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A Review of the Literature on Teacher Recruitment and Retention

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A Review of the Literature on Teacher Recruitment and Retention

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Teacher Recruitment and Retention

Recent years have seen growing recognition of a teacher shortage, which is shaped by issues of teacher recruitment and retention (García et al., 2022). Teachers are the most important school-level factor related to student outcomes as high-quality teachers promote higher student achievement, higher incomes in adulthood, higher rates of postsecondary attendance, and a range of other positive outcomes (Aaronson et al., 2007; Chetty et al., 2014; Rivkin et al., 2005; Rothstein, 2014; Sanders & Rivers, 1996). These outcomes highlight the importance of making sure that all students are taught by a trained and credentialed teacher. Unfortunately, though, many students do not have access to a fully credentialed teacher.

Recent years have seen growing alarm about a teacher shortage, meaning that districts and schools are not able to hire enough credentialed teachers to meet their needs. A shortage of teachers has significant implications for students and teachers as not having enough teachers to staff classrooms may force districts to adopt strategies that reduce instructional quality. Potential responses to teaching shortages include increasing class sizes, cancelling courses such as electives, asking or requiring teachers to take on additional assignments, and staffing classrooms with teachers who are not fully qualified to teach in their assigned subjects or grade levels, or even substitute teachers who lack a teaching credential (Darling-Hammond et al, 2023). While these strategies can fill otherwise vacant teaching positions, they lead to lower quality instruction overall and create conditions that make it more difficult for students to learn, thus depressing student achievement (Darling-Hammond, 1999; Sorensen & Ladd, 2020). Prolonged shortages may exacerbate these issues by creating a situation in which the shortage-induced burdens placed on teachers push some of them out of the classroom. This can make the shortage more severe and place additional burdens on remaining teachers, creating a vicious cycle that further disadvantages students (Boyd, Lankford et al., 2011; Darling-Hammond et al., 2023; Harbatkin et al, 2023; Jackson & Bruegmann 2009; Kraft & Papay 2014; Ronfeldt, Loeb, & Wyckoff 2013; Sorensen & Ladd 2020).

Teacher shortages are the product of challenges recruiting and/or retaining teachers. The notion of a shortage revolves around vacant teaching positions. Vacancies can be created by factors such as growing student enrollment that requires additional teachers, though in many cases vacancies are the result of teachers leaving their

positions. Whether teachers remain in their positions is generally measured from one school year to the next and the rate at which teachers remain in their positions is referred to as teacher retention while the rate at which teachers leave their positions is referred to as turnover. For example, if 1 in 4 teachers in a given school left between school years, that school would have a 75% retention rate and a 25% turnover rate. Teacher turnover imposes significant costs on districts who must recruit and train replacements. Filling vacant teaching positions incurs costs to advertise positions, interview and select candidates, and then onboard and train new teachers, which total approximately $21,000 per teacher on average (Carver-Thomas & Darling-Hammond, 2017; Learning Policy Institute, 2017). A recent estimate places the total annual cost of teacher turnover in the US at more than $8 billion, an increase of more than 10% from 15 years ago (NCTAF, 2007; Strauss, 2017). Along with high direct costs, teacher turnover also imposes significant opportunity costs on districts, which could otherwise deploy those resources to supporting student outcomes (García & Weiss, 2019).

So long as districts are able to recruit new teachers to fill vacancies, they will not experience a teacher shortage. In doing so, it is important that whoever districts recruit be properly trained and credentialed as a teacher. Effectively recruiting teachers requires an adequate pool of teachers available to work in a district and that these teachers be willing to work where they are needed. Districts experience recruiting challenges when there are not enough applicants for open positions or when those who do apply are not qualified for the position. For example, a school would experience a recruitment challenge if it posted a job for a special education position and either received no applicants or received 10 applications but none from a candidate who is a licensed special educator. In this way, recruitment issues work in tandem with retention issues to create teacher shortages.

In this review, we begin by discussing general patterns and trends in the teacher shortages across the country and in Michigan specifically. Next, we analyze how teacher shortages vary across school, district, and teacher characteristics. We then discuss the research on factors that shape teachers' decisions about where they choose to work and whether they choose to leave their school. This review is guided by the following questions:

1. How large is the teacher shortage in the United States and in Michigan?
2. How does teacher recruitment and retention vary across school and district contexts, and across teacher characteristics?
3. What factors shape teachers' decisions to enter and leave schools?

Throughout the review, we present key takeaways for practitioners and policymakers.

RECENT TRENDS IN TEACHER SHORTAGES

Though concerns about a teacher shortage have been raised for some time (Sutcher et al., 2016), the years following the COVID-19 pandemic have brought much greater attention to the issue (Carver-Thomas et al., 2021; Darling-Hammond et al., 2023; Nguyen et al., 2022). In this section, we discuss macro-level trends in the teacher shortage across the United States and in Michigan.

National Teacher Shortage Trends

The teacher shortage has become more pronounced in the years following the COVID-19 pandemic. As of the 2017-2018 school year, the US teacher shortage was estimated to be 112,000 teachers (Sutcher et al., 2019). Since then, the teacher shortage has grown by more than 50% to 172,000 teachers as of the 2021-2022 school year. This most recent figure includes 136,000 teaching positions that are filled by underqualified teachers who are not certified in the area they are teaching, and an additional 36,000 vacant teaching positions (Nguyen et al., 2022; Darling-Hammond et al., 2023). The current shortage is driven by a combination of recruitment and retention issues. Leading up to the pandemic, teacher turnover varied between 6% and 8% each year. That increased sharply in the 2021-2022 school year when turnover spiked to more than 10% (Diliberti & Schwartz, 2023; Sutcher et al., 2019). To underscore the magnitude of this issue, the recent change in turnover represents a relative increase in turnover of 25-60%. Recruitment is more difficult to measure as there is little data available on the number of teaching positions, the number of applications to those positions, or the qualifications of applicants. However, there is evidence that recruitment challenges are mounting as enrollment in teacher preparation programs has declined by more than one-third between 2008 and 2019 (Darling-Hammond et al., 2023), meaning that there are now fewer candidates than before to fill vacant teaching positions. Importantly, teacher shortages are evident in all states, though there is variation in the extent and nature of state-level shortages.

Teacher Shortage Trends in Michigan

In Michigan, the patterns of teacher shortage in many ways reflect the national trend, though there are important differences. Some elements of Michigan's teacher shortage are difficult to examine because of the way that vacancies are documented, which likely leads to undercounting of vacancies (Kilbride et al., 2021). Notwithstanding that, Michigan school districts reported 1,228 vacant full-time equivalent teaching positions in 2021-2022, which is 40% higher than the previous year and more than double the number of vacancies in each of the years from 2012-2017 (Kilbride et al, 2023). Though more accurate reporting is likely responsible for a portion of this increase, a survey of district leaders found that districts experienced significantly more vacancies in the 2022-2023 school year compared with the 2019-

2020 school year, suggesting that the increase in reported vacancies reflects a growing shortage in Michigan (Kilbride et al, 2023; Torres et al., 2023).

Michigan's teacher shortage is reflective of both increased teacher attrition and decreased teacher recruitment. One area where Michigan differs from other parts of the country is that teacher transfers to other schools in the same district, or to schools in another district, decreased in recent years (Hopkins et al, 2021; Kilbride et al, 2023). At the same time, the number of teachers exiting their district has increased by more than 60% in recent years, climbing from a district exit rate of 5.2% in the 2010-2011 school year to 8.7% in the 2019-2020 school year (Hopkins et al, 2021). This means that when Michigan teachers leave their schools, they are increasingly likely to be leaving the profession rather than transferring to another teaching position.

At the same time that some measures of teacher retention are decreasing in Michigan, fewer teachers are entering the profession, which has diminished the pool of teachers that districts may hire. In the period from 2012 to 2021, the overall number of teachers leaving the profession exceeded the number of newly certified teachers, with only the years from 2017 to 2020 seeing the number of new teachers exceed the number of exiting teachers (Kilbride et al., 2023). Since 2012, the number of teachers issued an initial certificate has decreased significantly, though there was an increase from the 2016-2017 school year through the 2019-2020 school year. In 2021-2022, the number of teachers receiving initial certificates was nearly half as many as in 2012-2013 and was 17% lower than the recent peak in 2019-2020 (Kilbride et al., 2023). An important part of this trend is declining enrollment in teacher preparation programs in Michigan. Between 2012-2013 and 2019-2020, enrollment in teacher preparation programs decreased by more than 30% and the number of students completing teacher preparation programs decreased by nearly 50% (Kilbride et al., 2023; Slagter, 2022). However, teacher preparation program enrollment did increase between 2016-2017 and 2019-2020, suggesting that teacher recruitment may improve in the coming years (Kilbride et al., 2021). Fewer teachers entering the profession has both created and accentuated teacher shortages in Michigan. District leaders report that whereas in the past they would receive dozens, or even hundreds, of applications for teaching positions, they now sometimes receive only a handful, or even none at all. Moreover, for the candidates who do apply to teaching positions, leaders perceive that the average quality of applicants has declined in recent years (Torres et al., 2023).

Recruiting challenges appear to be particularly acute in Michigan as Michigan ranks 40th out of the 50 states plus Washington D.C. in terms of reported difficulty filling vacant teaching positions (Learning Policy Institute, 2023). The smaller size and lower quality of the pool of prospective teachers have increasingly led districts in Michigan to fill teaching positions with non-certified staff such as long-term substitute teachers or teachers who are not certified to teach in their content area. For example, the number of full-year substitute teaching permits in 2021-2022 was nearly double the number issued in 2019-2020 and more than three times the number issued in 2017-

2018 (Kilbride et al., 2023). In other cases, districts are turning to virtual teachers, which could be used to expand course offerings such as electives, but may also be used by districts to fill vacant positions. As of 2021-2022, 3% of teachers in Michigan were classified as virtual teachers (Kilbride et al., 2023).

A significant body of research reveals a long-running teacher shortage across the United States that has become more acute in recent years. Michigan's trend of increasing teacher exits, growing teacher vacancies, and declining teacher preparation program enrollment parallel the nation as a whole in these metrics. However, it appears that districts in Michigan may experience more pronounced difficulties in filling vacant teaching positions, which, if not addressed, could have significant consequences for Michigan's children.

TEACHER RECRUITMENT AND RETENTION ACROSS SCHOOL/DISTRICT AND TEACHER CHARACTERISTICS

Rather than being a monolithic phenomenon, the teacher shortage is more severe in certain kinds of places and more severe for certain kinds of teachers. In this section, we discuss recruitment and retention challenges based on school and district characteristics before turning to a discussion of how these challenges vary across teacher characteristics.

School and District Characteristics

The extent of recruitment and retention issues varies markedly across different kinds of schools and districts. Here, we review research on how these challenges are shaped by the factors of urbanicity and poverty.

The Role of Urbanicity: Teacher Recruitment and Retention Challenges in Urban and Rural Settings

Urbanicity refers to the population density of a community, which is then related to the kinds of amenities and services that may be available in an area, as well as the social dimensions of an area. Urbanicity is often defined as the "locale" of an area, which can be urban, suburban, town, or rural. Both urban and rural areas face unique challenges around teacher recruitment and retention. Below, we review evidence on this, paying particular attention to issues faced by rural schools given that a large proportion of Michigan is classified as rural.

Recruitment and Retention in Urban Settings

It is well-documented that urban districts experience acute challenges recruiting teachers to work in their schools as well as retaining their teachers. Given that these

issues are well-known, we discuss recruitment and retention in urban schools and districts here only briefly before turning to the challenges of rural districts and schools, which are less understood. Urban districts tend to have a smaller pool of prospective teachers relative to their needs, meaning urban districts face challenges filling vacant teaching positions. This is especially the case in certain subject areas like math and science (Jacob, 2007). In the face of greater hiring challenges, urban districts are more likely to hire less qualified teachers such as substitute teachers, novice teachers, teachers without certification in their subject area, or teachers who demonstrated lower achievement (Bastian et al., 2013; Lankford et al., 2002).

Recruitment and Retention in Rural Settings

Rural districts also face context-specific challenges in recruiting and retaining high quality teachers in their schools, which serve 20% of students in the US and 21% of students in Michigan (Drescher et al., 2022; Gardner, 2022; Ingersoll & Tran, 2023)). Principals and superintendents in rural areas report having significantly smaller recruitment pools and struggling to find teachers to fill positions (Curtin, 2018; Lazarev et al., 2017). While there is consistent evidence that teachers with rural backgrounds are more likely to teach in rural schools (Curtin, 2018; Lazarev et al., 2017; Oyen & Schweinle, 2020), they alone do not meet the teaching needs of rural communities. Yet, rural areas struggle to attract and retain teachers from non-rural backgrounds because of their distance from urban centers and the amenities they offer (including access to healthcare, shopping, and entertainment), the social and geographic isolation of rural life, the cost of transportation to rural schools, a dearth of school resources resulting from a lower tax base in rural communities, less separation between work and life within small towns, and a lack of diversity among students and staff (Cowen et al., 2012; Irvin et al., 2020; Kaden, et al., 2016; Monk, 2007; Oyen & Schweinle, 2020; Tran et al., 2020). Relatively lower teacher salaries, as compared to suburban and urban areas, also contribute to teacher shortages in rural schools. However, teachers in rural areas tend to stay longer and, in some areas, have reported higher rates of job satisfaction, suggesting that teacher pay does not fully capture teachers' motivations to work in rural schools (Irvin et al., 2020). Just the same, those that do leave rural teaching positions report that low salaries contribute to their decisions to leave (Lazarev et al., 2017). Additionally, rural districts tend to be smaller in size, which may require teachers to have multiple endorsements, cover multiple subject areas, and even teach in more than one school (Irvin, et al., 2020). As a potential result of these varied challenges, rural teachers tend to be less highly qualified, with higher rates of teachers on emergency credentials (two times higher than in urban schools, and three times higher than in suburban schools) and about 10% fewer teachers holding master's degrees as compared to suburban districts (Goldhaber, et al, 2020; Irvin et al., 2020).

For all these reasons, the challenges of teacher recruitment and retention are particularly pronounced in rural parts of Michigan, which constitute 94% of the state's

land and are home to 20% of the state's population (Gardner, 2022). Indeed, district leaders across rural Michigan are highly cognizant of the lack of qualified teachers in their communities (Mauriello, 2023; Mauriello & Higgins, 2022; Slagter, 2022). Sault Ste. Marie Public Schools in the Upper Peninsula, for example, has seen a 38% decline in teacher staffing since 2018. Superintendent Amy Scott-Kronemeyer explains that it is hard to attract candidates to the UP, especially for CTE positions: "The demand, the intensity, the way teachers sometimes are treated today, makes it not as appealing" (Slagter, 2022). Superintendent Michael Behrmann from Harbor Springs in the northern Lower Peninsula describes a similar situation in his district: "Fifteen years ago we'd get hundreds of applications for an elementary position, now we're lucky if we get three or four" (Mauriello & Higgins, 2022). These sentiments are echoed from superintendents across northern Michigan, illustrating the urgent need to resolve the teacher shortage in rural Michigan (George, 2021).

Recruitment and Retention Challenges in High-Poverty Areas

Across both urban and rural settings, schools with more than 75% of students receiving free or reduced-price lunch – denoted as "high-poverty schools" - often face the most significant challenges in recruiting and retaining high quality teachers (NCES, 2023a). In the US, these high-poverty schools constitute more than one-third of all public schools and serve about 10.5 million students, including 38% of Latiné students, 37% of Black students, and 30% of Indigenous students (Ingersoll, et al., 2021; NCES, 2023a). In Michigan, teacher retention data reveal that high-poverty schools have the highest teacher turnover rates, with 2019-2020 exit rates of 12.7%, compared to just 6.9% in schools with fewer than 25% of students receiving free or reduced-price lunch (Hopkins, et al., 2021). These statistics make the teacher shortage in high-poverty schools a critical racial and socioeconomic equity issue.

A sizable body of research finds that much of the high turnover in high-poverty schools is due to poor working conditions that are common – although not universal – in high-poverty schools (Simon & Johnson, 2015). Research finds that a big part of why teachers take jobs in high-need areas in the first place is because they want to make a difference (Simon, et al, 2015). Indeed, research-based recommendations for attracting teachers to high-poverty schools advise districts to appeal to teachers' sense of mission and purpose (Shuls & Maranto, 2014), and programs like Teach for America demonstrate both that high-poverty schools can attract "top talent" and that many teachers are driven by a "humanist commitment" to teaching in underserved communities (Simon et al., 2015). Yet, scholars find that teachers only stay in high-poverty schools when they feel successful with their students, an outcome that is strongly linked to the quality and nature of their experiences at the school – including their perceptions of their principal, their feelings about their relationships with colleagues (such as the level of interpersonal trust and the extent to which teachers share a commitment to students), elements of the school culture (including whether the school provides a safe and supportive learning environment for students), and the nature and extent of support offered to new teachers (Allensworth, et al., 2009; Ladd,

2011; Simon & Johnson, 2015). The critical role of working conditions in teacher retention is further examined later in this review. But, in many high-poverty schools, persistently high levels of teacher and leader turnover create a cyclical problem, such that the organization lacks the stability necessary to improve organizational conditions over time (Simon & Johnson, 2015).

Teacher Characteristics

Another dimension of teacher recruitment and retention is that challenges vary for specific kinds of teachers or teachers with specific backgrounds. In particular, teacher shortages are more pronounced in certain subject areas, there is a shortage of teachers of color, and there is a shortage of more credentialed and qualified teachers where they are needed most. Below, we review research on hard-to-staff subject areas, recruitment and retention issues for teachers of color, and recruitment and retention for more qualified and credentialed teachers.

Hard-to-Staff Subject Areas

Teacher shortages are more significant in certain subject areas, notably in special education and STEM subjects (science, technology, engineering, and math) (Darling-Hammond et al., 2023). The shortage of special educators in many places is the most severe of all subjects and grade areas, which is particularly concerning given that these teachers work with perhaps the student population most in need of high-quality, certified teachers (Sutcher et al., 2019; Ulbrich & Pritchett, 2021). One factor that complicates special educator recruitment is that the field requires a broad set of knowledge that draws on psychology and medicine to understand students' needs and on content and pedagogy to support student learning (Sutcher et al., 2019). These demands may make special education comparatively more difficult than some other teaching positions, creating additional stress that leads special educators to leave their positions (Billingsley & Bettini, 2019), and may discourage some from pursuing a career in special education in the first place. In Michigan, the number of newly certified special educators decreased by more than 30% from 2012 to 2019, with decreases evident in each year except 2018-2019 (Kilbride et al, 2021). One interesting element of retention for special educators is that when they leave, they are more likely to take on a different role in their school, or in another school, than to leave the profession, which has been observed in the research on special educator recruitment and retention generally as well as within the Michigan context (Billingsley & Bettini, 2019; Harbatkin et al., 2023). As a result, additional compensation may be needed to offset the added demands of their work and encourage more people to become special educators (Billingsley & Bettini, 2019; Peyton et al., 2021).

A long-noted factor in the shortage of STEM teachers is that the content knowledge required to teach these subjects is also in demand within the broader labor market where one may obtain a higher salary (Sutcher et al., 2019). This means that someone who has the knowledge to teach a subject like chemistry could earn more money by

working in an industry that requires knowledge of chemistry, such as pharmaceuticals, than by being a chemistry teacher. This phenomenon likely makes it more difficult to attract people to pursue a career as a teacher in a STEM subject, and it also means that STEM teachers have more, and likely higher-paying, employment opportunities that may entice them to leave their positions. This is evident in longstanding and widespread shortages of STEM teachers (Sutcher et al, 2019) that stem from a declining number of newly certified STEM teachers and an increased likelihood that STEM teachers leave their classrooms. In Michigan specifically, the shortage may be most severe for STEM teachers (Kilbride et al., 2023), with one leader noting that "finding somebody who is a high school or a middle school science teacher or chemistry teacher seems to be like finding a unicorn right now. I would say math is the next one" (Torres et al., 2023, pp. 44). The number of new math and science teachers in Michigan decreased significantly in the decade from 2012 to 2021. The number of newly certified math teachers decreased each year during the period, declining 60% in total; while the number of science teachers declined a total of more than 50% (Kilbride et al., 2023). STEM teachers in Michigan are also more likely than teachers in other subjects to leave their position if they form an intent to do so (Harbatkin et al., 2023).

There is emerging evidence that Michigan may also be experiencing a shortage of elementary school teachers. Between the 2017-2018 and 2021-2022 school years, the number of full-year substitute teacher permits increased more than seven-fold and certain parts of the state have started to rely more on under-credentialed teachers to staff elementary classrooms, with shortages concentrated in the rural areas of the upper peninsula, the northern lower peninsula, and areas in southern Michigan near the Ohio and Indiana borders (Kilbride et al., 2023).

Teachers of Color

Since the 1980s, educational practitioners, policymakers, and researchers have been concerned about the need to recruit and retain large numbers of teachers of color throughout the US. With students of color constituting an increasingly larger proportion of the nation's K-12 student population (55% as of fall 2021), the need to increase the proportion of teachers who reflect students' racial, ethnic, and cultural characteristics has persisted (Ingersoll, et al., 2021; NCES, 2023b). In response, many policies and programs have focused on recruiting more people of color into teaching, and such programs have largely been successful. The proportion of US teachers who are people of color increased from 12.5% in 1988 to 20% in 2018 (Ingersoll, et al., 2021). The overall size of the US teaching force also increased during this 20-year period, such that these proportions mask a sizable national increase of 248% from approximately 327,000 teachers of color in 1988 to over 810,000 teachers of color by 2018 (Ingersoll, et al, 2021). Indeed, during these years, teachers of color entered the profession at significantly higher rates than white teachers. Yet, a large gap remains between the percentages of teachers of color (20%) and students of color (55%) in the US. In Michigan, the proportion of teachers who are people of color is even lower, at

only 9.4% as of 2021 (Hopkins, et al., 2021), while 36% of Michigan students are students of color (Michigan Department of Education, 2023). Further, teachers of color have higher turnover rates than white teachers, with research showing that factors driving them from the profession include antagonistic work cultures, feeling undervalued despite taking on high levels of responsibility, feeling unable to tailor their teaching to their students, and finding their working conditions unfavorable (Dixon, et al., 2019). Additionally, because teachers of color often teach in urban communities and high-poverty schools, they face the many retention challenges detailed in the sections above on urban and high-poverty schools (Ingersoll, et al., 2021). Collectively, statistics and research illustrate the need for continued efforts to recruit teachers of color alongside intentional efforts at retaining teachers of color (Carver-Thomas, 2018; Cooc & Kim, 2022; Ingersoll, et al., 2021).

The large, persistent difference in the percentages of students of color and teachers of color is problematic because the benefits of racial diversity in the teaching profession have been well researched. One key finding across several studies is that students assigned to teachers of the same race or ethnicity as themselves tend to perform better than those assigned to teachers of another race or ethnicity. This holds true for subjective assessments, where grades can be influenced by teachers' implicit biases (Ehrenberg et al., 1995; Gershenson et al., 2016) and for objective assessments such as statewide standardized testing (Dee, 2004; Egalite et al., 2015). Outside of academic achievement, students assigned to teachers of the same race or ethnicity may view their teachers as more caring, interested in their future, and as having higher expectations of them (Gershenson et al., 2016; Egalite & Kisida, 2018). Furthermore, being assigned to a teacher of another race or ethnicity corresponds with increased unexcused absences and suspensions, with the high likelihood of being suspended being "almost entirely driven by nonwhite male students in classrooms taught by white teachers" (Holt & Gershenson, 2015). These gains are not exclusively limited to students of color. White students also benefit academically from increases in teacher workforce diversity, and White and Asian students have been found to perceive Black and Latiné teachers more favorably than White teachers across all metrics (Meier et al., 1999; Cherng & Halpin, 2016).

Recruiting more teachers of color can also yield more positive organizational outcomes as well. Because teachers of color are more likely to teach in high-poverty and urban schools, recruiting more teachers of color may help to alleviate shortages these school districts face (Carver-Thomas, 2018; Ingersoll et al., 2019; Ingersoll et al., 2022). Relatedly, increasing the numbers of teachers of color in schools where they make up small proportions of the workforce may reduce their turnover, perhaps due to feelings of improved satisfaction and reduced feelings of isolation (Carver-Thomas & Darling-Hammond, 2017; Carver-Thomas, 2018). Such reduction in turnover could also increase organizational stability, thereby allowing for more focused attention and progress in improving working conditions and organizational outcomes.

Credentials and Effectiveness

Addressing the teacher shortage means not only recruiting and retaining teachers generally, but highly qualified and more effective teachers, which is especially pressing given the significant learning disruptions brought on by the COVID-19 pandemic. Importantly, how "qualified" and "effective" are defined has evolved over time from a focus on observable teacher characteristics such as credentials in the past toward an emphasis on outcomes-based measures of student growth in recent years.[i] As a result, research that aligns with the current conception of how to identify effective teachers is more limited. Here, we review more recent evidence on recruitment and retention of teachers with stronger qualifications or who are more effective along with some earlier work that remains relevant to the issue.

Overall, the evidence is mixed on whether higher-quality teachers are more likely to turn over than other teachers. Teachers with stronger credentials, such as the selectivity of their undergraduate institution and performance on teacher certification exams, do appear more likely to leave their school (Boyd, Lankford et al., 2005; Goldhaber et al., 2011; Lankford et al., 2002; Podgursky et al., 2004). An important factor in this pattern is that teachers with stronger credentials are more likely to be successful when searching for jobs in other schools (Boyd, Lankford et al., 2011). Though research focusing on observable teacher credentials shows that more qualified teachers are more likely to turn over, research examining the turnover of teachers who are more effective at raising student outcomes (i.e. achievement) challenges whether the "best" teachers are more likely to leave. Teachers who turn over tend to have more credentials, but are, on average, less effective than teachers who remain in their positions (Boyd, Lankford et al., 2011; Goldhaber et al., 2011; Hanushek et al., 2005). However, there is some important nuance on this point. For instance, early career teachers who transfer to a new school tend to be more effective than the teachers who remained in their school (Hanushek & Rivkin, 2010). Additionally, research that considers the role of effectiveness in teacher turnover tends to consider effectiveness in the year immediately prior to a teacher leaving, which could be confounded by a teacher's intent to leave. Examining effectiveness two years before teachers turn over shows that they are only less effective in the school year immediately before they leave (Hanushek et al., 2005). This suggests that lower effectiveness in the year before leaving may not be representative of their overall skills but rather the product of factors such as reduced effort after a teacher decides to leave or a change in a teacher's personal life (e.g. death in the family, divorce, etc.) that impacts both their performance and intention to remain in their position. Finally, the extent to which more effective teachers are aware of their effectiveness may make them more likely to leave their position. After a policy change in North Carolina

[i] For a more thorough discussion of this topic, we refer readers to the companion of this review on how "high-impact" teachers may be defined.

provided teachers with additional data on their effectiveness, more effective teachers in schools that faced greater challenges tended to this information to secure a job in a more desirable school, potentially decreasing teacher quality in hard-to-staff schools (Bates, 2020).

Takeaways

Two important facets emerge as crucial to understanding and addressing the teacher shortage in Michigan and the rest of the country. The first is that shortages are largest in certain kinds of districts. These include rural districts, urban districts, and districts that serve a large share of students who are economically disadvantaged. The second facet is that while there is an overall shortage of teachers, there are greater shortages of certain kinds of teachers. Providing a high-quality education to all students will require more STEM and special education teachers, more teachers of color, and more highly effective teachers. Recruiting and retaining these teachers in the places they are needed most will require a multi-pronged effort to: encourage more young people to pursue a career in education; make teaching more attractive in urban and rural schools; make teaching a more attractive career for people of color; retain teachers already working in hard-to-staff settings; and to both retain highly effective teachers and develop more teachers to become highly effective.

FACTORS THAT SHAPE TEACHERS' DECISIONS ABOUT WHERE TO WORK

Teacher shortages occur at least in part because teachers prefer to work in certain kinds of schools over others, which then influences the set of schools and districts into which they can be recruited and whether they are retained in those positions over time. Though there are many things that shape teachers' employment decisions, we identify two sets of factors that exert a strong influence on where teachers choose to work, and in turn produce the teacher shortage. The first is that teachers prefer to work in a school that is familiar to them in terms of distance from home and urbanicity. The second is that teachers prefer to work in schools that have a more positive work environment in terms of working conditions, leadership, and pay.

Teachers Prefer to Work in Familiar Schools

In the case of teachers, there is not a single labor market, but rather a set of more localized labor markets, which tend to be smaller than the labor markets for college graduates more generally (Reininger, 2012). This means that when looking for work, teachers tend to consider a smaller geographic area than people in other industries. Teachers have a strong preference to work in places where they have personal connections. One such connection is where they grew up. A longitudinal study of teachers in New York showed that 34% of teachers took their first teaching position in

the district where they attended high school, 60% took their first teaching position within 15 miles of where they attended high school, and 85% of teachers took a position within 40 miles of where they attended high school (Boyd et al., 2005a). National patterns in teachers' work locations reflect these figures. Across the United States, the median distance between teachers' hometown and place of work is 13 miles, which is approximately 75% shorter than the median distance for other college graduates (Reininger, 2012). This appears to be driven at least in part by a greater likelihood that those interested in remaining close to their home select into teaching as a career (Reininger, 2012).

Along with preferring to work closer to home, teachers tend to work in districts that have the same level of urbanicity as the school they attended themselves (Boyd et al., 2005a). That is, teachers who graduated from suburban high schools prefer to work within a relatively small radius of that school, and within that radius tend to work in schools that are also suburban. Across all levels of urbanicity, two-thirds of teachers tend to find such matches in their first teaching position (Boyd et al., 2005a). This pattern creates issues for urban districts because urban districts do not produce enough teachers to meet their needs (Boyd et al., 2005a; Hanushek et al., 2004). Geographic preferences also shape teachers' employment decisions after taking their first teaching position as teachers tend to transfer closer to where they grew up and into districts that resemble the urbanicity of the districts they attended, which in practice means that urban districts struggle to retain their teachers (Boyd et al., 2005a; Hanushek et al., 2004).

Another geographic factor driving teachers' decisions about where to work is where they attended college (Boyd et al., 2005a; Fowles et al., 2014; Reininger, 2012). In New York, for those whose first teaching position was not close to home, slightly less than half took their first teaching job within 40 miles of their teacher preparation program (Boyd et al., 2005a). This is similar to Michigan, where slightly more than 50% of first-year teachers accept a job within 30 miles of the main campus of their teacher preparation program (Kilbride et al., 2023). This suggests that, in the long-term, recruitment issues are related to whether K-12 students in different settings take an interest in teaching as a career.

Teachers Prefer Schools With a More Positive Work Environment

A teacher's day-to-day experiences are shaped by their interactions with students and families, relationships with colleagues, and the direction and support they receive from administrators. To the extent that teachers experience higher levels of these factors, they have more positive working conditions that promote a positive working environment in which they feel a sense of community, support, and success. This leads them to form stronger attachment to their work, and so they are less likely to leave their position. At the same time, more fraught relationships and lower levels of

support from leadership create a more challenging work environment that encourages teachers to leave. Independent of these factors, teachers' compensation also plays a significant role in their employment decisions. In this section, we review how working conditions, leadership, and compensation shape teachers' employment decisions.

Working Conditions

Research on teacher retention conceptualizes teachers' working conditions as the physical, psychological, and social dimensions of their school environment. Working conditions can include such factors as the physical state of the school building and the teachers' classroom, the psychological experiences of stress or support, and the nature of teachers' social relationships and interactions with colleagues, leaders, students, and families (Johnson, et al., 2012). Research shows that all these contextual dimensions predict teacher retention, such that teachers are more likely to stay in schools in which they perceive positive working conditions in these domains. For example, Ladd (2011) found that 60% of teachers' intentions to leave their school were explained by their perceptions of the working conditions. The finding that working conditions predict retention has been found repeatedly in studies throughout the US and in Michigan specifically (Harbatkin et al., 2023). It is thus of concern is that a series of reforms in 2011 and 2012 that restricted teachers' ability to collectively bargain over some elements of their working conditions such as observations and evaluations, length of the school year, and some elements of compensation increased turnover for early career teachers in hard-to-staff schools (Brunner et al., 2019).

Along with noting the overall importance of working conditions, research has also parsed out which factors matter the most for teacher retention. Findings show that teachers generally gravitate toward environments where they can create successful learning opportunities for their students, such as well-resourced schools with strong instructional leaders, committed colleagues to learn with and from, and robust instructional supports (Darling-Hammond, 2010). In a study in Massachusetts, Johnson and colleagues (2012) found that social conditions are the most critical for teachers, such that collegial relationships with colleagues, supportive principal leadership, and a school culture of trust, respect, openness, and commitment were the strongest predictors of teachers' job satisfaction and their plans to stay at their school. In a large mixed methods study in North Carolina, Berry and colleagues (2019) found that teachers' perceptions of professional learning, collaboration, student conduct, parent engagement, and community support were most positively associated with their retention. In a survey of Tennessee teachers working in the lowest 5% performing schools in the state (Viano et al., 2021), teachers expressed preferences for schools with small class sizes, high-quality professional development, and safe learning environments. Other specific dimensions of working conditions that have emerged as predictive of teacher retention include student disciplinary policies, expectations for working outside of the school day, the amount of planning time, and

instructional autonomy (Achinstein et al., 2010; Guarino, et al., 2004; Johnson, 2006; Johnson & Birkeland, 2003; Johnson et al., 2012; Johnson et al., 2016; Ladd, 2011; Simon et al., 2019; Viano et al, 2021).

Leadership

Among all working conditions that predict teacher retention, none is as critical as the quality of school leadership. In study after study across the US and in Michigan, teachers' perceptions of their school leaders – including the extent to which teachers perceive their principals as effective, feel supported by their school leader, feel included in school decision-making about issues like curricula and student discipline, and perceive that leaders see them as expert professionals – are consistently among the strongest predictors of teacher retention (Berry et al., 2019; Boyd & Lankford et al., 2011; Burkhauser, 2017; Geiger & Pivovarova, 2018; Harbatkin et al., 2023; Donaldson & Johnson, 2011; Johnson et al., 2012; Ladd, 2011; Petty et al., 2012). Indeed, Grissom and Bartanen (2019) found that more effective principals (as measured by performance reviews conducted by district superintendents or another leader and by teacher survey data) lead schools with lower rates of teacher turnover. Among effective principals, teacher turnover is higher for less effective teachers and lower for more effective teachers. This study highlights school leaders' "strategic retention" of teachers based on teacher performance. Evidence of this pattern was strongest in low-poverty, suburban contexts.

Pay

Teachers Prefer to Work in Places With Higher Pay

All else equal, teachers prefer to work in school districts with higher pay and better benefits (Berry et al., 2019; Emma White Research LLC, 2021; Guarino et al., 2004; See et al., 2020; Viano et al., 2021). There is also evidence to support the theory of "compensating differentials," such that higher pay can compensate for more challenging working conditions or other unattractive job characteristics in teachers' calculations of where to work (Milanowski et al., 2009). For example, schools in undesirable locations or with high concentrations of students who may be viewed as difficult-to-teach may need to offer higher salaries than other schools to overcome these potential hiring barriers (Kolbe & Strunk, 2012). For retention, schools may need to offer a compensating differential in the form of higher pay to teachers with employment opportunities outside of education to reduce the opportunity costs of continuing to teach over pursing other career options (Kolbe & Strunk, 2012). Providing additional compensation may be both more effective and more cost effective if it is targeted towards more effective teachers, teachers in hard-to-staff subject areas, and teachers in hard-to-staff schools.

Financial Incentives Can Shape Teachers' Employment Decisions

Drawing on the theory that paying teachers more can directly make teaching more attractive, a number of interventions have been developed to improve teacher

recruitment and retention using monetary incentives. Studies of these interventions suggest that these approaches do have the ability to improve teacher recruitment and retention, though their impact varies across contexts and the structure of the incentive scheme (Feng, 2020). Here, we discuss evaluations of programs that involved general salary increases along with targeted incentives for teachers in hard-to-staff subjects and teachers in hard-to-staff schools.

Salary increases involve raising teachers' baseline compensation, which could be implemented broadly across a district or be more targeted to specific kinds of teachers or to specific schools. Raising teachers' base pay can help to make teaching more competitive relative to other fields of employment (Kolbe & Strunk, 2012). Increasing salaries may also be attractive to teachers because it represents a long-term commitment from the district in that higher pay will be sustained over time. On the other hand, salary increases may be more costly in the long run relative to other incentive structures because they represent increases not only in salary, but potentially in retirement contributions. San Francisco Unified School District (SFUSD) experimented with salary increases by $500-$6300 depending on whether a teacher worked in a hard-to-staff school and how long they had been teaching. Importantly, these increases exceeded salary increases in nearby districts (Hough & Loeb, 2013). In response, SFUSD both received more applicants to open teaching positions and received stronger applicants on average, which translated into more effective new hires (Hough & Loeb, 2013). Permanent salary increases can increase retention as well as promote teacher recruitment. In a study that examined teachers in Texas over a more than 15-year period, higher base pay was associated with increased retention, with a base pay increase of 1% reducing turnover by 1.4%, though effects were concentrated among less experienced teachers (Hendricks, 2014). As part of a set of interventions, the District of Columbia Public Schools (DCPS) provided permanent salary increases to teachers who earned the district's highest effectiveness rating in consecutive years, with greater increases if teachers either worked in, or transferred to, harder to staff schools which, in some cases, could increase teachers' base compensation by as much as $27,000 per year (Dee & Wyckoff, 2015). While this intervention did lead to improved teacher quality across the district and encouraged the least effective teachers to leave the district, it did not increase retention among highly effective teachers (Dee & Wyckoff, 2015).

Targeted incentives generally involve additional compensation for teachers in the form of bonuses contingent on continued employment. Targeted incentives can be offered to teachers for multiple years but stop either after some predetermined period of time or once funding allocated for them is exhausted. One way that targeted incentives can be structured is to focus on teachers in subject areas or grade levels that face greater recruitment and retention issues. One such intervention in North Carolina provided a retention bonus of $1800 to teachers certified in math, science, and special education, which reduced the turnover of these teachers by 17% (Clotfelter et al., 2008). In Florida, a long running program provided incentives for teachers in

hard-to-staff areas in the form of loan forgiveness and later included recruitment and retention bonuses in these areas (Feng & Sass, 2018). Teachers could receive a bonus of up to $1200 per year and could receive loan forgiveness for up to 4 years with a maximum of $5000 per year or $10,000 over 4 years, though in practice payouts varied depending on the number of teachers who applied for a fixed funding allocation from the state legislature. There, the loan forgiveness component of the program reduced teacher turnover by more than 10% for math teachers, approximately 9% for science teachers, and by more than 12% for special education teachers. Additionally, the bonus component of the program decreased teacher turnover by more than 30% over the short run. Importantly, though, the effectiveness of both loan forgiveness and bonus payments were significantly less in years when there were reduced payments (Feng & Sass, 2018).

Targeted incentives can also be designed to encourage teachers to work in hard-to-staff schools, such as schools in urban or rural areas, or lower-performing schools. In practice, most interventions tend to target low-performing schools. Studies of targeted incentives in these schools tend to show that they can increase recruitment and retention, but that effects fade rapidly once bonus payments cease. In Tennessee, high-performing teachers were offered a bonus of $5000 to work in one of the state's lowest-performing schools. Across all teachers, the bonuses had no effect on teacher retention. However, for teachers in "tested" grades and subject areas, receiving a bonus made them 20% more likely to remain in their school (Springer, Swain, & Rodriguez, 2016). Additionally, schools that offered bonuses experienced greater achievement gains in later years (Swain et al., 2019). An initiative in California offered $20,000 in the form of a scholarship to academically talented (higher achieving) students in teacher training programs on the condition that they work in a low-performing school for at least 4 years after certification. This initiative increased recruitment in low-performing schools, but once teachers concluded their 4-year commitment to teach in a low-performing school they turned over at the same rate as teachers who did not receive the fellowship (Steele et al., 2010). These findings parallel those of a multi-state program that used annual bonuses of $10,000, which could be earned for up to 2 years, to recruit highly effective teachers into low-performing schools. One challenge noted in this study is that relatively few teachers were interested in the program, with only 5% of eligible teachers choosing to transfer to a new school and receive a bonus (Glazerman et al., 2013; Protik et al., 2015). Here, too, incentives increased the recruitment of more effective teachers into low-performing schools, but the effect faded once teachers were no longer eligible for a bonus (Glazerman et al., 2013).

The research on teacher pay and incentives suggests several factors that are important for the success of policies aimed at improving teacher recruitment and retention. First, incentives can improve teacher recruitment and retention, but effects fade once teachers no longer receive additional compensation. Increased base pay is more strongly associated with greater recruitment and retention while programs that

temporarily increase teacher compensation see retention decrease to baseline levels once additional payments stop. Second, larger bonuses are likely to be more effective. Studies that examine teachers' preferences around pay and working conditions suggest that bonuses may need to be quite high, potentially as much as $10,000, to bring retention in hard-to-staff schools up to the retention level of average schools (Berman & DeFeo, 2023; Clotfelter et al., 2011; Feng, 2009; Lazarev et al., 2017).

TAKEAWAYS

Resolving the ongoing teacher shortage will require increasing teacher recruitment and retention overall, especially for and among teachers in hard-to-staff areas like special education and STEM subjects. In Michigan, there is also emerging evidence of a more pronounced shortage of elementary certified teachers in certain, mostly rural, areas. Increasing teacher recruitment means encouraging more people, and more talented people, to choose education as a profession and encouraging them to take jobs where they are needed most. Several types of initiatives can support this goal. First, increasing teacher pay can encourage more people to become teachers. Second, given that teachers have a strong preference to work "close to home," districts in urban and rural areas may see success from developing "grow your own" programs that aim to attract people from the local community into teaching. Absent these kinds of initiatives to expand the pool of teachers, districts are likely to face increasing competition for teachers, which is likely to disadvantage districts and schools that teachers perceive as having more difficult working conditions.

The essence of increasing teacher retention is identifying ways to encourage teachers, particularly those who work in hard-to-staff schools, to remain in their school. Practitioners and policymakers could accomplish this through initiatives that increase compensation and improve working conditions. Targeted incentives can increase teacher retention, but they need to be both sufficiently large as well as sustained over time (Glazerman et al., 2013; Steele et al., 2010). While incentives and bonuses can be costly for districts, these costs need to be weighed against both the direct costs of teacher turnover along with the cost in terms of lower student achievement that results from turnover (Ronfeldt, Loeb, & Wyckoff 2013; Jackson & Bruegmann 2009; Kraft & Papay 2014; Sorensen & Ladd 2020). While compensation factors significantly in teachers' employment decisions, they value working conditions at least as much (Horng, 2009; Viano et al., 2021). This suggests that the teacher shortage can be alleviated by improving the climate and culture of schools, which may be accomplished through efforts to: promote collegiality among teachers within schools, improve student behavior and discipline, involve teachers in school-level decisions, and promote more positive relationships between schools and the communities they serve. School leaders also have a strong role in shaping teachers' working conditions and can make their school a place teachers want to work, as well as a place teachers want to leave (Berry et al., 2019; Boyd, Grossman et al., 2011; Burkhauser, 2017; Geiger

& Pivovarova, 2018; Harbatkin et al., 2023; Donaldson & Johnson, 2011; Johnson et al., 2012; Ladd, 2011; Petty et al., 2012). District leaders and policymakers would do well to recognize leaders as a powerful lever in teacher recruitment and retention efforts by working to develop leaders' skills in the areas that promote recruitment and retention and placing the strongest leaders in the most challenged schools.

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