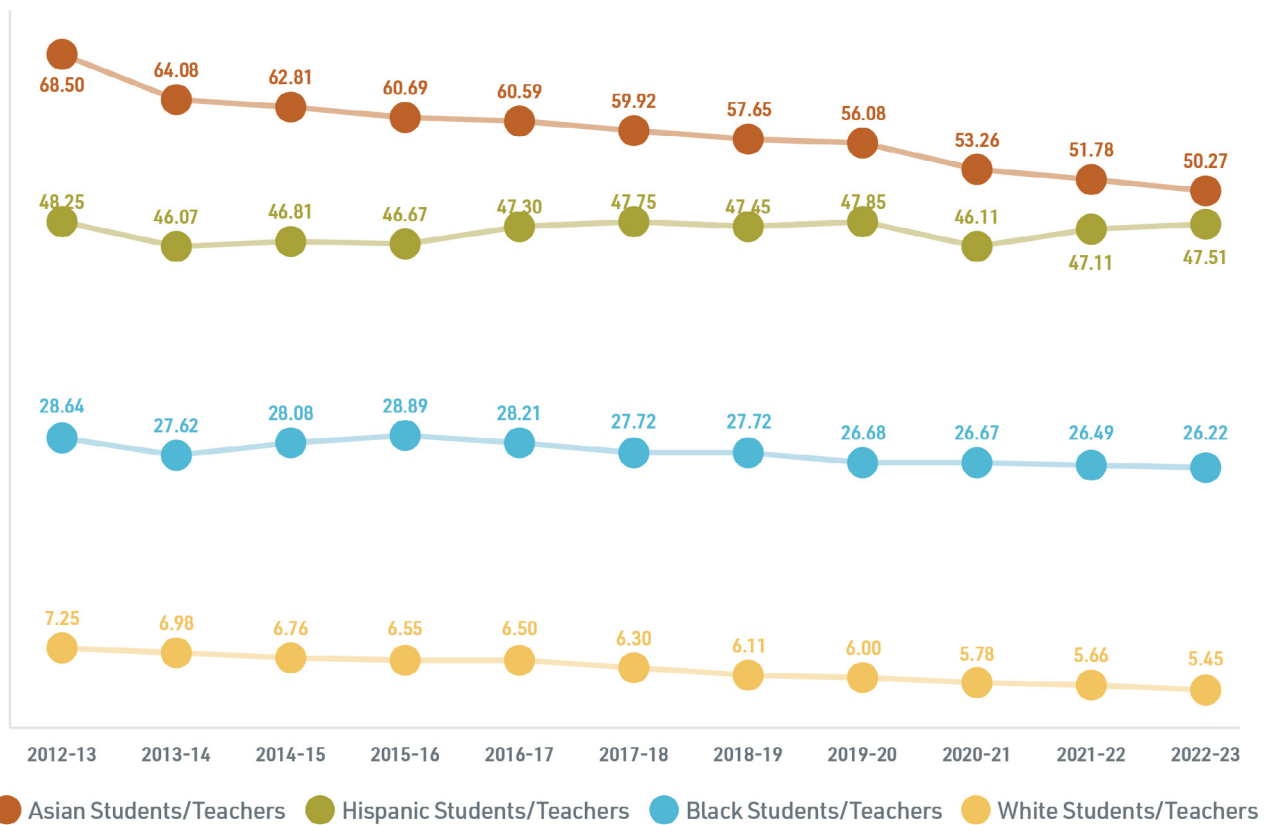
At the middle school level, the decrease in STR was more substantial, going from 29.0 in 2012–13 to 26.5 in 2020–21. This decrease appears to be due to pronounced increases in middle school FTEs over this period. Analysts' projections indicated that the middle school STR will have increased slightly by 2022–23 due to declining FTEs. Notably, the observed STRs for New Jersey middle schools are substantially higher than both the national average (15.2) and the benchmark implied in state guidance (14.0). This difference may be due to how analysts estimated middle school FTEs.

At the high school level, the STR has remained relatively constant over time, hovering between 8.9 and 9.3 between 2012–13 and 2020–21. Projections into 2022–23 indicate that the high school STR will remain relatively unchanged. The observed STRs for New Jersey high schools are substantially lower than both the national average (15.4) and the benchmark implied in state guidance (12.8).

**Demographic changes in the student population and teacher workforce have altered STRs by race/ethnicity.** Heldrich Center analysts noted that while the proportion of white teachers remained relatively constant over the study period, the proportion of Hispanic teachers slightly increased, and the proportion of Black teachers declined. Here, by focusing on the STR, analysts examined the changes in the teacher workforce as they related to demographic changes in New Jersey's student population. This analysis of the STRs compared student head count by race/ethnicity to the number of teachers of the same race/ethnicity. Figure 8 shows that the STR for white students and teachers declined by 25%, from 7.3 students per teacher in 2012-13 to 5.8 students per teacher in 2020-21; this decline is projected to continue to 5.5 students per teacher in 2022-23. The resulting trend is driven by a relatively static number of white teachers combined with a marked decline in the number of white students.

The STRs for same race/ethnicity of Black and Hispanic students and teachers both declined slightly, but for different reasons. The number of both Black students and teachers declined during the study period, but the relative decline in students has been more substantial. The number of both Hispanic students and teachers increased markedly over the study period, but the relative increase in the number of Hispanic teachers has outpaced the growth in students. This same pattern is evident among Asian students and teachers. Notably, and in spite of the trends, STRs for all non-white groups are 5 to 10 times higher than the STRs among white students and teachers. Overall, these trends in STR by race and ethnicity indicate that New Jersey's teacher workforce is beginning to diversify to match its student body, but more work remains to be done to achieve that as a goal.<sup>5</sup>

**Figure 8: Student-Teacher Ratios by Shared Student and Teacher Race/Ethnicity**



Source: NJ SMART Submission Data

<sup>5</sup> Table A-1 in the appendix presents an alternate specification of this analysis in which the denominator in all STR calculations is the total number of students of all races.

**Staffing increases are likely needed in ELL, computer science, and special education.** Heldrich Center analysts examined STR trends in three specific subject areas – ELL, computer science, and special education. For computer science, they compared head count enrollment in high schools to the number of teacher FTEs in computer-related job codes.<sup>6</sup> For ELL, analysts compared the number of students classified as Limited English Proficiency (LEP) with the number of teacher FTEs in ELL job codes.<sup>7</sup> For special education, they compared the number of students classified as special education status to the number of teacher FTEs in resource and support programs.<sup>8</sup>

Over the study period, the STR for computer science declined from 469 students per teacher in 2012–13 to 459 students per teacher in 2020–21; projections indicate that it will have declined further to 455 in 2022–23 (see Table 4). The number of computer science FTEs varied over the study period from just under 900 to almost 950, while the number of high school students remained relatively constant. The average New Jersey high school enrolled approximately 907 students in 2021–22, suggesting there are approximately two teaching FTEs in computer positions per high school. If New Jersey's education system seeks to provide robust instruction in computer science, it will need to devote more FTEs to this subject area.

ELL STRs, by contrast, increased substantially over the study period. In 2012–13, the ELL STR was 25.9, and by 2020–21, it had grown to 34.2, a 32% increase (see Table 4). Projections indicate that this STR will have remained relatively consistent through 2022–23. The increased STRs are driven by rapid growth in the number of LEP students in the state, which has outpaced growth in the number of FTEs in this subject area. These trends suggest that hiring of ELL instructors will need to continue to ramp up to meet increasing demand as the state's LEP student population continues to grow.

**Table 4: Student-Teacher Ratios and Projections for Select Areas**

School Year	LEP Students to ELL Teacher FTEs	High School Students to Computer Teacher FTEs	Special Education Students to Resource Program FTEs
2012–13	25.9	469.5	18.2
2013–14	25.2	464.3	17.1
2014–15	27.8	494.2	17.0
2015–16	31.5	475.0	16.4
2016–17	31.5	454.0	16.1
2017–18	33.1	448.0	16.1
2018–19	33.4	454.8	16.2
2019–20	36.1	457.8	16.1
2020–21	34.2	458.7	15.8
2021–22 (projected)	35.0	451.2	15.8
2022–23 (projected)	34.1	455.0	15.8

Source: NJ SMART Submission Data

<sup>6</sup> Job codes in this field are 1962, 2525, 2593, 2712, and 2718.

<sup>7</sup> Job codes in this field are 1485 and 1486.

<sup>8</sup> Job codes for this field are 2405 and 2406.

In terms of special education, the observed STR declined noticeably over time – from 18.2 in 2012–13 to 15.8 in 2020–21 (see Table 4). Projected student numbers indicate that the STR will have remained constant through the current school year. Adequate STRs for special education depend on the specific needs of the student population, and as analysts note in the appendix, their calculated STRs are not directly comparable to class size. But in class size terms, 16 is at the upper bound of what is recommended by New Jersey state law (N.J. Admin. Code § 6A:14-1.2). This suggests that staffing of special education teachers likely needs to increase.

## Teacher Pipeline

Another way of projecting the sufficiency of the teacher workforce is to compare the rate of entry into the profession (inflow) to the rate of exit from the profession (outflow). Analysts define inflow as the number of provisional teaching certificates conferred in a given year; they define outflow as the number of teachers whose reason for exit was listed as “retirement,” “left teaching,” or “deceased.” Using provisional certifications as an indicator overestimates inflow; not everyone who earns a provisional teaching certification enters employment at a public school. As such, provisional certifications likely represent an upper-bound estimate of the potential replacement of exiting teachers. Outflow could be underestimated insofar as some teachers who leave or retire might not report their reason for leaving. From these inflow and outflow measures, analysts derive the rate of replacement as the number of new provisional certifications per exiting teacher.

Table 5 presents this statistic over time and reveals a concerning trend. While in the first four years (2013–14 through 2016–17), the rate of replacement was approximately three to one, this rate declined to approximately two to one in the next three years, and further declined to approximately one to one in the most recent three years. Considering that at least 10% of new teachers opt to leave the profession within their first three years (National Center for Education Statistics, 2022b), a one-to-one replacement rate would lead to broad teacher shortages within a short period of time. It also suggests the need for concerted teacher retention policies in addition to shoring up routes into the profession. The next section provides a more nuanced look at the supply of incoming teachers through the traditional certification pathway.

**Table 5: Flows Into and Out of Teaching**

	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Provisional Teaching Certifications	22,897	26,035	28,091	23,830	20,171	16,754	15,097	10,756	13,003	9,073
Permanent Exits	7,827	7,607	9,144	8,542	8,930	8,826	9,516	9,120	9,707	8,092
Provisional Certifications per Exiting Teacher	2.9	3.4	3.1	2.8	2.3	1.9	1.6	1.2	1.3	1.1

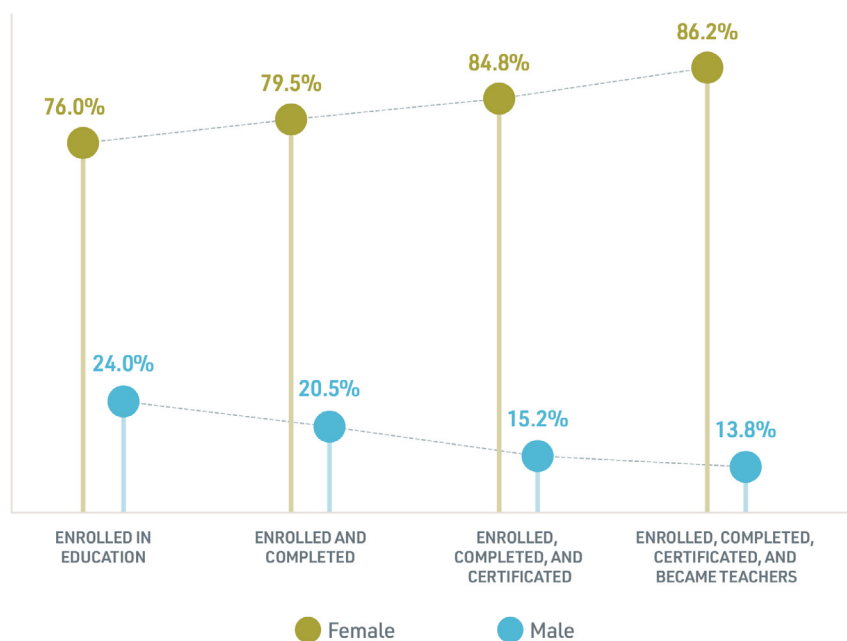
Source: NJ SMART Submission Data

## Case Study: Cohort of Prospective Teachers from 2013–15

**Of the 4,521 students who enrolled in postsecondary education with education declared as their major between 2013–14 and 2015–16, only 43% completed their degree with an education major.** Of these 4,521 students, 35% obtained an endorsement and 23% became teachers in New Jersey. Notably, the gaps within the teacher workforce pipeline are between postsecondary enrollment and completion as well as between getting certified and joining the teacher workforce. Of the 1,955 students who completed their major in education, 82% successfully obtained an endorsement. Considering that some students might move out of state, this proportion could be considered fair. However, of the 1,616 students who obtained an endorsement, only 66% eventually become teachers in New Jersey.

**The percentage of males and Black students decrease as their presence is observed throughout the teacher workforce pipeline.** Of students who enrolled in postsecondary education and declared education as their major between 2013–14 and 2015–16, about 24% were males (see Figure 9). However, of those who enrolled and declared a major in education, completed the degree program, became certificated, and became teachers, only 14% were males. In addition, 11% of students who enrolled in postsecondary education and declared education as their major between 2013–14 and 2015–16 were Black (see Figure 10). Of those who went on to become teachers, only about 4% were Black. Notably, the significant decrease for Black students in the pipeline occurs within the postsecondary education institutions.

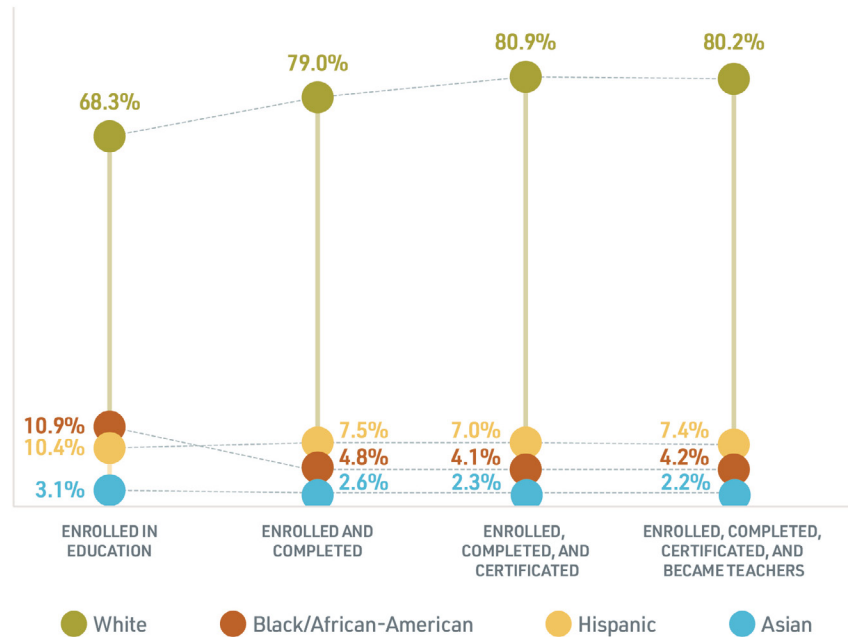
Figure 9: Cohort Analysis, by Sex



Source: NJ SMART Submission Data; OSHE Enrollments and Completions



Figure 10: Cohort Analysis, by Race/Ethnicity



Source: NJ SMART Submission Data; OSHE Enrollments and Completions

Note: Several other race/ethnicity categories, such as Pacific Islander, Native Hawaiian, Alaskan Native, American Indian, and those who did not specify their race/ethnicity were grouped as "other" due to low counts. This category is not included in this figure due to suppression rules since the group total comprised less than 1% of persons at each milestone in the teacher workforce pipeline.

These findings are similar for observations of each of the postsecondary cohorts individually (2013–14, 2014–15, and 2015–16) at each milestone in the teacher workforce pipeline. The proportion of Black students at each milestone of the pipeline remained similar for each individual cohort, highlighting challenges for this group of students within postsecondary education institutions. The proportion of white students at each milestone of the pipeline increased for each individual postsecondary cohort; on the other hand, the proportion of Hispanic students represented at each milestone in the teacher workforce pipeline continued to drop over time. Of those who became teachers, very few people exited the teaching profession during the period of analysis (2013–22). This is consistent with findings that teacher attrition is lesser among teachers who enter the teaching profession through traditional teaching pathways (Guthery & Bailes, 2022).

## Conclusion and Next Steps

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This inaugural report on New Jersey's K–12 teacher workforce presented a high-level descriptive analysis based on a decade of data for a key segment of the education labor market. Heldrich Center analysts sought to understand how the demographic traits of New Jersey's public school teachers changed over time, to assess trends in teacher exits, and to project teacher demand and supply into the future. The Heldrich Center analyzed NJSDS data, including information about teachers, teacher certifications, public school students, and college students pursuing education credentials. Their analyses yielded the following key findings:

1. The overall number of teachers in the state remained relatively stable in the past 11 years. Year-over-year changes in the number of teachers remained between  $\pm 1\%$ . In the 2022–23 academic year, there were around 118,000 FTE teachers.
2. While some subject specialties saw their numbers increase, other fields experienced substantial declines. There was a 17% increase in the number of ELL instructors, but a 9% decrease in the number of world language instructors and 8% declines for both mathematics and science instructors.
3. Over time, the reasons public school staff provided for exiting their roles changed, with fewer reported instances of leaving due to not being offered reemployment. Retirements accounted for 20% to 30% of teacher exits from district employment across the study period. The proportion not being offered district reemployment declined from 25% to 15% of all reported exits.
4. Demographic changes in the student population and teacher workforce altered STRs by race/ethnicity. STRs for all non-white student groups declined over time, but are still far higher than STRs for white students.
5. Staffing increases are likely needed in ELL, computer science, and special education. STRs for ELLs have grown despite staffing increases. Computer science STRs declined slightly, but are still very high.
6. The number of new provisional teacher certifications declined substantially relative to the number of permanent exits from the teaching profession, suggesting looming staffing shortfalls. In 2013–14, there were three provisional certifications per permanent exit; in 2022–23, the ratio was one to one.
7. Of the 4,521 students who enrolled in postsecondary education with education declared as their major between 2013–14 and 2015–16, only 1,073 ultimately became teachers by 2022–23. Importantly, the percentage of males and Black students decreased at each milestone in the teacher workforce pipeline – completing an education degree, getting a teacher certification, and becoming a teacher.

### Data Limitations and Recommendations for NJDOE Collection

Throughout this report, Heldrich Center analysts attempted to document limitations inherent to the data used and the specific approaches to measurement. The report's reliance on state administrative records is a strength insofar as it analyzes population data, rather than relying on samples to estimate population traits. But the use of administrative data also means that analysts are limited to data collected for administrative purposes; as such, in some cases, they had to use imperfect indicators of important concepts. One example is the category of permanent teacher exits. Analysts included retirees, deceased teachers, and those who indicated having left teaching in this category. Exiting teachers in other categories (e.g., "assumed home duties," "maternity leave," and "in college or university") may also represent permanent exits, but since analysts could not assume this, they adopted a plausible if conservative estimate.

The process of preparing and analyzing data on teaching staff exits revealed two concerns, both of which are addressable through future data collection by NJDOE. The first is that it was difficult to ascertain the grade level and subject specialty of teachers who had exited district employment. This is because when a teacher exits, they are coded in the data as inactive, and thus not assigned a job code. Heldrich Center analysts addressed this issue by assigning inactive exiting teachers their last known job code from a previous year. This represents a potential limitation of this analysis – to the extent that the last known job code might not reflect the teacher's last role. To improve the accuracy of future reports in this series, it is recommended that **NJDOE include the most recently held job code(s) in records of exited teachers.** This recommendation will be discussed with key departmental personnel at the next quarterly meeting of the NJSDS Data Stewards Work Group, which informs development of NJSDS.

The second analytical concern relating to exiting teachers is already known to NJDOE, which is acting to address it. As noted in Table 1 on page 15, "no reason given" was one of the most common categories among teachers' reasons for exiting. This makes sense insofar as it represents a valid entry to the data collection system during the school years included in the analyses for this report. However, in the most recent year, the proportion of those reporting this response increased to 33%, compared to 20% to 24% throughout the rest of the study period. **It is critical to the goals for analyzing trends in the state's teacher workforce that the reason for leaving the position be clearer for a greater proportion of the exiting teacher population.** To that end, NJDOE has revised data collection protocols for the data element by providing an expanded option set of valid responses and eliminating the non-response option. Going forward with improved reporting, the quality of data analyses on teacher exits will improve but it will take a few years for more robust data to become available for analysis.

Additional data will enhance the ability of analysts to project real or looming teacher shortfalls. **Particularly, obtaining more nuanced data about teaching staff exits as well as the number of teaching staff vacancies in the state and each district would help for more accurately measuring and understanding both the overall and specific subject area staffing needs.** By collecting teacher vacancy data by district and subject area, NJDOE will soon be able to address vacancy trends more directly within and across school districts in New Jersey. Lacking such data, in the present report, analysts used STRs as an indicator of where needs are high and/or growing.

## Next Steps

Action steps have been identified and either have been or soon will be taken to address the two analytical concerns mentioned about NJSDS data elements pertaining to teaching staff who exit from their positions. NJDOE will be implementing a revised staff data collection plan for the 2024–25 school year that is expected to yield richer data about the reasons given for why teachers are exiting their positions. It is further anticipated that it will be possible to implement a change to the fields included with staff data files shared with NJSDS such that the fields capturing the last position(s) held be listed in the rows of records for staff when their employment status changes from active to inactive. This pair of changes should alleviate what presented analytical challenges in using administrative data from NJSDS to understand why recently employed teachers opted to leave their positions in New Jersey's public schools.

However, there remain additional gaps in the data currently available to analysts about the pipeline of prospective teachers that cannot be addressed through existing data. Postsecondary administrative data records capture data points about the students who enroll in an EPP and who complete the program, which limits analysis to measuring the proportion of completers as a subset of those who enrolled in a program. To shed light on the reasons why postsecondary students are choosing to no longer pursue teaching credentials and positions in schools, additional data would be needed. Review of the research literature on this topic, some of which was shared in the background for this report, provides the basis for developing a survey that could be administered to generate data that would help fill this gap. Future research may include qualitative data collection methods and survey research that investigate more precisely the reasons why college students reconsider their choice about becoming a teacher, so that analysts can better address the issue of pipeline leakages and present qualitative as well as quantitative findings for informing potential policy solutions.

In the meantime, Heldrich Center analysts will continue to explore investigative questions within the important topic of ensuring adequate staffing for all classrooms in the state's public schools, further analyzing the nuances of findings presented in this report and preparing for the second annual Teacher Workforce Report to be delivered in 2025. Pending data availability and quality, new data collected from NJDOE will be included in that analysis and will expand the breadth of what can be learned about the teacher workforce in New Jersey.

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# Appendix: Technical Methodology

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Heldrich Center analysts completed this analysis using data from the New Jersey Department of Education's (NJDOE) New Jersey Standards Measurement and Resource for Teaching (NJ SMART) data system, Office of the Secretary of Higher Education (OSHE) data, and other data stored in the New Jersey Statewide Data System (NJSDS), which is the state's centralized longitudinal data system for administrative data. This work focused on data that come from the Staff Member Identification (SMID) extract, which provided detailed information on staff members in each New Jersey Local Education Agency, certification and endorsement data that provided details on teachers' certifications, aggregate student-level data from NJ SMART, and postsecondary enrollment and completion data from OSHE. Analysts assessed the changes in the teacher workforce in New Jersey by addressing four research questions.

## Research Questions

1. What are the observed trends in New Jersey's teacher workforce, by the number (full-time equivalents) of teachers by subgroups, including race, sex, age, and subject area?
2. What are the trends in and reasons for exiting the teacher workforce in New Jersey by subgroups, including race, age, subject area, as well as job category?
3. What are the teacher workforce projections for various subject areas, and what subject areas are at higher-than-average risk of teacher turnover?
4. What are the trends and gaps in the workforce pipeline from postsecondary education, completion, certification, to entering the teacher workforce in New Jersey?

## Data Analysis

The Heldrich Center addressed these research questions through four main streams of analysis. Researchers first analyzed the current teacher workforce landscape by various characteristics over time, then assessed the trends and reasons for teacher exits by subgroups, including job categories. Researchers also reviewed K-12 student data, staff data, and certificates and endorsement data to make future projections about the teacher workforce needs for New Jersey in bilingual education and computer science as well as other subject areas that are at risk of teacher shortages. Finally, to assess trends and gaps in the teacher workforce pipeline, analysts conducted a case study of individuals entering postsecondary schools between 2013-14 and 2015-16, observing them throughout the teacher workforce pipeline from declaring and completing majors in education, obtaining teaching endorsements, and becoming teachers in New Jersey. Provided below is more information about the data sources and how they were used in this analysis.

### *Data Source: New Jersey Department of Education*

#### **NJ SMART Data**

To analyze the current teacher workforce landscape and pipeline, assess teacher exits by subgroups, and make projections, the Heldrich Center used NJ SMART data, which are housed within NJSDS, between the 2013-14 and 2022-23 school years. For each year, teachers were defined using the unique SMID within these data files and were limited to those that held a certificated teaching position (job code between 1000 and 2799) within the Local Education Agency for at least a portion of their time. Full-time administrators, certificated non-teaching positions, and non-certificated staff were not included in this analysis.

Analyzing these staff-level data enabled analysts to gain understanding about the roles individuals are serving in their district, and to create trends for changes in staffing levels by subject over time. Specifically, they calculated the total full-time equivalency for teachers within the job code range of 1000 to 2999. These job codes encompass categories such as elementary, middle grades (grades 5–8), art, business, English, world languages, health/physical education, family and consumer sciences, industrial arts, mathematics, financial literacy, music, science, social studies, supplementary instruction, resource program, teacher coach coordinator leader, and vocational education. See Table A-1 for specific job codes assigned to each subject area.

**Table A-1: Crosswalk of Subject Areas and Job Codes**

<b>Subject</b>	<b>Job Code</b>
Mathematics	1900–1999
Computer	1962, 2525, 2593, 2712, 2718
High School Science	2200–2299
English	1400–1499
Elementary	1000–1999
Middle School	1100–1199
Vocational Education	2500–2999
World Languages	1500–1599
High School Social Science	2300–2399
Health/Physical Education	1600–1699
Music	2100–2199
Art	1200–1299
English Language Learning Teacher	1485, 1486
Teacher Coach Coordinator	2410, 2412
Resource Program	2405, 2406
Supplementary Instruction	2400, 2401
Business	1300–1399
Family & Consumer	1700–1799
Financial Literacy	2001
Industrial Arts	1800, 1899



Detailed data on race/ethnicity from NJ SMART were combined to develop race/ethnicity variables to enable comparison and limit the impacts of required suppression rules due to low observations of certain racial and ethnic demographics. In doing so, five race/ethnicity identifiers were created: non-Hispanic Asian (Asian), non-Hispanic Black (Black), Hispanic (Hispanic), non-Hispanic white (white), and other. The “other” category includes teachers who identify as American Indian/Alaska Native and/or Native Hawaiian/Pacific Islander. Similarly, age was divided into categories (less than age 30, ages 30 to 39, ages 40 to 49, ages 50 to 59, and age 60 and above) and the proportion and median age within each age category was reported. Note that the age variable contained implausible values probably due to random error in data input, so analysts replaced everyone with an age less than 21 as missing.

Researchers analyzed teacher exits in two ways. In the first sets of analyses, which include breakdowns by race, gender, grade level, and subject area, and by reason for exit, analysts assessed all exits from district employment. District exits include permanent exits from teaching like retirement, leaving teaching, and death, as well as potentially non-permanent exits, including employment in other districts (inside or outside New Jersey, in non-public schools, or in colleges/universities), sabbatical, maternity leave, assuming home duties, prolonged illness, and continuing education. Teacher exit in these analyses is measured as the counts and proportion of people leaving the teaching profession in New Jersey in a year. For the later analysis of flows into and out of teaching, analysts focus on the ratio of new provisional certifications to permanent exits – those attributed to retirement, death, and intentionally leaving teaching. Table A-2 provides information on the exit codes and how they were categorized for Table 1 in this report.

**Table A-2: Crosswalk of Exit Reasons and Codes**

<b>Table Value</b>	<b>Code(s) Assigned to Value</b>
No reason given for resignation	28
Retired	40
In another New Jersey public school	2, 11, 16
Not offered reemployment	80-86, 90
Maternity leave	30
Assumed home duties	29
In a public school district outside New Jersey	12, 17
Left teaching	70
Another reason for exit	22, 23, 24, 26, 27, 33, 34, 60, 72, 92, 93
Granted leave/sabbatical	31, 32
In a non-public school	13, 18
Deceased	50
Prolonged illness	25
Continuing education	20
In a college/university	5, 14, 19

## Certification and Endorsement Data

Researchers analyzed state teaching certification and endorsement data between 2010 and 2023. Individuals pursuing teaching certifications must fulfill an endorsement that identifies the type(s) of subject area(s) they can teach. Since endorsements can be conferred by NJDOE at any time, all types of endorsements conferred for each calendar year were included. Because individuals may receive multiple endorsements, figures related to endorsements should not be interpreted as the number of new teachers or newly endorsed teachers, but instead the number of teachers that have received the credential that year. However, researchers have included provisional endorsement by subject areas as a proxy for new endorsements, to facilitate projections and comparison with teacher exits over time, and to give an idea of areas likely to be at risk.

Researchers used both certification and endorsement data, NJ SMART data, and demographic data for K–12 students, and publicly available data on adequate student-teacher ratios (STRs) to measure the propensity of teaching staffing levels to “adequately meet teaching needs” or be at “higher-than-average risk” of teacher turnover or program elimination. This measure is operationalized as the STR. The determination of the STR constitutes a pivotal aspect of this analysis, requiring a series of methodological and deliberate steps. Analysts began by identifying student enrollment across different subject areas and aligned them with the corresponding teacher categories within the specific job code range of 1000 to 2999. For each subject area, the STR ratio was calculated by dividing the total number of enrolled students by the full-time equivalent count of teachers possessing the relevant endorsements. This analysis is not meant to describe a typical class size for these teachers, but rather gain an understanding of the number of students relative to the numbers of certified teachers. Researchers then further categorized the STR, breaking it down by educational levels such as elementary and middle school, as well as by specialized student groups, including English Language Learners and computer education and special education.

## OSHE Data

To analyze the teacher workforce pipeline, this study used enrollment and completion data from OSHE within NJSDS to examine students seeking a bachelor’s degree at postsecondary institutions in New Jersey between 2013–14 and 2020–21. Selecting this period provided sufficient time – at least six years – for students to graduate. Analysts identified and tracked the outcomes of students who follow more traditional education pathways – who enroll for a bachelor’s degree in education and who complete a bachelor’s degree in education, obtain endorsements, and go on to become teachers. Due to collection limitations of data, this analysis does not include students following other non-traditional pathways.

Analysts jointly and individually examined the 2013–14 to 2015–16 academic cohort. Only students who were degree-seeking, first-time, or transfer students and were full-time students enrolled in a bachelor’s degree program in the fall of the academic year are included in this analysis. Using Classification of Instructional Programs (CIP) codes, analysts identified students for each academic cohort who enrolled and declared an education major (CIP code of 13). They also identified students who graduated with a degree in education using the CIP code of 13. Analysts merged OSHE data for those students who graduated with a degree in education to NJDOE’s certification and endorsement data, thereby observing students who obtained any teaching endorsement after graduation. Data for those students who obtained a teaching endorsement were then matched with NJDOE’s NJ SMART data to examine all those who enter the teaching profession in New Jersey and observe their exits.

Analysts also observed subgroups of students by race and gender. Detailed student-level data on race/ethnicity were combined to develop race/ethnicity variables to enable comparison and limit the impacts of required suppression rules due to low observations of certain racial and ethnic demographics. In doing so, seven race/ethnicity identifiers were created: non-Hispanic Asian (Asian), non-Hispanic Black (Black), Hispanic (Hispanic), non-Hispanic white (white), multiple races, and other. The other category includes students who identify as American Indian/Alaska Native and/or Native Hawaiian/Pacific Islander and those who do not specify their race. Due to suppression rules, analysts only report

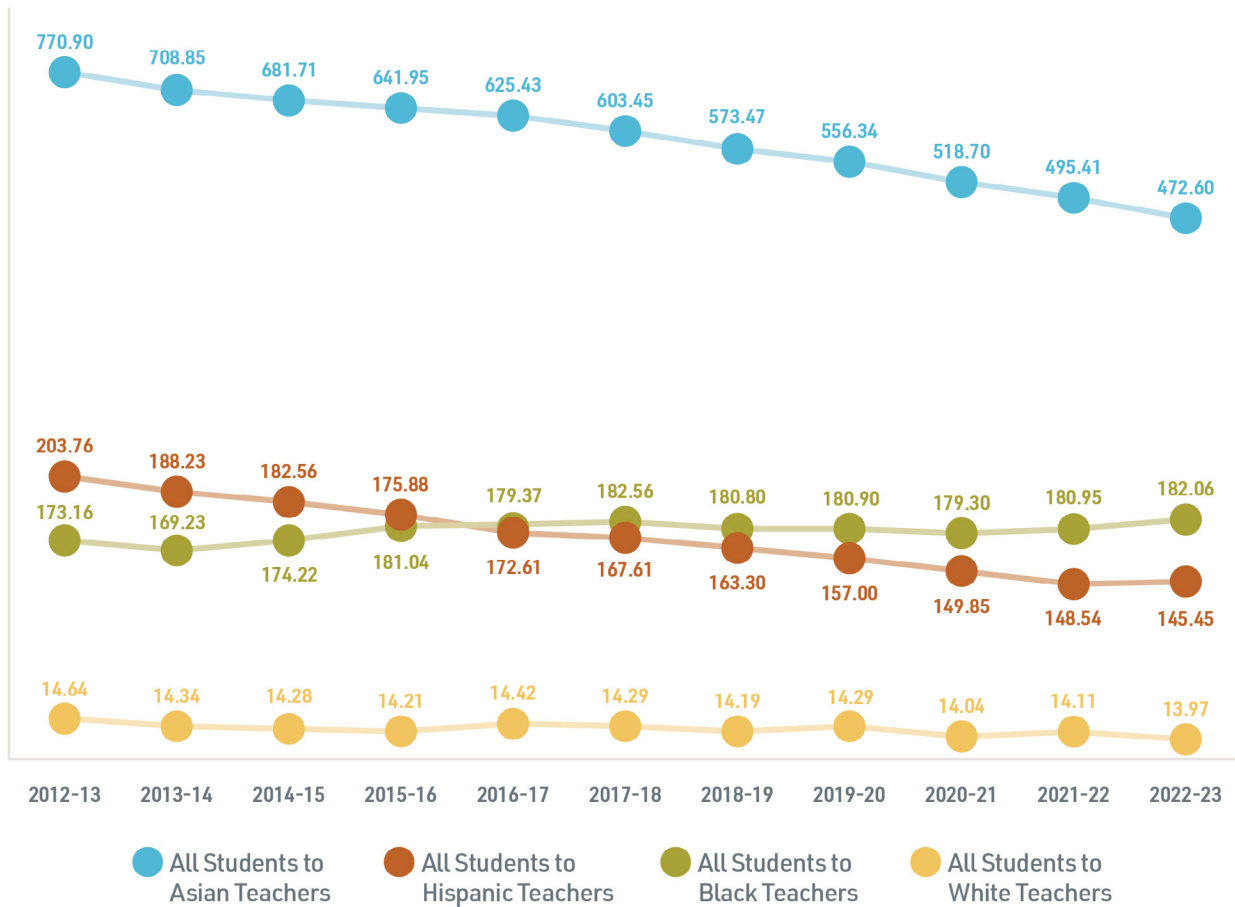
statistics for males and females. In addition, due to these suppression rules, this report provides results jointly for the three cohorts – 2013–14, 2014–15, and 2015–16 student cohorts – due to low observations in certain racial/ethnic and gender categories. However, the report briefly discusses results highlighting between cohorts in this analysis.

### Analytical Limitations

Apart from some of the limitations already highlighted, the analysis was confined to state-level estimates, for example, which may overlook local- and/or school-level elements that uniquely affect teachers. By complying with data security and confidentiality requirements associated with NJSDS data use standards, analysts also combined and/or suppressed categories with few records, constraining the depth of the analysis. These practices, while essential for data security and confidentiality requirements, add some limits to the scope of this analysis. Finally, it is important to note that longitudinal data require consistent tracking over time. Any interruptions or inconsistencies in the data collection may affect the analysis, so caution should be exercised in interpreting the results in areas where these inconsistencies may be present.

In Figure A-1, analysts calculated STRs over time by teacher race/ethnicity alone. The numerator in all calculations for Figure A-1 is the total number of students in the state in that school year. This is to be compared with Table 4 on page 20, which calculated STRs over time for students and teachers of the same race/ethnicity. Trends indicate that the STR for Asian teachers declined substantially and steadily in this period. Slight declines were observed for Hispanic and white teachers, while a slight increase is observed for Black teachers.

Figure A-1: Student-Teacher Ratios by Teacher Race/Ethnicity (alternate specification)



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## About the Heldrich Center

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The **Heldrich Center for Workforce Development** at Rutgers University is devoted to transforming the workforce development system at the local, state, and federal levels. The center, located within the Bloustein School of Planning and Public Policy, provides an independent source of analysis for reform and innovation in policymaking and employs cutting-edge research and evaluation methods to identify best practices in workforce development, education, and employment policy. It is also engaged in significant partnerships with the private sector, workforce organizations, and educational institutions to design effective education and training programs. It is deeply committed to assisting job seekers and workers attain the information, education, and skills training they need to move up the economic ladder.

As captured in its slogan, "Solutions at Work," the Heldrich Center is guided by a commitment to translate the strongest research and analysis into practices and programs that companies, community-based organizations, philanthropy, and government officials can use to strengthen their workforce and workforce readiness programs, create jobs, and remain competitive. The center's work strives to build an efficient labor market that matches workers' skills and knowledge with the evolving demands of employers.