

Building a Diverse Workforce for All Students: Oregon Educator Recruitment and Retention over Time and across Contexts

Prepared by University of California Irvine

Dr. Emily K. Penner¹, Aaron Ainsworth¹, and Dr. Yujia Liu²

June 28, 2024³

1. Introduction

Oregon's 1991 Minority Teacher Act (MTA) highlighted the importance of building and sustaining a diverse workforce of educators in classrooms across the State that reflected their students and communities. This ideal has guided policy about teacher composition, recruitment, and retention for over thirty years. Likewise, it has motivated the work of the Educator Advancement Council (EAC) to monitor progress toward achieving these goals since 2017. This companion report seeks to support the work of the EAC and the legislative commitments of the MTA in shedding additional light on several aspects of the work of diversifying and sustaining Oregon's educator workforce. It does so through four primary contributions. First, it considers teacher turnover relative to turnover among all other staff, highlighting how teaching needs and goals are situated in a larger staff ecosystem. Second, it focuses on the qualifications and trajectories of newly-entering teachers, examining ways that these educators support the state's equity goals. Third, it considers both of these investigations within a longitudinal perspective, highlighting changes and similarities across distinct economic contexts including the Great Recession, the COVID-19 pandemic, and the present. Finally, it examines the labor market outcomes for teachers who leave Oregon public schools, providing new insights into the factors that not only drive teachers out of the profession but also attract them to other fields.

1.1 Background

Educators are central to the success of students in school, and the contexts in which they work are key for supporting their ability to effectively serve students (Kraft & Papay, 2014). Understanding the characteristics of who is entering and exiting the workforce, and the context surrounding these decisions, is critical to efforts to equitably promote positive student outcomes. This is particularly the case as states across the country, like Oregon, work to diversify the education workforce in the hopes of better representing and serving students (NCTQ, 2023).

One of the most important dynamics shaping the educator workforce is turnover. Staff turnover, where employees leave for another school or exit the workforce, is a persistent, widespread concern due to its potential costs to student experiences and learning (Darling-Hammond, 1984; Ingersoll, 2001; Ronfeldt et al., 2013). To date, the public and research conversations about school turnover have primarily focused on teachers. Nationally, among public school teachers who were teaching during the 2020-21 school year, 8 percent

¹ School of Education, University of California Irvine

² College of Education and Human Development, University of Missouri

³ Any opinions and conclusions expressed herein are those of the authors and do not represent the views of the U.S. Census Bureau. The Census Bureau has ensured appropriate access and use of confidential data and has reviewed these results for disclosure avoidance protection (Project 7500420: *CBDRB-FY24-CES010-012*).

moved to another school the following year, while another 8 percent left the teaching profession (Taie & Lewis, 2023). Teacher turnover is often higher in schools with greater proportions of students of color and low-income students, and among teachers of color who are disproportionately concentrated in such schools, exacerbating challenges to improving teacher quality, teacher diversity, and opportunities to learn for minoritized and historically marginalized students (Goldhaber et al., 2020; Grooms et al., 2021; Sun, 2018). Many studies have investigated the causes of teacher turnover finding that a variety of issues including compensation, working conditions, preferences for particular work locations and student populations contribute to teachers' mobility between schools and exit from the profession (see Borman & Dowling, 2008; Grissom et al., 2016; Guarino et al., 2006 for summaries of this work). Additionally, teacher turnover appears to be influenced by broader economic factors, increasing during economic booms when outside job market opportunities are plentiful and declining during recessions when these options contract (Goldhaber & Theobald, 2023).

Yet teachers are far from the only adults students encounter in schools, comprising only 45 percent of K-12 employees (Bureau of Labor Statistics, 2021). While teachers are highly consequential for student outcomes (Chetty et al., 2014), there are many other adults working in various roles in public education to promote student success. Teachers, principals, and staff together comprise the institutional structures of schools that are intended to support students. School culture is created by the interactions of all staff and students within the whole community. Evidence increasingly suggests that school staff working in a variety of roles can be quite important to student outcomes (Best et al., 2018; Hemelt et al., 2021; Mulhern, 2020). Routine turnover among any of the staff groups working in schools may adversely impact colleagues, alter adult-student relationships, and ultimately affect student learning environments, making turnover among different staff an inter-related challenge schools may need to address (Boyd et al., 2011; Camburn et al., 2010; Hahnel et al., 2010). Furthermore, as states seek to recruit school staff, like paraprofessionals, to become teachers through Grow-Your-Own programs, turnover among school staff may deplete the pool of potential future teachers. Thus, it is important to understand teacher turnover in the context of turnover among other school employees over time.

Another important dynamic shaping the workforce is who is being newly recruited into the profession. Over 300,000 new teachers enter U.S. K-12 classrooms each year and need on-going support to improve their craft, help their students thrive, and persist in the profession (Clotfelter et al., 2007; Harris & Sass, 2011; Feiman-Nemser, 2001; Ganser, 2002; Ingersoll & Strong, 2011; Taie & Lewis, 2022). These newly recruited teachers tend to be more racially and ethnically diverse than older cohorts. However, about 30 percent of new teachers in the U.S. leave the classroom within five years while they are still in early phases of skill development and before they have had time to receive many such supports (Adnot et al., 2017; Darling-Hammond & Skykes, 2003; Grissom et al., 2016; Guarino et al., 2006; Smith & Ingersoll, 2004). Schools' organizational and social supports are especially important for beginning teachers, in part because they are more likely to be placed in schools with fewer supports and more challenging classrooms than their experienced peers (Bettini et al., 2020; Bruno et al., 2020; Johnson et al., 2012; Rogers & Doan, 2019; Mason-Williams et al. 2023). Given the demographics of new teachers, these high turnover rates among novices can impede efforts to increase the diversity of the workforce.

Public schools in the State of Oregon are also facing many of these national challenges and needs around teacher and staff turnover. The State Legislature has recently focused attention on acute needs around educator compensation that are integral to maintaining diverse and consistently-staffed classrooms (Helligso & Tate, 2023; O.R. Legis. Assembly, 2023). Likewise, recent work from the Oregon Longitudinal Data System has provided key evidence to situate Oregon's staffing challenges within the national context. Yet we still lack a clear understanding of many of the contextual factors surrounding educators' career pathways and decisions and more information is needed to support the continued goals of sustaining and diversifying Oregon's educator workforce.

Given the importance of understanding both the professional ecosystem in which Oregon's teachers work and how newly hired teachers contribute to Oregon's educator diversity goals, this report is guided by the following questions:

1. How does teacher turnover compare to that of other school staff in Oregon over time?
2. How do newly-hired teachers and their school contexts compare to those of the existing teaching force, and how do these comparisons vary over time?
3. How do Oregon teachers fare in the labor market if they exit Oregon public schools?

1.2 Data

We use statewide longitudinal staff data from the Oregon Department of Education (ODE), spanning from the 2006-07 to the 2022-23 school years, to gather information on educators' institutional assignments and their personal and professional characteristics. In addition, using ODE student data, we generate school- and district-level measures, providing information about educators' working environments and district contexts.

Our sample examining educator turnover encompasses all employees in Oregon public schools—including teachers, administrators, paraprofessionals, and other support staff ($N=1,187,572$ person-year observations, see Appendix A for a list of positions and groups). To further examine teacher turnover patterns by race/ethnicity and experience level, we restrict our analysis to teachers with school placements and at least 0.5 full-time equivalent (FTE). This restriction allows us to focus on teachers who are more fully involved in schools, as opposed to those who may have contracts limiting their time with students. In addition, our newly-hired teacher sample includes the individuals who are newly hired to work in Oregon public schools in any of the years between the 2007-08 and 2022-23 school years ($N= 18,826$ person-year observations) and who had at least 0.5 FTE.

Lastly, we linked the ODE staff position data between the 2006-07 and 2016-17 school years with IRS records at the U.S. Census Bureau to acquire educators' employment and earning records after they exited Oregon public schools. The linkage rates exceed 99%.

2. Turnover in the Educator Workforce

We examine turnover patterns across diverse educator groups over the past 15 years and through distinct economic contexts, including the Great Recession, the COVID-19 pandemic, and the present. Turnover comprises three categories based on year-to-year school assignments: (1) “Switched schools,” where educators moved to another school within the same district; (2) “Switched districts,” where educators relocated to a different district within the state; and (3) “Left workforce,” where educators exited the state public education system entirely.

2.1 Teacher, Administrator, Paraprofessional, and Staff Turnover

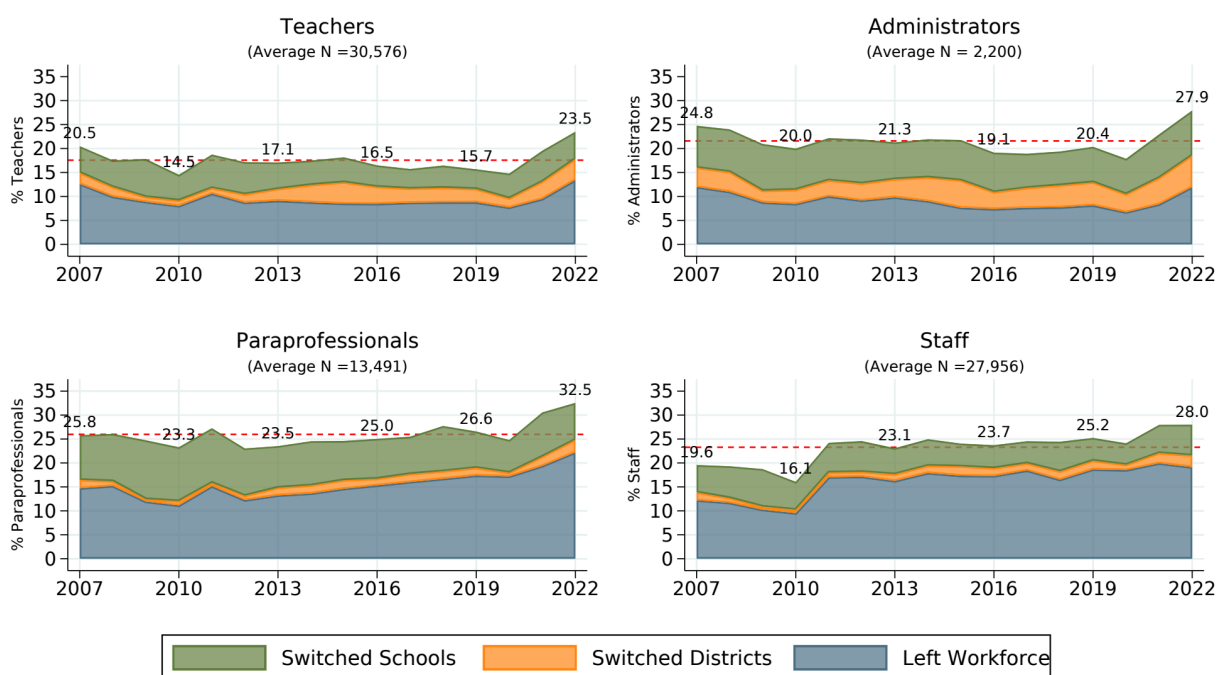


Figure 1. Educator Turnover in Oregon, 2006/07 - 2021/22

Note: Data from the ODE staff position file for all employees in Oregon public schools. The red horizontal line presents the average annual turnover rate for each group. The average annual total numbers of employed educators for each group are shown in parentheses.

Our sample examining educator turnover encompasses all employees in Oregon public schools—including teachers, administrators, paraprofessionals, and other support staff from the 2006-07 to the 2021-22 school years. Longitudinal analysis of turnover across educator groups in the Oregon public school system reveals a consistent pattern. As shown in Figure 1, before the COVID-19 pandemic, turnover rates were relatively stable. Rates were relatively high in 2007 when the broader labor market was good, declined through the onset of the Great Recession and increased in 2011 when school budgets in the state [were strained](#). Even throughout the recessionary period turnover was within a range of a few percentage points. However, after a slight

decrease in the 2019-20 school year, turnover for all groups surged significantly in the subsequent years. By the 2021-22 school year, turnover reached historic highs for all educators: 23.5% for teachers, 27.9% for administrators, 32.5% for paraprofessionals, and 28.0% for support staff. The turnover patterns throughout the pandemic period mirror trends observed in states like [Arkansas](#), [Massachusetts](#), [North Carolina](#), and [Washington](#).

Comparatively, teachers are the most stable group, with an average annual turnover rate of 17.6%. In contrast, administrators, paraprofessionals, and support staff show higher turnover rates: 21.6%, 26.0%, and 23.3%, respectively. A detailed analysis reveals that within each category, educators serving in special education roles experience higher turnover rates compared to those in general education, primarily due to greater mobility between schools or districts. Different educator groups exhibit distinct patterns of turnover: teachers and administrators have higher rates of switching between schools and districts, whereas paraprofessionals and other support staff are more likely to leave the Oregon public school system entirely. For example, on average, annual turnover for teachers includes 5.5% as school switchers, 2.6% as district switchers, and 9.4% as leavers. While for other support staff, the breakdown is 5.7% school switchers, 1.5% district switchers, and 16.1% leavers.

2.2 Teacher Turnover by Race/Ethnicity, Experience Level, and School Context

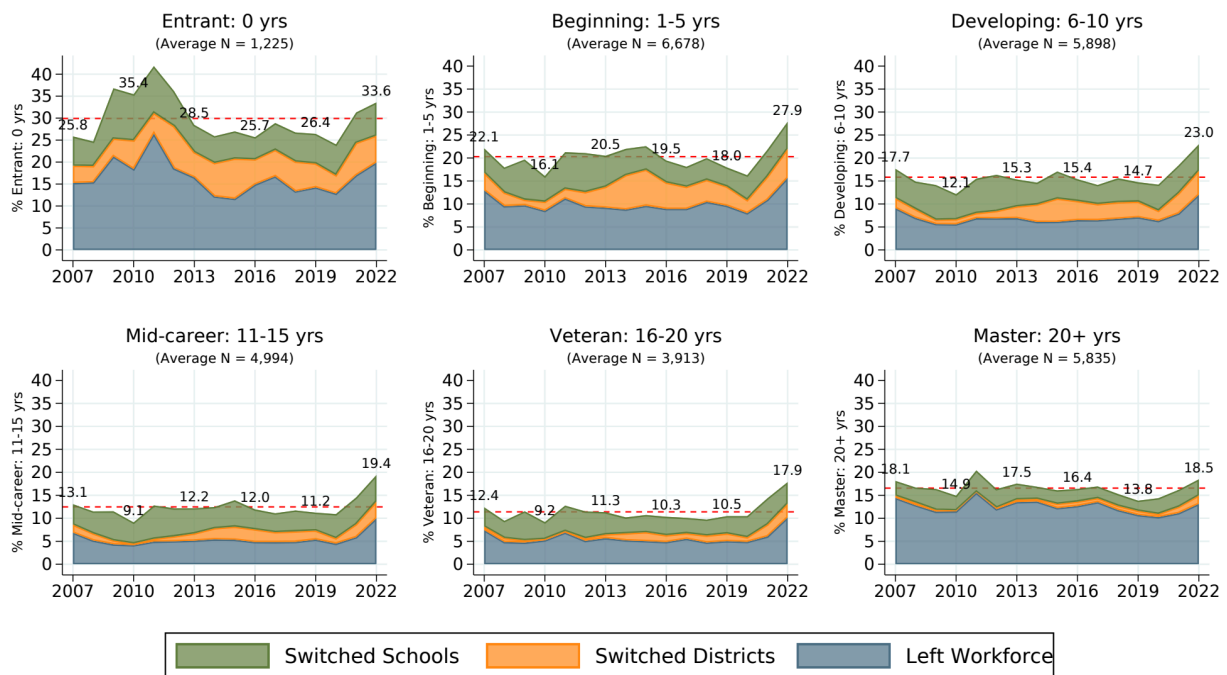


Figure 2. Teacher Turnover by Experience Level, 2006/07 - 2021/22

Note: Data from the ODE staff position file for teachers with at least 0.5 FTE. The red horizontal line presents the average turnover across all years. The average annual total numbers of employed teachers for each group are shown in parentheses.

Next, we restrict our sample to teachers with school placements and at least 0.5 FTE, exploring how turnover rates vary among teachers based on experience level, race/ethnicity, and the types of schools in which they work.

Figure 2 presents teacher turnover rates across various experience levels. Turnover rates are highest among entering teachers with zero years of experience, averaging 29.9% annually. The lowest turnover rates come from teachers with 16-20 years of experience, averaging 11.4% annually. After the COVID-19 pandemic, all teacher groups experienced a slight decline in turnover during the 2019-20 school year, followed by a sharp increase in the 2020-21 school year. Contrary to expectations but consistent with analysis from [other states](#), the surge in turnover after the COVID-19 pandemic is driven by teachers in the middle experience levels, rather than by entering teachers—who typically face higher turnover—or the most experienced teachers—who may have had more health-related concerns.

In general, as teacher experience levels increase, the rates of school and district switching decrease. Specifically, the average annual rate of school switchers decreases from 7.3% for entrant teachers with zero years of experience to 3.3% for master teachers with more than 20 years of experience, and the average annual rate of district switchers decreases from 6.0% for entrant teachers to 0.7% for master teachers. However, while the average annual rate of leaving the workforce decreases from 16.5% for entrant teachers to 5.4% for mid-career teachers, it starts to increase again for veteran teachers (5.7%) and master teachers (12.5%).

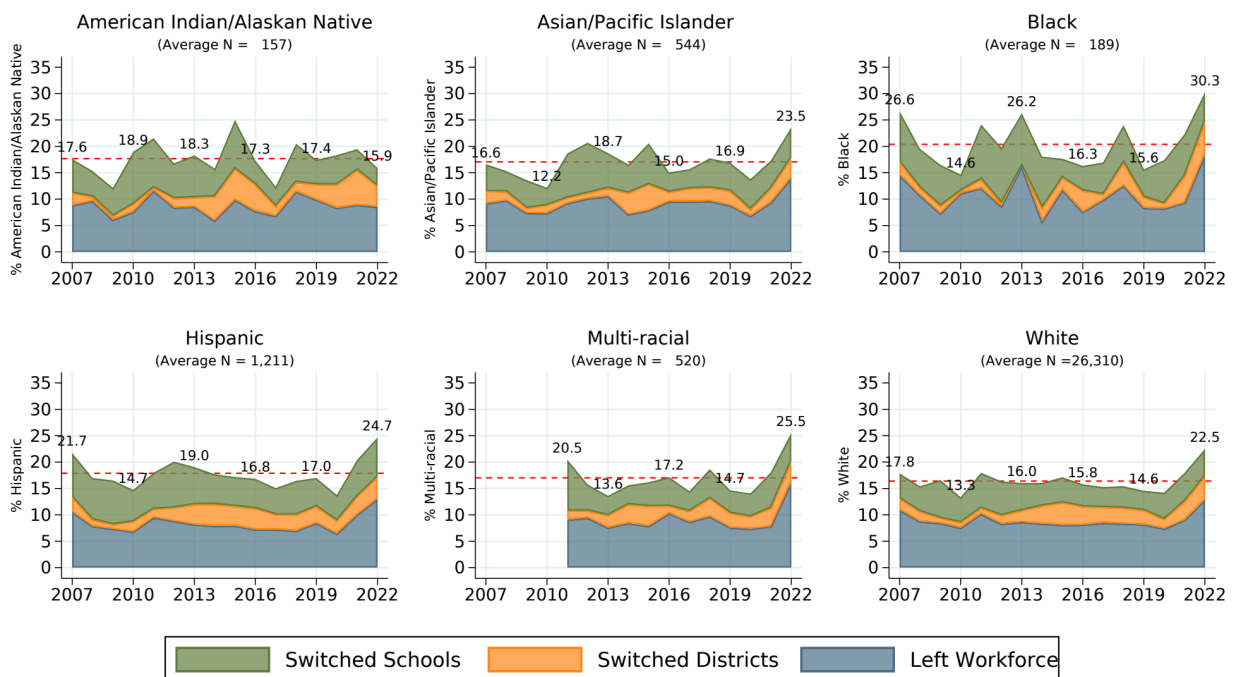


Figure 3. Teacher Turnover by Race/Ethnicity, 2006/07 - 2021/22

Note: Data from the ODE staff position file for teachers with at least 0.5 FTE.. The red horizontal line presents the average turnover across all years. The average annual total numbers of employed teachers for each group are shown in parentheses. Data for multi-racial teachers prior to 2011 are unavailable.

Figure 3 presents teacher turnover rates across different racial/ethnic groups. Among these groups, White teachers generally show the lowest turnover rates compared to teachers of color, though not consistently every year. On average, 16.6% of White teachers working in the Oregon public school system annually either switch schools, districts, or leave the system altogether. These rates are slightly higher for all other groups, ordered from lowest to highest: 17.0% for Multi-racial, 17.1% for Asian/Pacific Islander, 17.7% for American Indian/Alaskan Native, 17.9% for Hispanic, and 20.4% for Black teachers. All racial/ethnic groups, except American Indian/Alaskan Native, experienced a significant increase in turnover after the COVID-19 pandemic.

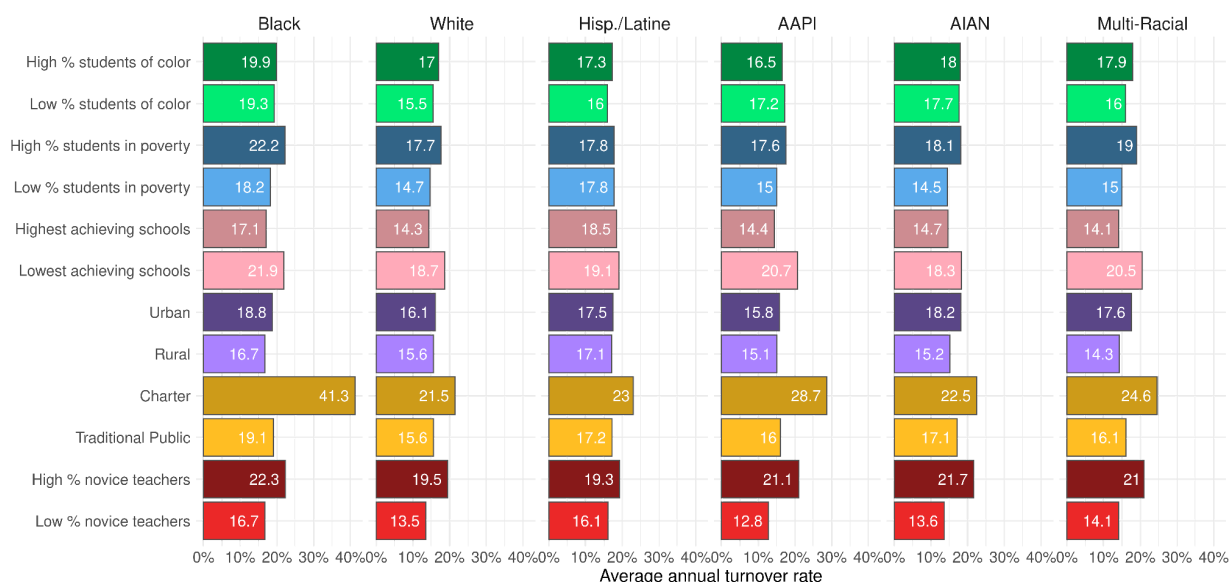


Figure 4. Teacher Turnover by School Context and Race/Ethnicity, 2006/07 - 2021/22

Note: Data from ODE staff position file combined with information from student data files. “AAPI” indicates “Asian American/Pacific Islander”; “AIAN” indicates “American Indian/Alaska Native”. “High/low % students of color” indicates schools with top or bottom quartile proportions of students of color. “High/low % students in poverty” indicates schools with top or bottom quartile proportions of students eligible for free or reduced-price lunch. “Highest/lowest achieving schools” indicates schools with top or bottom quartile average test scores in Mathematics and English Language Arts averaged together.

Figure 4 presents average annual turnover rates for teachers by school context and race/ethnicity. Teachers in certain school contexts exhibit higher turnover rates, and

the patterns are consistent across different racial/ethnic backgrounds. For example, teachers in schools with higher academic performance, as measured by average test scores in Mathematics and English Language Arts, generally have lower turnover rates compared to those in schools with lower academic performance. Additionally, teachers in schools with a higher proportion of novice teachers experience higher turnover rates than those in schools with a lower proportion of novice teachers.

3. Entering Teachers and Their Working Environments

In order to diversify the educator workforce in Oregon, a key consideration for whether such efforts will be successful over the long term is the characteristics of who is being newly brought into the system. As such, we examine the patterns of individuals entering the teaching profession in Oregon from the 2007-08 to the 2022-23 school year. We also explore the characteristics of the schools that these new teachers are entering into and compare them to their more experienced colleagues in the state and by race/ethnicity.

3.1 Entering Teachers' Diversity Over Time

Table 1 displays the characteristics of newly entering teachers, what we call “entrants”, from the 2007-08 to 2022-23 school years. Here, we define an entrant as a teacher with 0 years of experience who has not previously been observed as a teacher in another Oregon public school (though they may have worked in a non-teaching role in the system) and who has at least 0.5 FTE. We also report the median age of entrants, the percent of entrants who identify as a person of color, the percent of entrants who report having a native language other than English, the percent of entrants that are diverse educators, and the turnover rate for entrants. On average about 1,300 teachers begin their careers in Oregon public schools each year. The number of entrants fluctuated dramatically over the past 15 years with only 500 teachers entering in 2010 and just under 2,000 teachers entering in the 2022 school year. The fluctuation in entrants is consistent with the economic conditions and subsequent budgetary pressures surrounding the Great Recession. New teacher hiring dropped by over half going into the 2010 school year and remained well below 1,000 each year until 2014 when budgets and hiring began to recover. Turnover patterns among entering teachers followed a similar pattern, reaching a peak of 41% in 2011, declining through the pre-pandemic period, and rising again to 34% in 2022.

Table 1. Entering Teacher Demographics in Oregon from 2008-2023

Year	Number of entering teachers	Median age	% People of color	% Native language other than English	% Diverse educator	Turnover rate (moved + exited)	% Moved schools	% Exited
2008	1696	28	6.3%	0%	6.3%	24.7%	9.3%	15.4%
2009	1239	27	8.0%	0%	8.0%	36.8%	15.5%	21.3%
2010	505	28	9.8%	0%	9.8%	35.4%	17.0%	18.4%
2011	853	28	11.0%	0%	11.0%	41.9%	15.4%	26.5%
2012	614	29	9.0%	0%	9.0%	36.2%	17.6%	18.6%
2013	678	29	8.8%	0%	8.8%	28.5%	11.9%	16.5%
2014	1116	29	10.4%	0%	10.4%	25.9%	13.7%	12.2%
2015	1442	29	11.1%	1.6%	11.3%	27.0%	15.3%	11.7%
2016	1445	29	12.2%	3.5%	12.9%	25.7%	10.8%	14.9%
2017	1295	28	14.9%	5.0%	16.0%	28.9%	12.1%	16.8%
2018	1268	29	16.5%	5.4%	17.0%	26.7%	13.4%	13.3%
2019	1396	29	19.6%	5.9%	20.3%	26.4%	12.2%	14.3%
2020	1332	28	17.9%	7.9%	19.1%	24.0%	11.2%	12.8%
2021	1083	27	20.7%	6.8%	21.1%	31.3%	14.3%	17.0%
2022	1990	29	21.4%	5.7%	21.7%	33.6%	13.7%	19.9%
2023	1873	29	20.6%	6.7%	20.9%			

Note: Data from ODE staff position file for teachers with 0 experience and at least 0.5 FTE. “Diverse educator” refers to a teacher that either identifies as a person of color or that reports having a native language other than English.

Notably, throughout this period, Oregon has made substantial progress in diversifying the entering teacher workforce. From 2012 to 2022, the proportion of teachers of color among new entrants more than *doubled*, increasing from 9% to 21.4%. Despite a stagnation during the recession, progress resumed in 2014, with the diversity of entrants increasing each year, even throughout the pandemic. Compared to states like [Maryland](#), [Washington](#), and [Massachusetts](#), which have also established Grow-Your-Own initiatives and pursued strategies to diversify the workforce, Oregon has done as well as or better at increasing the racial/ethnic diversity of its entering teachers. Additionally, linguistic diversity has increased over time, with entrants having a native language other than English rising from 1.5% in 2015 to 6.7% in 2023.

In Figure 5, we plot the proportion of teachers, administrators, paraprofessionals, and other support staff that identify as people of color over time in the left panel, and the proportion of teachers by experience level in the right panel. As the figure demonstrates clearly, entering and beginning teachers with less than five years of experience are driving the overall increases in teacher diversity over time. Between 2011 and 2023 the proportion of teachers of color grew from 8.4% to 12.9% overall. However, as noted earlier, in this time entering teachers of color nearly doubled from 11% to 20.6%. Among beginners (1-5 years of experience) the proportion of teachers of color also nearly doubled. Thus, less experienced teachers are leading the way in diversifying the

workforce and, in order for those gains to trickle up the experience distribution and be sustained, these teachers must be retained.

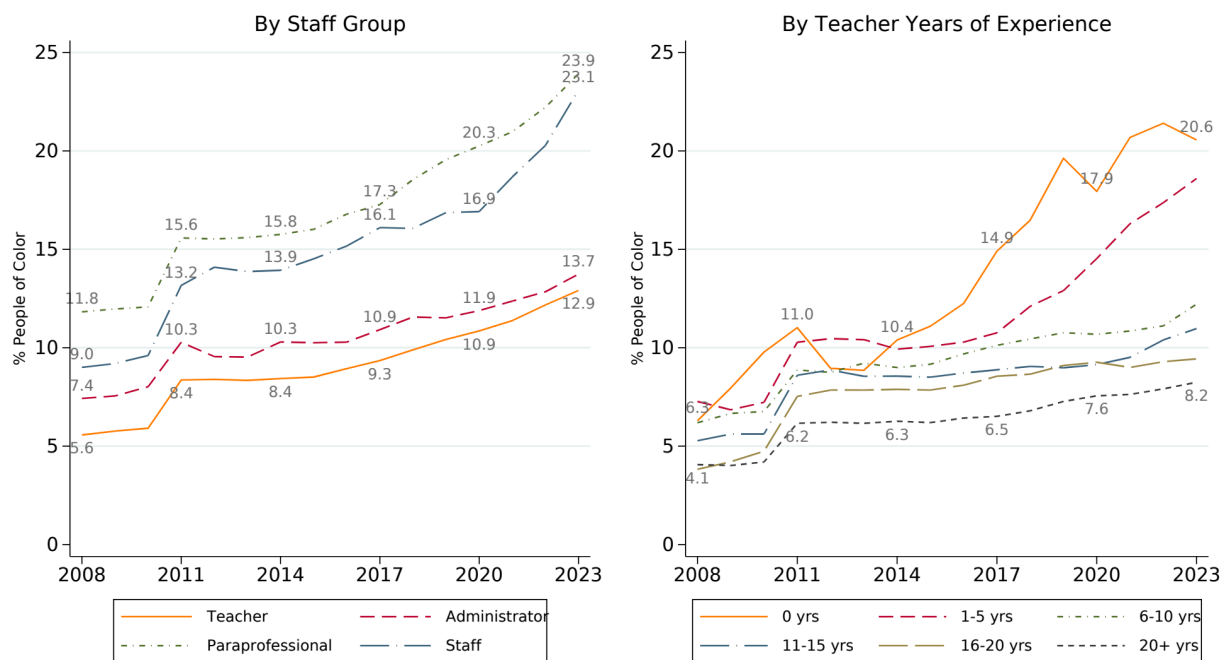


Figure 5. Percent People of Color across Years by Staff Group and Teacher Experience

Note: Data from ODE staff position file. For the teacher experience graph we restrict to teachers with school placements and at least 0.5 FTE.

3.2 School Environments of Entering Teachers

Given that entering teachers are substantially contributing to the state's diversity goals but at the same time have high turnover rates, questions arise about the characteristics of the schools in which they begin their teaching careers. When these entering teachers join Oregon's public schools, where are they teaching? In which kinds of school environments are they starting their careers and might this contribute to their turnover?

To understand the experiences of these entering teachers, we report the average characteristics of the teachers and the schools that they work in, categorized by experience level, from entrants (0 years) to master teachers (over 20 years). As seen in Table 2, entering teachers are more than twice as likely to identify as people of color and more than three times as likely to report a native language other than English compared to their most experienced colleagues. For the characteristics of the schools teachers work in, there is a clear gradient across nearly every reported factor, demonstrating that teachers across different experience levels tend to move towards certain types of schools over their careers. As teachers gain experience, the proportion

of economically disadvantaged students, English learners, students of color, and students who are suspended or expelled in their school declines. In contrast, the proportion of gifted students and the average academic achievement of students in the school increases as teachers gain experience. For example, entering teachers work in schools where the average students is 0.08 standard deviations below their grade level average in ELA and math, whereas master teachers work at schools where students are 0.02 standard deviations above. This means entering teachers, on average, work in schools at the 49th percentile of school-level student achievement whereas master teachers work in schools at the 60th percentile.

Similar experience-based patterns are observed in terms of the colleagues teachers have. Notably, entering teachers appear to be concentrated in schools with high levels of instability (more teacher turnover and new principals) and more inexperienced colleagues (measured by number of years teaching). For example, there are twice as many novice teachers (23%) in the schools where entrants teach compared to the schools where master teachers work (13.8%). Thus, entering teachers are disproportionately placed into schools where students may most be in need of additional support but, at the same time, have fewer experienced colleagues who might serve as mentors.

Table 2. Characteristics of Teachers and Their Schools by Experience Level (2008-2023)

	0 Entrant	1-5 Beginning	6-10 Developing	11-15 Mid-career	15-20 Veteran	20+ Master
Teacher characteristics						
% Female	71.6%	72.2%	71.6%	70.5%	69.0%	66.5%
% People of color	14.5%	11.6%	9.3%	8.5%	7.8%	6.3%
% Non-English native language	3.6%	2.3%	1.5%	1.4%	1.4%	1.0%
Age	28	32	37	42	47	54
% Has advanced degree	56.7%	71.2%	80.8%	79.1%	71.2%	59.6%
% Has license for position	97.5%	99.7%	99.9%	99.9%	99.9%	99.9%
Salary (in 2022 dollars)	\$45,646	\$54,250	\$64,731	\$75,926	\$81,899	\$82,007
% 1-year turnover rate	29.4%	20.0%	15.7%	12.4%	11.4%	16.5%
School characteristics						
% Rural	11.8%	11.7%	10.3%	10.1%	10.6%	11.7%
% Four-day week	7.4%	6.7%	5.9%	5.5%	5.6%	6.4%
% Charter school	6.3%	5.8%	3.9%	2.8%	2.2%	2.2%
Student characteristics at school						
Enrollment	636	662	713	726	718	697
Student-teacher ratio	19.1	19.3	19.8	19.9	19.7	19.6
% Students of color	37.6%	37.1%	36.6%	36.1%	35.4%	34.2%
% Econ. disadvantaged	59.9%	57.6%	55.6%	54.4%	54.6%	53.8%
% Special education	14.6%	14.5%	14.3%	14.2%	14.3%	14.3%
% Ever English learner (EL)	24.1%	23.5%	23.4%	22.9%	22.2%	20.5%
% Gifted	5.8%	6.3%	6.9%	7.1%	7.2%	7.1%
% Ever suspended or expelled	6.2%	6.2%	6.1%	5.8%	5.9%	5.9%
Average achievement (SD)	-0.08	-0.05	-0.01	0.01	0.01	0.02
Staff characteristics at school						
% Had a new principal	25.7%	23.7%	23.0%	22.4%	22.6%	22.3%
% Teacher turnover rate at school	21.0%	17.4%	16.5%	15.9%	15.6%	15.6%
Average years teacher experience	10.9	11.2	12.0	12.6	13.0	13.6
% Novice teachers (<3 years)	23.0%	18.2%	13.8%	13.0%	12.9%	12.8%
% Experienced teachers (>10 years)	48.1%	48.9%	52.8%	58.5%	59.4%	59.9%
% Teachers of color at school	10.1%	9.7%	9.3%	9.1%	8.9%	8.3%
Number of total teachers across years	19,825	106,691	93,981	79,966	63,126	92,512

Note: Data from ODE staff position file combined with information from student data files. Only teachers with 0.5 or above FTE are included. Cells report the average of a specific characteristic for each experience level across 2008-2023. Academic achievement is the average standardized score from ELA and Math state tests, thus capturing only tested grades and subjects in a school. Data for achievement are missing for the 2020 and 2021 school years.

This picture is largely true for entrants of all racial/ethnic backgrounds, though it is somewhat more pronounced for Hispanic/Latine teachers who tend to work in schools with more economically disadvantaged students, lower achieving students, and more English learners (see Table 3). Interestingly, however, Hispanic/Latine teachers have the lowest turnover rates of all entrants. When we examine the factors that most predict turnover among teachers, student achievement, having a new principal, and the percent of novice colleagues—all of which tend to favor more experienced teachers—emerge as

strong predictors. Together, these analyses suggest that while Oregon has successfully recruited more diverse teachers into the workforce, the school environments they are placed into may be contributing to their turnover, hampering the progress towards retaining diverse teachers who are early in their careers.

Table 3. Characteristics of the Entering Teachers and Schools They Work in by Race/Ethnicity (2008-2023)

	AIAN	AAPI	Black	Hispanic/ Latine	Multi- Racial	White
Teacher characteristics						
% Female	66.7%	76.1%	49.5%	71.7%	70.1%	71.8%
% Non-English native language	2.8%	16.4%	1.4%	31.0%	2.8%	0.4%
Age	30	28	33	28	28	28
% Has advanced degree	53.9%	67.1%	59.0%	41.6%	58.2%	57.9%
% Has license for position	94.3%	96.1%	95.8%	97.6%	98.9%	97.6%
Salary (in 2022 dollars)	\$44,268	\$46,410	\$48,756	\$46,708	\$47,564	\$45,504
% Turnover	34.4%	31.1%	32.8%	24.5%	29.0%	29.3%
School characteristics						
% Rural	17.2%	5.1%	4.2%	5.0%	7.2%	12.9%
% Four-day week	7.1%	2.9%	2.4%	3.6%	4.4%	7.6%
% Charter school	6.4%	8.0%	6.1%	2.9%	5.3%	6.3%
Student characteristics at school						
Enrollment	625	678	697	650	665	638
Student-teacher ratio	19	18.4	17.9	18.5	18.5	19.1
% Students of color	41.6%	44.0%	49.0%	52.9%	41.5%	35.3%
% Econ. disadvantaged	67.3%	55.4%	62.5%	71.4%	58.3%	57.9%
% Special Education	15.6%	13.9%	16.1%	14.3%	15.1%	14.5%
% Ever English Learner (EL)	24.2%	26.2%	23.1%	37.9%	24.0%	23.3%
% Gifted	4.5%	7.5%	7.2%	5.5%	6.8%	5.9%
% Suspended or expelled	5.8%	4.9%	5.9%	4.9%	5.1%	5.8%
Average achievement (SD)	-0.24	-0.01	-0.14	-0.22	-0.07	-0.07
Staff characteristics at school						
% Had a new principal	25.8%	25.7%	29.0%	26.9%	24.3%	25.5%
% Teacher turnover rate at school	22.8%	20.8%	21.9%	21.2%	20.9%	20.9%
Average years teacher experience	10.7	10.8	10.9	10.4	11.1	11
% Novice teachers (<3 years)	24.1%	22.7%	22.4%	23.8%	21.4%	23.0%
% Experienced teachers (>10 years)	46.4%	47.8%	47.8%	45.6%	49.6%	48.1%
% Teachers of color at school	16.5%	18.2%	17.6%	21.8%	16.6%	8.1%
Number of total entrants across years	141	587	212	1682	361	18,421

Note: "AIAN" indicates "American Indian/Alaska Native"; "AAPI" indicates "Asian/Pacific Islander". Data from ODE staff position file combined with information from student data files. Only teachers with 0.5 or above FTE are included. Cells report the average of a specific characteristic for each experience level across 2008-2023. Academic achievement is the average standardized score from ELA and Math state tests, thus capturing only tested grades and subjects in a school. Data for achievement are missing for the 2020 and 2021 school years.

4. Outcomes for Exiting Teachers

In addition to considering turnover and school context features of educators and new teachers, we also examine some of the labor market outcomes of teachers who stop working in Oregon public schools. We use data from ODE linked to IRS data at the

U.S. Census Bureau to consider these career alternatives and outcomes for all teachers and novice teachers (those with 0-1 years of experience) for teachers that were employed between the 2006-07 and 2016-17 school years and subsequently left all Oregon public school positions.

We first examine the degree to which leavers are employed and if so whether they work within the field of education (but not in an Oregon public school). Table 4 reports employment outcomes for teachers one and four years after leaving Oregon public schools, for all teachers and novice teachers.

Table 4. Employment Outcomes After Leaving Between 2006-07 to 2016-17

	All Teachers		Novice Teachers	
	1 Yr After Leaving	4 Yrs After Leaving	1 Yr After Leaving	4 Yrs After Leaving
Employed	62.66%	52.55%	88.50%	83.80%
Employed in Education	48.18%	39.57%	66.30%	60.60%
N	19,500	19,500	3300	3300

Note: Data from U.S. Census Bureau (Review number Project 7500420: CBDRB-FY24-CES010-012). Outcomes are reported for teachers who exit employment with Oregon public schools and do not return later. Novice teachers are those who had 0 or 1 year of experience before exiting. Samples rounded to comply with disclosure requirements.

Among teachers that left, only 62.7% remain employed one year after leaving. Nearly half are unemployed four years after leaving. This suggests that a non-trivial number of leavers are moving to unemployment (or retirement) rather than finding a new position. A much greater share of novice leavers are employed after exiting Oregon public schools (88.5%), although this number shrinks to only 83.8% four years after exit.

Given that many leavers are moving to other positions, we also examine the fields into which they move. Table 5 presents the subsequent industries of employed leavers one and four years after exit. Any cell with missing data had too few cases to report.

Table 5. Distribution of Employment Sectors for Employed Leavers One Year after Leaving

Industry	All Teachers		Novice Teachers	
	1 Yr After Leaving	4 Yrs After Leaving	1 Yr After Leaving	4 Yrs After Leaving
Education	76.89%	75.30%	75.0%	72.2%
STEM	0.6801%	0.8979%	0.830%	1.17%
Health & Soc. Asst	3.328%	3.939%	3.73%	3.65%
Govt & Pub Svc	1.401%	1.776%	1.42%	2.04%
Non-Profit	2.623%	2.723%	2.56%	2.88%
Finance, Bus & Real Est.	2.583%	2.954%	2.42%	3.32%
Food & Bev Svcs	1.190%	1.207%	1.59%	1.46%
Retail	1.943%	1.718%	1.94%	1.82%
Media, Info & Library Sciences	1.457%	1.303%	1.28%	1.39%
Tourism, Recr & Entertainment	1.376%	1.381%	1.80%	1.72%
Other Professional Svc	0.4615%	0.5889%		0.84%
Admin, Support, Personal Svc	1.757%	1.941%	2.52%	2.41%
Ag., Nat. Resrc, Utilities, Waste	0.8501%	0.7627%		
Manufacturing, Transpo, Construction			1.97%	2.48%
Missing	1.636%	1.670%	1.83%	1.90%
Total	12500	10500	2900	2700

Note: Data from U.S. Census Bureau (Review number Project 7500420: CBDRB-FY24-CES010-012). Outcomes are reported for teachers who exit employment with Oregon public schools and do not return later but are observed employed somewhere else. Novice teachers are those who had 0 or 1 year of experience before exiting. Industries are coded from the North American Industry Classification System based on the employer's tax identification number. Blank cells represent values suppressed because of small sample size. Samples rounded to comply with disclosure requirements.

We see few notable differences in the types of fields leavers transition to by experience. Over three-quarters of leavers move to a new position within the field of education. This field includes anyone who moves to a private K-12 school within Oregon or a public or private K-12 school outside of Oregon. This also includes anyone who moves to the early-childhood or higher education sectors, as well as those who move to education-oriented organizations (e.g., tutoring companies, after-school programs, testing service providers, business or trade schools, etc.). No other field attracts more than 4% of leavers. The most common non-education fields are Health & Social Assistance (roughly 3.6%), Non-Profit (roughly 2.6%), and Finance, Business, & Real Estate (roughly 2.7%).

Given that salary is an important factor identified in the literature as motivating teacher departure, we also examine the magnitude of leavers' salary changes prior to the year before they exit Oregon public schools. Table 6 shows the distribution of salary changes one and four years after exiting Oregon public schools for employed leavers.

Table 6. Distribution of Change in Income for Oregon Staff One Year after Leaving (among Employed Teachers)

Change in Income	All Teachers		Novice Teachers	
	1 Yr After Leaving	4 Yrs After Leaving	1 Yr After Leaving	4 Yrs After Leaving
Below -\$30,000	25.92%	11.08%	3.73%	2.30%
-\$30,000 to -\$25,001	5.854%	3.282%	3.08%	1.75%
-\$25,000 to -\$20,001	6.137%	3.736%	4.32%	2.70%
-\$20,000 to -\$15,001	6.761%	4.509%	5.84%	3.91%
-\$15,000 to -\$10,001	7.603%	4.750%	8.82%	4.67%
-\$10,000 to -\$5,001	7.894%	5.667%	10.7%	6.06%
-\$5,000 to -\$0.01	8.882%	7.366%	12.2%	7.63%
\$0 to \$4,999	8.445%	8.573%	12.4%	8.91%
\$5,000 to \$9,999	7.538%	9.645%	11.5%	8.91%
\$10,000 to \$14,999	4.882%	10.20%	7.71%	9.64%
\$15,000 to \$19,999	3.603%	8.322%	6.99%	9.71%
\$20,000 to \$24,999	2.202%	6.179%	4.22%	9.09%
\$25,000 to \$29,999	1.749%	5.339%	3.46%	7.92%
\$30,000 and Above				
N	12,500	10,500	2,900	2,700

Note: Data from U.S. Census Bureau (Review number Project 7500420: CBDRB-FY24-CES010-012). Outcomes are reported for teachers who exit employment with Oregon public schools and do not return later but are observed employed somewhere else. Novice teachers are those who had 0 or 1 year of experience before exiting. Changes in income are calculated from the individual's final teaching salary prior to exit. Blank cells represent values suppressed because of small sample size. Samples rounded to comply with disclosure requirements.

Many teachers initially experience earnings losses the first year after they leave Oregon public schools (69% of all leavers and 49% of novice leavers). Over a third experience a decrease of \$20,000 or more. In contrast, a third of all teachers experience earnings increases the next year, and 46% of novice teachers earn more the year after they leave relative to the year before leaving. Earnings changes are more favorable for a greater fraction of leavers four years after exit. Over 48% of all leavers and 54% of novice leavers earn more four years later. Fewer experience earnings losses, but it is still a substantial proportion (40% of all leavers and 29% of novice leavers). These results suggest bifurcated labor market outcomes for leavers. Many leave the labor market or earn very low wages, likely from part-time work. Another group improves their earnings, many at levels that exceed what they might have gained from gaining four years of experience in their salary schedules. This is especially the case for novice teachers who leave. Over a third of employed novice leavers experience earnings increases of \$15,000 or more.

These findings echo similar results from a large western school district documented by Brummet et al. (2024). In that district, roughly 20% of leavers were employed, and over a quarter experienced substantial earnings reductions. A substantial portion also experienced earnings increases, although many experienced increases that were larger than those of most Oregon public school leavers. Given that

many leavers are exiting for either less pay or relatively small earnings changes, even modest pay increases might help with retention. However, other job factors likely also play an important role in teachers' decisions to leave Oregon public schools and small pay increases may not be sufficient for some leavers to remain in the classroom.

5. Evidence of Promising Practices in Oregon to Support Retaining Diverse Teachers

Given the patterns of teacher recruitment and retention in Oregon, what might help to ensure the stability and diversity of the educator workforce? This is a question on the minds of many education policymakers and other stakeholders across the U.S., prompting many states to pursue a variety of strategies (see Carver-Thomas, 2018 and NCTQ, 2023 for reviews). A full review of this body of work is beyond the scope of this report, though we provide some evidence of promising practices from our own research in Oregon. In particular, we have examined how different policies stand to affect teacher retention. This work is particularly relevant given the post-pandemic uptick in turnover observed among all teachers and the consistently high turnover rates among teachers of colors, new teachers, and special education teachers in particular.

A large body of research demonstrates that teachers, like other professionals, make career decisions primarily based on two factors: pay and working conditions (Boyd et al., 2005). Thus, interventions aiming to improve teacher retention need to target one of these areas or a combination of both. Our research has looked at the effects of both kinds of changes on retention. In work done with Dr. Chris Candelaria and Liliane Nienstedt of Vanderbilt University, we explore the impact of increases to teacher salaries on turnover rates in Oregon. We leverage the fact that when salary schedules change, some experience bands might see larger or smaller increases than other experience bands. By looking from 2007-2017, we can examine how changes to salaries at different experience bands within and across districts over time influences turnover. We find that a 10% increase in salary decreases the teacher turnover rate by 1.4 percentage points (i.e. 14% turnover rate to 12.6% turnover rate). However, this conceals meaningful variation among different groups. We find a U-shape in the responsiveness of teachers to salary, with both early-career novice teachers and late-career teachers being more responsive to increases in base salary. We also find that special education (SpEd) teachers are substantially more responsive to salary changes. For SpEd teachers, a 10% increase in salary is associated with a 3.5 percentage point reduction in turnover, an impact twice the size of what it is for general education teachers. Thus, to the extent that Oregon considers reforms to teacher pay in the coming years, our evidence suggests that these efforts might be particularly effective for two groups Oregon might hope to influence most: early-career teachers and special education teachers.

We also have explored two different policies that aimed to change working conditions, yielding mixed results. In the first paper, we examined the effect of four-day school weeks (4dsw) on teacher turnover. Switching to a four-day schedule has recently become a popular tool for recruiting and retaining teachers in other states (Heubeck, 2022), though Oregon schools have long implemented the schedule to serve the needs of its more rural communities (Thompson et al., 2022). We look at the expansion of 4dsw use in the state from 2008-2015 and track turnover rates using methods that allow us to isolate the effect of the schedule change. Somewhat contrary to expectation, we find that 4dsw adoption does not improve retention rates, and, in fact, might make them worse. It appears that the increased turnover may in part be explained by gaps in salary that grow between four-day and five-day districts over time after the policy is adopted, consistent with our previous work on salary.

In another paper, we examine the effects of the Oregon Beginning Teacher Mentoring Program. This initiative began in the 2009 school year and provided funding to districts to implement mentoring for new teachers including professional development and one-on-one coaching with an experienced mentor teacher. Using the fact that districts got access to funding for this program at different times and that some cohorts of new teachers got access to the program while others did not, we are able to measure the effect of participating in the program. We find large reductions in turnover among participating teachers, reducing the rate at which new teachers exit the public education system by 14.8 percentage points. These reductions are larger for teachers of color, suggesting that the program was particularly effective for retaining diverse educators.

Together, our research suggests that pay and working conditions are important for teacher retention, and that both of these factors are indeed subject to be influenced. These factors also appear to be particularly important for new teachers, which is important to consider as Oregon works to diversify their educator workforce. As demonstrated earlier, Oregon has been improving the diversity of their entering teachers over time. Retaining these newest cohorts of teachers is an important task in order to maintain those strides. We have not studied why Oregon has been able to recruit a more diverse workforce in recent years but this is an important area for future research, particularly as it relates to the expansion of Grow-Your-Own programs across the state.

6. Conclusion

In this companion report, we seek to support the work of the EAC and state more broadly as it aims to create an educator workforce that reflects the diverse identities and experiences of students in Oregon. Using data from ODE and the U.S. Census Bureau covering nearly two decades, we hope to put trends in teacher recruitment into context. We find that teachers, relative to other employees in the school system, are the most stable and have consistently lower turnover rates. However, there was an uptick in turnover among teachers after the pandemic to levels higher than has ever been

observed. The post-pandemic increase was driven by teachers with typically low turnover rates: mid-career teachers with between 6 to 20 years of experience. The average turnover rate also obscures differences by race/ethnicity, with teachers of color having higher turnover rates than White teachers in almost every year.

Over time, Oregon has made substantial progress in attracting more racially, ethnically and linguistically diverse teachers into the profession. However, many of these educators are concentrated in schools that have high turnover rates and many other new teachers. This also means that they have relatively fewer experienced teachers to serve as mentors and that these teachers might have higher mentorship burdens as they support larger numbers of their entrant colleagues. These types of environments may not be most conducive to inducting teachers into the field and supporting them in their early years.

By tracking teachers in Oregon out of the public education workforce we also provide insight into the decisions and tradeoffs teachers may be facing. We document that most teachers do not have increased earnings after exiting and that a substantial set are unemployed. Of those employed, many remain connected to the field of education in some way. Even four years later, only slightly more than half of teachers are earning more money than they did before they left teaching in Oregon public schools. This suggests that perhaps even modest amounts of money might influence teacher retention and that addressing other aspects of the job, like working conditions could be important. Indeed, in other research, we find that salary increases and providing mentoring support to teachers can have a positive impact on retaining teachers. As Oregon schools look ahead to continuing to diversify the educator workforce in the years ahead, there is progress to celebrate and promising pathways forward. At the same time, there is much work still to be done in order to meet the goal of building an educator workforce that represents the rich diversity of the students the state is tasked with serving.

Appendix A. Staff Group Definition

We use position codes provided in the Oregon staff position data to identify 11 detailed staff groups based on the similarity of job types, necessary qualifications, pay, and demographics. These detailed staff groups are then combined into 4 simplified groups: teachers, administrators, paraprofessionals, and other staff.

“Teachers” include those working in both general education and special education fields. “Administrators” include both school-level leaders (e.g., principal) and district-level leaders (e.g., superintendent), as well as special education administrators. “Paraprofessionals” are individuals who work to support teachers and students in classrooms, covering both general and special education. “Other staff” is a broad category encompassing various roles, including school psychologists, nurses, library assistants, and administrative secretaries. See Table A1 for a list of staff position codes and groups.

Table A1. Staff position codes and groups

Simplified Staff Group	Detailed Staff Group	Positions Recorded in Administrative Data
Teachers	General Education	Head Teacher, Non-Special Ed Teacher, Non-Special Ed
Teachers	Special Education	Special Education Teacher (Non-PE) Special Education Teacher (PE)
Administrators	School-Level	Principal Assistant Principal
Administrators	Top District-Level	Superintendent Assistant Superintendent
Administrators	Special Education	Special Education Administrator, Director Special Education Administrator, Other Administrative Position
Paraprofessionals	General Education	Paraprofessional (Educational Assistant), Non-Special Ed
Paraprofessionals	Special Education	Special Education Paraprofessional
Staff	General Education Licensed	Instructional Coordinator/Supervisor, Non-Special Ed Psychologist, Non-Special Ed Library/Media Specialist Guidance Counselor, Non-Special Ed Other Licensed Staff, Non-Special Ed Nurse, Non-Special Ed School Social Work

Staff	Special Education Licensed	Special Education Audiologist Special Education Speech Pathologist Special Education Interpreter Special Education Psychologist Special Education Occupational Therapist Special Education Physical Therapist Special Education Recreational/Therapeutic Specialists Special Education School Social Workers Special Education Medical and Nursing Staff Special Education Counselors and Rehab Counselors Special Education Orientation and Mobility Specialists Special Education Other Services, Licensed
Staff	School and District Support	District Support (Non-Licensed, Non-Special Ed) School Support (Non-Licensed, Non-Special Ed) Student Support (Non-Special Ed) Library/Media Support Other Non-Licensed Staff, Non-Special Ed
Staff	Special Education Support	Special Education Administration, Support Staff Special Education Other Services, Non-Licensed

Appendix B. Additional Resources

For more information about the research we have described above and other works examining educator labor markets in Oregon, please refer to the following working papers. To request copies, please contact Emily K. Penner, emily.penner@uci.edu.

Educator Turnover

The majority of the work described above derives from the following working paper on:

Penner, Emily K., Yujia Liu, and Aaron J. Ainsworth. (2023). Revolving School Doors? A Longitudinal Examination of Teacher, Administrator and Staff Contributions to School Churn. (EdWorkingPaper: 23-777). Retrieved from Annenberg Institute at Brown University: <https://doi.org/10.26300/vy4x-d198>

Abstract

Non-teaching staff comprise over half of all school employees and their turnover may be consequential for school operation, culture, and student success, yet we lack evidence documenting their attrition. We use 11 years of administrative data from Oregon to examine mobility and exit among teachers, administrators, paraprofessionals, and other staff. Although teachers dominate staff turnover conversations, they are consistently the most stable employee group. Some school factors, like the proportion of students being disciplined, predict higher turnover rates for all employees, but within-school turnover between staff groups is weakly correlated and some school context variables are differentially associated with the turnover of various employee groups. Results suggest that employee turnover in schools is not a homogenous phenomenon across staffing groups.

New Teacher Mentoring

Liu, Yujia and Emily K. Penner (2024) Does Mentoring Impact Beginning Teacher Retention? A Longitudinal Program Evaluation.

Abstract

This study examines the causal effect of a state-level mentoring program for beginning teachers on teacher turnover, using seven years of administrative data from approximately 200 school districts. It takes advantage of the rotation of financial support for the program across districts over time and uses reduced form and instrumental variable research designs to address selection bias related to the availability of mentoring. The analysis suggests that this mentoring program affects the retention of novice teachers within schools, districts, and the state in different ways. On average, program participants are 14.8 percentage points less likely to leave the state public schools within one year. Participants of color and teachers working in districts with

higher levels of teacher and student diversity appear to experience even greater retention benefits. While the programs have a positive impact on novice teacher retention at the state-level, it has no significant impact on school-level retention and may contribute to an increased likelihood of teachers moving to other school districts. This study provides valuable insights that help reconcile the discrepancies among descriptive, quasi-experimental, and experimental studies examining the effects of mentoring on the retention of beginning teachers. The results suggest that mentoring programs should be complemented by specific support for teachers in individual schools and districts, which would help to improve the equitable distribution of teachers across educational institutions.

Four Day School Week

Ainsworth, Aaron, Emily K. Penner, and Yujia Liu. Less is More? The Causal Effect of Four-Day School Weeks on Employee Turnover.

Abstract

The use of four-day school weeks (4dsw) in the United States has expanded rapidly over the past two decades. Previous work examines the impact of four-day weeks on student outcomes, but little research to date examines the effect on school employees who are also intended beneficiaries of these schedules as schools in some locales seek new strategies to recruit and retain staff. This paper examines the effect of 4dsw adoption in Oregon on teacher and other school staff retention by leveraging a staggered roll-out of the schedule using a difference-in-differences design. We find that adopting a four-day week increased turnover by 3 percentage points among teachers in the initial year with turnover subsiding in the short term and then increasing again in the longer term. Turnover among non-teaching staff was mostly unaffected by the schedule change. There is suggestive evidence that increases in teacher turnover are, in part, mediated by salaries that fall further behind five-day schools after policy adoption. The findings suggest that policymakers interested in implementing 4dsw for improved school employee retention should exercise caution and be attentive to the full set of incentives offered to staff.

Relative Salary Changes

Candelaria, Chris. Liliane Nienstedt, Emily K. Penner, Aaron Ainsworth, and Yujia Liu. Should They Pay, or Should I Go? Differential Responses to Base Salary Increases

Abstract

This study uses administrative data from Oregon to estimate the extent to which base salary reduces teacher turnover and to investigate whether these effects are heterogeneous by teacher characteristics. We find that increases in salary are associated with decreases in teacher turnover – in our fully specified model we estimate that a 10% increase in current and future base salary is associated with a 1.5 percentage point decrease in turnover. This relationship appears to attenuate for mid-career teachers, and we do not find a statistically significant difference between teachers with BA and MA degrees. Lastly, we find that teachers in special education positions are more responsive to salary increases than those only assigned general education classes. These insights help provide a better understanding of the ways that salaries may impact teacher staffing challenges across different teacher characteristics.

References

- Adnot, M., Dee, T., Katz, V., & Wyckoff, J. (2017). Teacher turnover, teacher quality, and student achievement in DCPS. *Educational Evaluation and Policy Analysis*, 39(1), 54-76.
- Bacher-Hicks, A., Chi, O. L., & Orellana, A. (2023). Two Years Later: How COVID-19 Has Shaped the Teacher Workforce. *Educational Researcher*, 52(4), 219–229. <https://doi.org/10.3102/0013189X231153659>
- Barnes, G., Crowe, E., & Schaefer, B. (2007). The cost of teacher turnover in five school districts: A pilot study. *National Commission on Teaching and America's Future*.
- Bartanen, B., Rogers, L. K., & Woo, D. S. (2021). Assistant Principal Mobility and Its Relationship With Principal Turnover. *Educational Researcher*, 50(6), 368–380. <https://doi.org/10.3102/0013189X21993105>
- Bastian, K. C., & Fuller, S. C. (2023). Educator Attrition and Mobility During the COVID-19 Pandemic. *Educational Researcher*, 52(8), 516–520. <https://doi.org/10.3102/0013189X231187890>
- Best, N. C., Oppewal, S., & Travers, D. (2018). Exploring school nurse interventions and health and education outcomes: An integrative review. *The Journal of School Nursing*, 34(1), 14-27.
- Béteille, T., Kalogrides, D., & Loeb, S. (2012). Stepping stones: Principal career paths and school outcomes. *Social Science Research*, 41(4), 904-919.
- Bettini, E., Cumming, M. M., O'Brien, K. M., Brunsting, N. C., Rangunathan, M., Sutton, R., & Chopra, A. (2020). Predicting special educators' intent to continue teaching students with emotional or behavioral disorders in self-contained settings. *Exceptional Children*, 86(2), 209-228.
- Bisht, B., LeClair, Z., Loeb, S., & Sun, M. (2021). Paraeducators: Growth, Diversity and a Dearth of Professional Supports. EdWorkingPaper No. 21-490. Annenberg Institute for School Reform at Brown University.
- Bruno, P., Rabovsky, S. J., & Strunk, K. O. (2020). Taking Their First Steps: The Distribution of New Teachers in School and Classroom Contexts and Implications for Teacher Effectiveness. *American Educational Research Journal*, 57(4), 1688-1729.
- Borman, G. D., & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of educational research*, 78(3), 367-409.
- Boyd, D., Grossman, P., Ing, M., Lankford, H., Loeb, S., & Wyckoff, J. (2011). The influence of school administrators on teacher retention decisions. *American Educational Research Journal*, 48(2), 303–333.
- Boyd, D., Lankford, H., Loeb, S., & Wyckoff, J. (2003). Analyzing the Determinants of the Matching Public School Teachers to Jobs: Estimating Compensating

- Differentials in Imperfect Labor Markets. National Bureau of Economic Research. <https://doi.org/10.3386/w9878>
- Brummet, Q., Penner, E. K., Pharris-Ciurej, N., & Porter, S. R. (2024). After School: An Examination of the Career Paths and Earnings of Former Teachers. *Educational Evaluation and Policy Analysis*, 01623737241227906.
- Bureau of Labor Statistics, U.S. Department of Labor. (2021). National Industry-Specific Occupational Employment and Wage Estimates, May 2021 Edition. Retrieved from https://www.bls.gov/oes/current/naics4_611100.htm
- Camburn, E. M., Spillane, J. P., & Sebastian, J. (2010). Assessing the utility of a daily log for measuring principal leadership practice. *Educational Administration Quarterly*, 46(5), 707–737.
- Camp, A., Zamarro, G., & McGee, J. B. (2023). Movers, Switchers, and Exiters: Teacher Turnover during COVID-19. Education Reform Faculty and Graduate Students Publications. Retrieved from <https://scholarworks.uark.edu/edrepub/142>.
- Carver-Thomas, D. (2018). Diversifying the teaching profession: How to recruit and retain teachers of color. Palo Alto, CA: Learning Policy Institute. <https://doi.org/10.54300/559.310>.
- Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood. *American economic review*, 104(9), 2633-79.
- Choudry, M. (2022). Maryland's Teacher Workforce: Supply, Demand, and Diversity. Presentation to the Maryland State Board of Education. <https://www.marylandpublicschools.org/stateboard/Documents/2022/0726/TabGBueprintAndDataDeepDiveTeacherPipelineAndDiversity.pdf>
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). Teacher credentials and student achievement: Longitudinal analysis with student fixed effects. *Economics of Education Review*, 26(6), 673-682.
- Coburn, C. E., Russell, J. L., Kaufman, J., & Stein, M. K. (2012). Supporting sustainability: Teachers' advice networks and ambitious instructional reform. *American Journal of Education*, 119(1), 137-182.
- Darling-Hammond, L. (1984). Beyond the Commission Reports. The Coming Crisis in Teaching. The Rand Corporation, Publications Department, 1700 Main Street, PO Box 2138, Santa Monica, CA 90406-2138.
- Elfers, AM, Plecki, ML, Bei, N & Kim, Y (2020). Examining the Beginning Teacher Workforce in Washington State: An Update with a Special Focus on Teachers of Color. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.
- Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record*, 103, 1013–1055.
- Frank, K. A., Zhao, Y., & Borman, K. (2004). Social capital and the diffusion of

- innovations within organizations: The case of computer technology in schools. *Sociology of education*, 77(2), 148-171.
- Goldhaber, D., Strunk, K. O., Brown, N., Naito, N., & Wolff, M. (2020). Teacher Staffing Challenges in California: Examining the Uniqueness of Rural School Districts. *AERA Open*. <https://doi.org/10.1177/2332858420951833>
- Goldhaber, D., & Theobald, R. (2023a). Teacher Attrition and Mobility in the Pandemic. *Educational Evaluation and Policy Analysis*, 45(4), 682–687. <https://doi.org/10.3102/01623737221139285>
- Goldhaber, D. & Theobald, R. (2023b). Teacher Turnover Three Years into the Pandemic Era: Evidence from Washington State. (CALDER Policy Brief No. 32-0223). Arlington, VA: *Center for Analysis of Longitudinal Data in Education Research*.
- Ganser, T. (2002). The new teacher mentors: Four trends that are changing the look of mentoring programs for new teachers. *American School Board Journal*, 189(12), 25–27.
- Ghere, G., & York-Barr, J. (2007). Paraprofessional turnover and retention in inclusive programs: Hidden costs and promising practices. *Remedial and Special Education*, 28(1), 21-32.
- Goldhaber, D. & Theobald, R. (2023). Teacher Turnover Three Years into the Pandemic Era: Evidence from Washington State. (CALDER Policy Brief No. 32-0223). Arlington, VA: Center for Analysis of Longitudinal Data in Education Research.
- Grissom, J. A., Loeb, S., & Master, B. (2013). Effective instructional time use for school leaders: Longitudinal evidence from observations of principals. *Educational researcher*, 42(8), 433-444.
- Grissom, J. A., Viano, S. L., & Selin, J. L. (2016). Understanding employee turnover in the public sector: Insights from research on teacher mobility. *Public Administration Review*, 76(2), 241-251.
- Grooms, A. A., Mahatmya, D., & Johnson, E. T. (2021). The retention of educators of color amidst institutionalized racism. *Educational Policy*, 35(2), 180-212.
- Guarino, C. M., Santibanez, L., & Daley, G. A. (2006). Teacher recruitment and retention: A review of the recent empirical literature. *Review of Educational Research*, 76(2), 173-208.
- Hahnel, C., Barondess, H., & Ramanathan, A. (2011). Victims of the Churn: The Damaging Impact of California's Teacher Layoff Policies on Schools, Students, and Communities in Three Large School Districts. K-12 Policy. *Education Trust-West*.
- Helligso, J., & Tate, B., (2023). Initial Findings for the Legislative Taskforce on Statewide Educator Salaries. Oregon Longitudinal Data Collaborative. Retrieved from <https://olis.oregonlegislature.gov/liz/2023I1/Downloads/CommitteeMeetingDocument/279027>

- Hemelt, S. W., Ladd, H. F., & Clifton, C. R. (2021). Do Teacher Assistants Improve Student Outcomes? Evidence From School Funding Cutbacks in North Carolina. *Educational Evaluation and Policy Analysis*, 43(2), 280–304.
- Harris, D. N., & Sass, T. R. (2011). Teacher training, teacher quality and student achievement. *Journal of public economics*, 95(7-8), 798-812.
- Heubeck, E. (2022). The Latest Perk Schools Are Using to Attract Teachers: 4-Day Weeks. *Education Week*. Retrieved March 3, 2023, from: <https://www.edweek.org/leadership/the-latest-perk-schools-are-using-to-attract-teachers-4-day-weeks/2022/06>
- Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American educational research journal*, 38(3), 499-534.
- Kraft, M. A., & Papay, J. P. (2014). Can professional environments in schools promote teacher development? Explaining heterogeneity in returns to teaching experience. *Educational evaluation and policy analysis*, 36(4), 476-500.
- Kraft, M. A., Papay, J. P., Johnson, S. M., Charner-Laird, M., Ng, M., & Reinhorn, S. (2015). Educating amid uncertainty: The organizational supports teachers need to serve students in high-poverty, urban schools. *Educational Administration Quarterly*, 51(5), 753-790.
- Lieberman, M. (2022). How school staffing shortages are hurting students. *Education Week*. <https://www.edweek.org/leadership/whos-at-risk-when-schools-staffing-shortages-persist/2022/06>
- Middleton, O. (2023). The state of educator racial diversity in Massachusetts. *Massachusetts Education-to-Career Data Hub*. <https://educationtocareer.data.mass.gov/stories/s/The-state-of-educator-racial-diversity-in-Massachu/fm6k-958d/>
- Mulhern, C. (2020). Beyond teachers: Estimating individual guidance counselors' effects on educational attainment. Unpublished Manuscript, RAND Corporation.
- National Council on Teacher Quality. (2023). Policies to Increase Teacher Diversity. <https://www.nctq.org/publications/State-of-the-States-2023:-Policies-to-Increase-Teacher-Diversity>
- O.R. Legis. Assemb, HB 2690. Reg. Sess. 2023. (2023). <https://olis.oregonlegislature.gov/liz/2023R1/Downloads/MeasureDocument/HB2690/Introduced#:~:text=Requires%20school%20district%20to%20pay%20certified%20educator%20salary%20of%20not,less%20than%20%2463%2C000%20per%20year>
- Papay, J., Bacher-Hicks, A., Page, L. C., & Marinell, W. H. (2017). The challenge of teacher retention in urban schools: Evidence of variation from a cross-site analysis. *Educational Researcher*, 46(8), 434–448.
- Penner, E., Liu, Y., & Ainsworth, A. (2023). Revolving school doors? A longitudinal

- examination of teacher, administrator, and staff contributions to school churn. *Annenberg Institute for School Reform at Brown University*.
<https://www.edworkingpapers.com/index.php/ai23-777>
- Plecki, M. L., Elfers, A. M., & Wills, K. (2017). Understanding principal retention and mobility in Washington state. Seattle, WA: University of Washington Center for the Study of Teaching and Policy.
- Redding, C., & Henry, G. T. (2018). New evidence on the frequency of teacher turnover: Accounting for within-year turnover. *Educational Researcher*, 47(9), 577–593.
- Ronfeldt, M., Loeb, S., & Wyckoff, J. (2013). How teacher turnover harms student achievement. *American educational research journal*, 50(1), 4-36.
- Rogers, L. K., & Doan, S. (2019). Late to Class: Estimating the Relationship between Teacher Assignment Change and Student Sorting. *The Elementary School Journal*, 120(2), 347-371.
- Smith, T. M., & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover?. *American educational research journal*, 41(3), 681-714.
- Sun, M. (2018). Black teachers' retention and transfer patterns in North Carolina: How do patterns vary by teacher effectiveness, subject, and school conditions?. *AERA Open*, 4(3), 2332858418784914.
- Taie, S., and Lewis, L. (2022). *Characteristics of 2020–21 Public and Private K–12 School Teachers in the United States: Results from the National Teacher and Principal Survey First Look (NCES 2022-113)*. U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2022113>.
- Taie, S., and Lewis, L. (2023). *Teacher Attrition and Mobility. Results From the 2021–22 Teacher Follow-up Survey to the National Teacher and Principal Survey (NCES 2024-039)*. U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved [date] from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2024039>.
- Thompson, P. N., Gunter, K., Schuna, J., John M., & Tomayko, E. J. (2021). Are All Four-Day School Weeks Created Equal? A National Assessment of Four-Day School Week Policy Adoption and Implementation. *Education Finance and Policy*, 16 (4), 558–583.
- Wagner, D., & Layne, M. (2014). *The person identification validation system (PVS): Applying the center for administrative records research and applications' (CARRA) record linkage software* (Center for Administrative Records Research and Applications Working Paper, 1). U.S. Census Bureau.