

Team-Based Staffing, Teacher Authority, and Teacher Turnover¹

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Abstract

This study evaluates an innovative, team-based model of organizing teaching staff in elementary and secondary schools called the Next Education Workforce™ (NEW) initiative. The objective of the NEW initiative is to offer a viable and practical alternative to the long-criticized conventional classroom model of individual teachers each with their own classroom. In contrast to this traditional one-teacher, one-classroom approach, the NEW model integrates teams of teaching staff who share a roster of students, share multiple learning spaces, and collectively plan their teaching program with the aim of providing student-centered instruction. The model was designed at Arizona State University and first implemented in 2018 in partnership with two local school districts. The data for this study are from our statistical analyses of a survey of teachers in one of those districts, combined with district administrative records.

In this study we examine whether NEW Team members have implemented key elements and practices associated with the NEW model and to what extent this varies across different types of teachers and schools. In addition, we focus on a key component of the NEW model—that teams are provided with professional-like decision-making authority in regard to the design and implementation of the NEW model—and we investigate the level of authority NEW Team teachers hold. Finally, we assess whether NEW Team membership and teacher authority are related to teacher turnover—the departure of teachers from their schools or from teaching altogether.

Our analyses show that the overwhelming majority of teachers on NEW Teams, across different types of teachers and schools, reported that they and their Team have implemented key elements of the NEW model. The data also show that NEW teachers are more likely to report they have authority than non-NEW teachers. In addition, we found that, after controlling for other factors, NEW Team members are less likely to depart from their schools or districts. Similarly, teachers with more authority are less likely to depart than teachers with less authority. Finally, our analyses found a strong interaction and synergy between NEW Team membership and teacher authority. The relationship between turnover and NEW Team membership strengthens as the latter's level of authority increases.

Our findings, based on a limited, non-random sample of descriptive, non-causal data, suggest that the NEW model of team-based staffing is related to increased retention of teachers and that an essential component of the NEW model is the degree to which teachers are able to wield professional-like authority in regard to educational decisions.

Introduction

This study evaluates an innovative, team-based model of organizing teaching staff in elementary and secondary schools called the Next Education Workforce™ (NEW) initiative. The objective of the NEW initiative is to offer a viable and practical alternative to the often-criticized conventional classroom model of individual teachers each with their own classroom. The conventional classroom requires a teacher to achieve multiple goals with large numbers of young students, who come to school with diverse needs, and to do so alone and largely in isolation from colleagues. And, as we discuss in detail below, educational researchers and reformers have long held that this conventional model undermines quality instruction and makes it difficult for teachers to address their students' needs. In contrast to the one-teacher, one-classroom approach, the NEW model deploys integrated teams of teaching staff who share a roster of students, share multiple learning spaces, and collectively plan their teaching, with each Team member having different roles and responsibilities. The aim of the NEW staffing model is to enable teachers to provide personalized, student-centered instruction, tailored to the individual needs of students. To successfully address their students' needs, the model holds that teams must be provided with professional-like decision-making authority in regard to the design and implementation of the NEW model. The ultimate goal is to improve the performance, job satisfaction, and retention of teachers and in turn, student motivation and learning.

The NEW model was designed at Arizona State University and first implemented in 2018 in partnership with two surrounding school districts in Arizona. It has since spread to over 150 schools in a half dozen school districts in Arizona, California, and other states. Using survey and administrative data from Arizona's largest school district, the objective of our study is to evaluate the extent to which Team teachers enact the NEW model, to investigate the level of authority NEW Team teachers hold, and to assess whether NEW Team membership and teacher authority are related to teacher turnover—the departure of teachers from their schools or from teaching altogether.

Background and Context

Since the creation of the public school system, the manner in which elementary and secondary schools have been designed and organized has been subject to great controversy and reform. Continuous debate has surrounded a key question: What is the most effective and efficient design for organizing and managing students and teachers in classrooms and schools? Underlying this debate is the assumption that in addition to the quality of those who enter teaching, the design and organization of schools matter—in other words, that the characteristics of schools as workplaces make a difference to teachers' and students' performance.

One of the most contentious aspects of school organization has been the conventional classroom model—namely, individual teachers each with their own classroom. In his classic work on teachers, Dan Lortie (1975) described this as an “egg crate” model, in which large numbers of the once predominant one-room schoolhouses were consolidated under one roof. This consolidated school design followed a “cellular” pattern—schools as aggregates of multiple, identical, self-contained, independent cells of instruction. As historians such as Raymond Callahan (1962) and David Tyack (1974) have shown, this model was widely implemented over

a century ago with the creation of the taxpayer-funded public school system. The goal of the founders of the public education system was to deliver universal, uniform education services to a mass base of “customers” (i.e. students) at the lowest possible cost. To do that, such historians have documented, the newly created public educational system mirrored contemporary industrial production models, such as Henry Ford’s famous assembly line, by designing schools as rows of separate, identical classroom units through which students are conveyed in age-graded batches. At the time, proponents argued that the one-teacher, one-classroom model, with 25–35 students, was the most efficient and cost-effective method of undertaking such a large enterprise (Callahan, 1962). In short, a key motive for the implementation of the conventional classroom design was for economy and cost savings. This cellular classroom design has been the norm for the past century (e.g., Cuban, 2017; S. Johnson, 2019; Tyack & Tobin, 1994). But, despite its ubiquity, researchers have argued that the conventional classroom design is ill-fitted to the education of the young and ill-fitted to the work of teaching.

Going back to John Dewey (1902/1974), pedagogical theory holds that students’ learning is optimized when teachers are able to tailor their instruction to individual students’ needs—often called student-centered or personalized learning (e.g., Fullan & Langworthy, 2014). Such work, by definition, involves intensive interaction between teachers and their students. Imparting deeper engagement and learning to students has been akin to something of a “Holy Grail” in teacher education and preparation programs—a noble goal to which teachers are taught to aspire. However, this aspiration typically collides with reality. Teachers often find it very difficult to teach in this way in the conventional classroom setting.

Research on school organization and design has pointed out that the work of educating students in large school systems has a unique combination of characteristics that make the conventional classroom model an especially poor fit for teaching and learning (e.g., Bidwell, 1965; Lortie, 1975; Grant, 1983; Goodlad, 1984;Sizer, 1992; Ingersoll, 2003; S. Johnson, 2019; Labaree, 2021).

One characteristic is that teachers must simultaneously work with relatively large numbers of students. In many human-services and care-work occupations and professions, practitioners work with individual clients or small groups of clients at a time. In contrast, in the typical public school, teachers work with large numbers of student-clients—on average about 25 students per classroom.² For departmentalized secondary schools, in which teachers are assigned an average of 5 classes per day, teachers serve an average of 125 individual students per day. Moreover, students arrive at schools with diverse backgrounds, needs, and abilities. Yet, schools and teachers are tasked with educating all students, regardless of their level of preparation, motivation, or engagement. Indeed, unlike many other occupations and professions, teaching can entail working with student-clients who may not be voluntary participants.

² Through collective bargaining, in the 1970s and 1980s, teacher unions successfully negotiated reductions and limits on class sizes in most public schools (Kahlenberg, 2006). Our analyses of national data from the National Center for Education Statistics’ Schools and Staffing Survey/National Teacher Principal Survey indicate that, from 1988 until 2018, class sizes in regular courses in elementary and secondary public schools averaged about 25 students. (This excludes special education and ESL/bilingual education classes, which often require a smaller number of students.) Since the advent of the pandemic in 2020, public school enrollments have declined (2.5 percent by 2023), and as of 2021, regular class sizes in both elementary and secondary public schools averaged about 21 students.

Along with serving multiple and varied students, teaching requires educators to achieve multiple goals for these students. There has been little consensus and much disagreement across society regarding what the goals and end products of schooling ought to be (e.g., Bidwell, 1965, Tyack, 1974; Meyer and Rowan, 1978; Kirst, 1984; Chubb and Moe, 1990; Vollmer, 2010). While pluralism of mission is not the norm in many other types of organizations, this is inevitable in a decentralized school system, with significant local control and serving a diverse public. The public is not only legally entitled to a voice in local schooling, but also has widely varying, and sometimes competing, views of what their schools and teachers are expected to do with their children. Schools and teachers are tasked with an array of tasks, including both the academic instruction and socialization of the next generation. Typical lists of expectations for teachers are dauntingly long: building basic literacy skills (reading, math, writing, speaking); encouraging academic excellence; developing occupational or vocational skills; promoting good work habits and self-discipline; ensuring personal social-emotional growth; developing human relations skills; inculcating specific moral values; producing good citizens; enhancing social justice and multicultural awareness, and more.

Finally, research on school organization holds that there is another aspect of school design that makes the conventional classroom ill-fitted to teaching and learning—that unlike in many occupations and professions, the work of teachers is done largely in isolation from colleagues. In this perspective, the multiyear process of educating the young in school systems ought to involve inherently interdependent, collaborative, and collective work. However, as illuminated in Lortie’s (1975) analysis of the egg-crate model, schools are organized around teacher independence, rather than teacher interdependence. This undermines, rather than enhances, necessary collegiality, communication, and collaboration. Such isolation can be especially difficult for beginning teachers, who, upon accepting a position in a school, are frequently left to succeed or fail on their own within the confines of their classrooms—often likened to a “lost at sea” or “sink or swim” experience (e.g., Lortie, 1975; Smith & Ingersoll, 2004; S. Johnson, 1990; S. Johnson & Birkeland, 2003; Sizer, 1992).

As a result, from the perspective of research on school organization and design, the job of teaching in school systems presents a unique combination of characteristics and imperatives—to achieve multiple, and perhaps competing, goals with multiple, diverse, young student-clients, and to do so alone. Given the scale of the public educational system, from a financial perspective, the conventional one-teacher, one-classroom model, with 25 students per class, may make sense. But, from an organizational perspective, the conventional classroom model is not a suitable design to adequately address the needs of students and teachers. In short, in this view, the mismatch between the conventional classroom model and the needs of teachers and students undermines the performance, job satisfaction, and retention of teachers and, in turn, the motivation and learning of students (e.g., Bidwell, 1965; Lortie, 1975; Goodlad, 1984; Sizer, 1992; Grant, 1983; S. Johnson, 2019; Labaree, 2021).

Not surprisingly, the conventional classroom model of schooling has been the target of much reform. Widely varying initiatives—among them open-wall schools, collaborative team teaching, and professional learning communities—have all sought to alter the conventional classroom model in one way or another in order to improve a variety of teacher and student

outcomes and have been the subject of extensive reform and research (e.g., Rice et al., 2009; Hirsch et al., 2001; Cuban, 2017; Tyack & Cuban, 1995).

The NEW Model

The Next Education Workforce model is a recent alternative to the conventional classroom model. Rather than individual isolated teachers, each with a large number of students in their own classroom, the NEW model entails team-based staffing. Typically NEW Teams are comprised of on average 4–5 members, which may include a lead teacher, several certified teachers, and a preservice teaching candidate, who share responsibility for 100 or more students, depending on the grade levels. Extended teams, including reading and math specialists, special educators, and community members, provide additional support on an as-needed basis. The introduction of NEW Teams to schools is strictly voluntary, as is membership on teams. Schools and their teaching staff choose to partner with Arizona State University to set up the NEW model. The number of teams in a school varies. Often schools begin by setting up a small number of teams in selected grades and expand these over time. Some schools are entirely team based, with the whole school adopting the model, other schools entail a mix of conventional and NEW classrooms. Elementary schools may have teams at one grade level or multiple-grade teams. Secondary schools often have interdisciplinary teams that combine educators from different teaching fields.

The NEW model is comprised of eight key elements: providing each student with rigorous learning opportunities; having and using team planning time; sharing multiple learning spaces and moving across these spaces throughout the day; adjusting the schedule according to the needs of teachers and students; using data to tailor learning to each student; grouping and regrouping students based on student needs and interests; sharing a roster of students; and differentiating members' roles and responsibilities. The aim of the NEW model is to make deeper, personalized student-centered teaching and learning possible and sustainable. The ultimate goal is to improve the performance, job satisfaction, and retention of teachers and, in turn, student motivation and learning.

Many of the elements of the Next Education Workforce model are not new. Indeed, the model draws upon a number of well-known school design components: partnerships between higher-education and schools, team teaching, differentiated staffing, beginning teacher induction/support, faculty professional development, and enhanced teacher authority and input concerning educational decisions. The contribution of the NEW model is to bring these together in a unique, integrated package.

For example, through active partnerships with school districts, the NEW model seeks to bridge the gap between theory and the practical realities of the teaching job; NEW designers work with schools to design and adapt the model to actual classroom use and, ultimately, to foster its successful implementation.

Through team-based and differentiated staffing, this model seeks to pay explicit simultaneous attention to multiple student needs and outcomes, including students' academic

achievement and social-emotional learning. As mentioned above, the inability of single teachers to address multiple goals is one of the long-standing criticisms of the conventional classroom model.

By incorporating newly hired teachers and student teachers alike, this model also seeks to provide support, induction, and mentoring to help newcomers survive and succeed. Moreover, to address the needs of beginning and veteran teachers alike, the NEW model provides ongoing professional development and collaborative planning activities.

As mentioned, an important component of the NEW model is for teachers and their teams to be provided with substantial authority in regard to the design and implementation of the NEW model. We define teacher authority as the level of discretion and influence faculty hold in educational decision-making, both individually and collectively, within classrooms and schoolwide. In theory, the NEW model is not amenable to a top-down, one-size-fits-all approach. The NEW model holds that in order to successfully address their students' needs, NEW Teams will naturally take on more control over, and responsibility for, their programs. In short, the theory behind the NEW model suggests that there is a natural affinity and complementarity between teaming and teacher decision-making authority.

When the public educational system was created, a hierarchical decision-making model similar to that widely used in industry was adopted (e.g., Tyack, 1974; Bidwell, 1965; Lortie, 1975). At the school level, the norm over the past century has been that principals and administrators are, and should be, the main decision-makers in regard to school issues. And, decades of research has documented that most teachers have limited influence and input into educational decisions in most schools (for examples and reviews, see Goodlad, 1984; McNeil, 1988; S. Johnson, 1990; Conley, 1991; Sizer, 1992; Grant & Murray, 1999; Ingersoll, 2003; LeTendre & Akiba, 2018). But a long-standing aspiration of many school reformers has been to grant teachers an important role in school decision-making, both within and beyond the classroom. This genre of school reform has come and gone with different labels, including "school-based management," "teacher empowerment," "teacher professionalization," "teacher agency/voice," "site-based decision-making," "distributed leadership," and "teacher leadership." Regardless of the label, a common theme is to allow and enable teachers to wield enhanced decision-making authority in regard to their work and the school environment.

This aspiration is often tied to efforts to raise the professional stature of teaching. One of the hallmarks of the established professions, such as law, medicine, dentistry, academia, and engineering, is that practitioners hold substantial decision-making authority. The rationale behind this professional authority is to vest substantial levels of control in the hands of the experts—those who are closest to, and most knowledgeable of, the work (Freidson, 1986; Hodson & Sullivan, 2012). For example, professors often have equal or greater control than university administrators over the content of their teaching or research, the hiring of new colleagues, and, through the institution of peer review, the evaluation and promotion of members. As a result, academics are able to influence the ongoing content and character of their profession. Following this model, reformers seeking to enhance the professional standing and status of elementary and

secondary teaching often make increased teacher authority a key part of their initiatives (Ingersoll & Collins, 2019).

While, in theory, the success of the NEW model is tied to the enhancement of teacher authority in regard to classroom and school decision-making, it is unclear, in practice, how much authority NEW teachers actually hold, whether it differs from that of other teachers, and whether any differences in authority are tied to the performance of the NEW model. In prior research we documented that schools with higher levels of teacher authority, influence, and control have more positive student behavior, stronger teacher collegiality, higher teacher retention, and higher student achievement (e.g., Ingersoll 2003; Ingersoll et al., 2017; Ingersoll & Collins, 2019). An important part of our present study is to investigate the role of teacher authority in the NEW model.

Since the NEW model was originally implemented in 2018, there have been a number of commentaries and publications on its theory, rationale, components, and implementation (e.g., Audrain, 2023; Audrain & Basile, 2023; Audrain, et al., 2022; Maddin & Mahlerwein, 2022; Basile et al., 2023; Maddin et al., 2025). Additionally, several empirical studies have examined the characteristics, attitudes, efficacy, and effectiveness of NEW teachers (e.g., Johns Hopkins Institute for Education Policy, 2022, 2023a, 2023b; Chait & Diaz, 2024; Laski, 2024). Following up on these efforts, this current study is part of a larger series of projects examining the influence of the NEW model on various student and teacher outcomes. Our study here focuses on one of the goals of the NEW model—reduced teacher turnover.

While our study examines whether the model is associated with differences in teacher retention and turnover, it is not our objective to further examine the reasons for, or consequences of, any differences in turnover we discover, nor do we seek to speak to larger questions, and the literature, regarding the causes and costs/benefits of teacher turnover. However, it is important to note that behind the NEW model is the premise that teacher turnover—the departure of teachers from their schools or from teaching altogether—can be a problem for school systems and hence is an important teacher and school outcome and indicator. A growing body of empirical research covers many facets of teacher turnover, including its determinants, levels, variations, and consequences (for reviews, see S. Johnson et al., 2005; Guarino et al., 2006; Borman & Dowling, 2008; Carver-Thomas & Darling-Hammond, 2017, 2019; Nguyen et al., 2020). Turnover, of course, can be beneficial for students in cases where the departing teachers are ineffective or low-performing and the entrance of “new blood” into faculties enhances innovation and student learning (e.g., Ingersoll & May, 2012; Grissom & Bartanen, 2019). On the other hand, a number of studies have shown that turnover in teaching can incur substantial financial costs (e.g., Texas Center for Educational Research, 2000; Villar & Strong, 2007; Alliance for Excellent Education, 2005; Barnes et al., 2007; Milanowski & Odden, 2007; Watlington et al., 2010; Synar & Maiden, 2012). Moreover, a growing number of studies have documented that turnover can have a negative impact on faculty quality, student achievement, and school performance (e.g., Levy et al., 2010; Keesler, 2010; Henry & Redding, 2018; Merrill, 2014; Smylie & Wenzel, 2003, Clotfelter et al., 2006; Krieg, 2004; Sorensen & Ladd, 2020). In our own research we have documented that teacher turnover is a leading factor behind teacher shortages, including for math/science teachers and teachers of color (e.g., Ingersoll, 2001; Ingersoll & Perda, 2010; Ingersoll & May, 2012; Ingersoll et al., 2019; and Sutcher, Darling-Hammond & Carver-

Thomas, 2016). In turn, in the realm of educational policy and reform, there has been a growing recognition of the need to address high levels of teacher turnover (National Commission on Teaching and America's Future, 2003; Alliance for Excellent Education, 2005; Aragon, 2016; Garcia & Weiss, 2019; American Federation of Teachers, 2022).

The Study

The objective of this study is to investigate the NEW model and its relationship with teacher authority and, in turn, teacher turnover. An important factor in evaluating whether any particular educational reform initiative is successful is to first establish the extent to which it is actually enacted. The history of educational reform is littered with well-intentioned reforms that were never fully implemented (see Cuban, 2017; Kirst, 1984; Vollmer, 2010). We begin by examining the eight key elements and practices, mentioned above, that are associated with the NEW model and investigating variation in their implementation by teachers on NEW Teams. We then focus on the degree to which teachers report that they have authority in regard to key educational decisions in their classrooms and schoolwide—and we investigate the role of teacher authority in the NEW model. Finally we assess whether NEW Team membership, along with teacher authority, are associated with the likelihood of staying with, or departing from, one's school.

We focus on three research questions:

1. The Practices of Teachers on NEW Teams

Do teachers on NEW Teams implement and practice the eight key elements of the NEW model, and does this vary across different types of teachers and schools?

2. Teacher Authority

How much authority in regard to educational decision-making, both within classrooms and schoolwide, do teachers have, and does this differ between NEW teachers and others?

3. NEW Team Membership, Teacher Authority, and Teacher Turnover

Are NEW Team members more or less likely to depart their school, and is this related to their degree of authority?

Data and Methods

The main source of data for this study is the Mesa Teacher Survey conducted in the spring 2023 semester by the Institute for Education Policy at Johns Hopkins University for the Mesa Public Schools (MPS) and the Mary Lou Fulton Teachers College at Arizona State University. With over 50,000 students across 82 school sites, Mesa is the largest school district in Arizona. In the spring semester of the 2022–23 school year, all teaching staff (3,602) employed in MPS, including 342 teachers on NEW Teams, were sent the Mesa Teacher Survey; 2,153 teachers responded—a response rate of 60 percent. NEW and non-NEW teachers had a similar response rate. The survey asked teachers a series of questions about their teaching practices, job conditions, relations with students, perceived efficacy, job satisfaction, and career commitment.

To the Mesa Teacher Survey data, we added administrative data from MPS to provide information on the demographic characteristics of teachers and their schools in the 2022–23 school year, on teachers’ performance evaluation scores from the prior two years (2020–21 and 2021–22), and on teacher departures from their school or the district between the end of the spring semester 2023 and early in the fall semester 2023. From the original survey sample we culled a small number of teachers on temporary contracts for whom MPS data was not available—bringing our final analytic sample to 1,935, including 142 teachers on NEW Teams in 24 different schools. Note, our data are not longitudinal and do not follow a cohort of teachers in and out of teams and schools. Our data is cross-sectional, representing a snapshot of a sample of teachers in spring semester 2023 and then whether those teachers had departed their school by fall 2023. The NEW teachers in the sample vary in how long they have been on teams and when their teams were originally created.

Several limitations of our teacher survey data warrant mention. First, our study is a small-scale examination of teachers involved in one reform model in one school district. While this may provide valuable information for that particular setting—MPS—it is important to recognize the limits to generalizing from our findings to NEW Teams in other school districts, or to other types of team-teaching models, or to reform initiatives similarly concerned with addressing teacher turnover in general.

Second, given the significant portion of MPS teachers who did not respond to the survey (40 percent), we cannot assume that our teacher sample is representative of teachers in our district. To explore how our teacher analytic sample may differ from the total population of MPS teachers, we conducted background sensitivity analyses comparing the demographic characteristics of our teacher survey sample with those of the entire population of teachers in the district. These comparisons included between teachers’ individual characteristics, such as race-ethnicity, experience, and gender, and the characteristics of their schools, such as size, level, and students’ poverty level. We found our survey sample of teachers closely resembles the overall MPS teacher population, and the survey sample of NEW teachers resembles the total MPS NEW teacher population, giving us some confidence in the representativeness of our sample.³

Third, not only is the survey sample not random, but Team membership is not random. Membership is a matter of self-selection—those who set up, or join, NEW Teams volunteer for that role. It could be the case that those who are more likely to volunteer for a NEW Team and desire to be part of this new reform initiative may be different from non-NEW teachers in other important and consequential ways. As a result, any relationships found between turnover and our variables of interest could, of course, be the result of such factors. For instance, those who hold favorable attitudes toward the teaching job and career may also be more likely to volunteer for a NEW Team, may be more interested in school decision-making, and may be more likely to stay in teaching, regardless of being on a Team. Short of conducting a randomized control trial, it is not possible for us to untangle or control for such factors. In our analyses we further explore some potential sources of bias, by controlling for measures of teachers’ attitudes toward teaching, such as their degree of career commitment and whether they would recommend

³ Notably, none of the differences between the NEW teacher population in MPS and the NEW teacher sample in the survey were statistically significant.

teaching to others. These measures captured teachers' attitudes when the survey was conducted during the 2023 school year and it should be noted that we do not know if these attitudes were pre-existing before teachers entered teaching, or prior to joining teams, or whether they formed afterward. It, of course, could be the case that NEW Team membership itself changes one's attitudes toward teaching.

Fourth, it is important to recognize that the teacher survey data represents individual teachers' reports of their practices and conditions in their classrooms and schools. By definition, these are subjective perceptions, subject to bias. As described below, to explore differences in these perceptions we examined the extent to which teachers' reports on their NEW practices or their levels of authority varied across types of teachers and types of schools.

Fifth, the data do not include identifying information for teams—team-level IDs. Hence, we cannot aggregate the individual-level responses to the Team level. As a result, while we have information on who is on teams, we do not have information on the characteristics of their teams—their number, size, duration, demographics, response rates to the survey, when introduced into schools, etc. Hence, our analysis cannot examine whether teams and their characteristics, themselves, have an independent relationship with turnover.

Given the data limitations discussed above, our findings must be interpreted with caution. Moreover, it is important to recognize that our estimates represent descriptive patterns, and that any relationships between our variables represent associations and do not imply the direction of the relationship, nor causality.

Our analyses of the combined teacher survey/administrative data are divided into two stages. In the first stage, we generate and examine descriptive statistics to address our first two research questions. In the second stage, we follow up with a multiple logistic regression analysis of the predictors of teacher turnover to address our third research question. Below, we describe these stages of our analysis. Table 1 and Table 2 provide definitions and basic statistics for the variables utilized in our analyses.

Table 1: Definitions of Variables Utilized in the Analysis

NEW Team Member: a dichotomous variable where 1 = teacher is a member of a NEW Team and 0 = non-Team teachers.

Teamness: for Team members, a continuous variable, on a scale of 0 to 8, that is the sum of the eight elements of the NEW model that Team members reported they and their team practiced: provide each student with rigorous learning opportunities; have and use team planning time; share multiple learning spaces and move across these spaces throughout the day; adjust our schedule according to our needs and the needs of our students; use data to tailor learning to each student; group and regroup students based on student needs and interests; share a roster of students; each have different roles and responsibilities.

Teacher Turnover: a dichotomous variable where 1 = not teaching in same school or not teaching in Mesa district and 0 = stayer/currently teaching in same school.

Teacher Characteristics

- **Beginner:** a dichotomous variable where 1 = teacher with less than or equal to 5 years of experience and 0 = other teachers.
- **Veteran:** a dichotomous variable where 1 = teacher with more than 20 years of experience and 0 = other teachers.
- **Female:** a dichotomous variable where 1 = female teacher and 0 = male teacher.
- **White, non-Hispanic:** a dichotomous variable where 1 = White, non-Hispanic teacher and 0 = other teachers.
- **MS Degree:** a dichotomous variable where 1 = teacher has a master's degree or more and 0 = no master's degree.
- **Performance Evaluation:** administrators' ratings of teachers' classroom performance on a scale of 1 = Ineffective, 2 = Developing, 3 = Effective, 4 = Highly Effective.

School Characteristics

- **School Size:** student enrollment in the school.
- **Poverty Enrollment:** percentage of students eligible for the federal free or reduced-price lunch program for students from families below the poverty level.
- **Elementary School:** a dichotomous variable where 1 = elementary school and 0 = junior high school, high school, or combined (k-12) school.
- **Junior High School:** a dichotomous variable where 1 = junior high school and 0 = elementary school, high school, or combined (k-12) school.
- **High School:** a dichotomous variable where 1 = senior high school and 0 = elementary school, junior high schools, or combined (k-12) school.

Teacher Authority: on a scale of 1 = "Strongly Disagree" to 6 = "Strongly Agree," the mean of teacher's level of agreement with five statements: I am trusted to make instructional decisions; I control how I use scheduled class time; I set grading and student assessment practices; I am free to be creative in my teaching approach; and I contribute to decisions about educational issues at my school.

Attitudes Toward Teaching Job

- **Commitment to Teaching:** teachers reporting "Teaching" when asked "What do you expect to be doing in your career five years from now." Answer options were: "Teaching; "Something else in education"; "Working in a different field"; "Retired"; "Not working."
- **Recommend Teaching:** teachers reporting ge 5 "on a scale of 0 = (Not at All Likely) to 10 = (Extremely Likely), how likely are you to recommend teaching to a friend, family member, or acquaintance."

Working Conditions

- **Teaching/Planning Time:** on a scale of 1 = "Strongly Disagree" to 6 = "Strongly Agree," teachers' agreement with two statements: "My scheduled workday includes sufficient planning time" and "My scheduled workday includes sufficient instructional time to meet the needs of my students."
- **Professional Learning:** on a scale of 1 = "Strongly Disagree" to 6 = "Strongly Agree," the mean of teachers' level of agreement with six statements: "I have sufficient resources for my professional learning"; "The professional learning I receive meets my needs"; "Professional learning provides ongoing opportunities for me to work with colleagues to refine my practice"; "I receive follow-up after professional learning activities to give me additional support"; "Professional learning opportunities enhance my ability to meet student needs"; "My professional learning opportunities this year made me a more effective educator."

Table 2: Descriptive Statistics for Variables Utilized in Analysis

Variables	Means or Percentages (standard errors in parentheses)		
	All Teachers	NEW Teachers	Non-NEW Teachers
<u>Sample Size</u>	1935	142	1793
<u>Teamness (0-8)</u>	-	7.06 (.125)	-
<u>Teacher Turnover</u>	22.3 (.946)	18.3 (3.26)	22.6 (.988)
<u>Teacher Characteristics</u>			
Beginner	25.3 (.989)	39.4 (4.12)	24.2 (1.01)
Veteran	15.7 (.827)	11.3 (2.66)	16.1 (.867)
Female	80.5 (.902)	85.2 (2.99)	80.1 (.943)
White, non-Hispanic	78.9 (.928)	71.8 (3.79)	79.4 (.955)
MS Degree	49.3 (1.14)	40.9 (4.14)	50 (1.18)
Performance Evaluation (1-4)	3.6 (.013)	3.54 (.048)	3.6 (.013)
<u>School Characteristics</u>			
School Size	1379 (27.9)	1209 (100)	1393 (29.1)
Poverty Enrollment	57.1 (.467)	66.4 (1.58)	56.4 (.473)
Elementary School	55.9 (1.13)	57.8 (4.16)	55.8 (1.17)
Junior High School	14.3 (.798)	18.3 (3.26)	14.1 (.821)
High School	22.5 (.949)	18.3 (3.26)	22.8 (.991)
<u>Teacher Authority (1-6)</u>	4.40 (.027)	4.75 (.091)	4.37 (.029)
<u>Attitudes Toward Teaching Job</u>			
Commitment to Teaching	51.8 (1.2)	63.4 (4.1)	50.9 (1.2)
Recommend Teaching	45.1 (1.2)	55.9 (4.3)	44.1 (1.2)
<u>Working Conditions</u>			
Teaching/Planning Time (1-6)	3.41 (.033)	3.78 (.119)	3.37 (.035)
Professional Learning (1-6)	3.84 (.03)	4.21 (.099)	3.8 (.031)

Note: School means or percentages are at the teacher level and associated with teachers in the sample.

In the first stage, we undertake descriptive analyses of data from the combined data file to assess the extent to which NEW teachers' practices are aligned with the NEW model. We utilized a set of yes/no dichotomous measures in the teacher survey that asked whether they and their teams practiced eight key elements of the NEW model: "provide each student with rigorous learning opportunities"; "have and use team planning time"; "share multiple learning spaces and move across these spaces throughout the day"; "adjust our schedule according to our needs and the needs of our students"; "use data to tailor learning to each student"; "group and regroup students based on student needs and interests"; "share a roster of students"; "each have different roles and responsibilities."

This battery of questions on implementing the NEW model was intended to be answered only by teachers on NEW Teams, preventing full comparisons to the practices of non-NEW teachers. However, along with NEW teachers, a similar number (130) of non-NEW teachers inadvertently answered the battery on whether they practiced those eight elements. We compare the responses of these non-NEW teachers with those of NEW teachers to discern if there are differences in their reported instructional practices, especially of practices concerned with student-centered teaching. Given the small size of the non-NEW subset, this is strictly a background exploration.

We also create a continuous measure of the overall degree of "Teamness" reported by each NEW teacher for themselves and their Team—by indicating the total number of the eight elements Team members reported they practiced. We examine the extent to which Teamness varies across different types of teachers and schools.

We then turn to our second research question and examine data from the teacher survey on teachers' authority and the extent to which this varies across different types of teachers and schools. To do this we used a battery of five items in the teacher survey that asked teachers to what extent they agreed that: "I am trusted to make sound professional decisions about instruction"; "I control how I use my scheduled class time"; "I set grading and student assessment practices in my classroom"; "I am free to be creative in my teaching approach"; and "I contribute to decisions about educational decisions at my school." Answers to these items were made on a six-point scale, from "Strongly Disagree" to "Strongly Agree." We also create an overall measure of teacher authority by calculating the mean of these five survey items.

The second stage of the analysis addresses our third research question by using logistic regression methods to examine whether the likelihood of individual teachers departing their teaching jobs following the school year is related to NEW Team membership and to teachers' level of authority during the school year, after controlling for a number of teacher and school characteristics.

In the logistic regression models, the dependent variable—teacher turnover—is based on a dichotomous measure in the MPS administrative data file of those teachers who departed from their school between the end of the spring semester 2023 and early fall semester 2023. Our measure of turnover is similar to the measure of total teacher turnover used in national data from the National Center for Education Statistics of the U.S. Department of Education (see, for e.g.,

Ingersoll et al., 2019; Taie & Lewis, 2023), thus allowing us to benchmark MPS against the nation.

Our measure of turnover is comprehensive—it includes both migration and attrition and includes all departures, regardless of reason. Migration includes teachers who moved to another school, whether in MPS, in another district, in another state, or to a private school. Attrition includes those who left teaching altogether, for any reason, such as termination, retirement, health, and career changes. For instance, classroom teachers who moved from one school in the district to another in the district, or teachers who became school administrators, even if within the same school, are counted as turnover. Our data preclude us from separately examining migration and attrition. Many assume that migration is a less consequential type of turnover because it does not decrease the overall supply of teachers and does not contribute to overall systemic shortages. However, at the organizational level, migration is as important as attrition. From this perspective, whether those departing are moving to a similar job or leaving the occupation altogether, their departures similarly impact the organization. Moreover, using national data, we have documented large school-to-school differences in levels of migration and in the destinations of movers. The net result is a large annual asymmetric reshuffling of teachers within the school system, with a net loss on the part of high-poverty and relatively disadvantaged schools and a net gain on the part of low-poverty and more advantaged schools. For instance, nationally, the flow of teachers from high-poverty schools to low-poverty schools is several times the reverse, underscoring the importance of migration (see Ingersoll, 2001; Ingersoll & May, 2012; Ingersoll & Tran, 2023). Like most analyses of employee turnover in other types of organizations and occupations, we combine both types of flows here.

Following previous research on teacher turnover, in the logistic regression models we include control variables for several key individual teacher demographic characteristics: race/ethnicity, gender, and years of teaching experience. Because of teaching experience's U-shaped relationship to turnover, we transform it into a three-category set of dummy variables—beginner (less than or equal to 5 years), middle (6–19 years), and veteran (greater than or equal to 20 years). In addition, we included a control measure for teachers' education and preparation: having a master's degree or more. Finally, we also included as a control a proxy measure of teacher quality—each teacher's performance evaluation scores from the prior two school years on a four-point scale: ineffective, developing, effective, highly effective.⁴

Our dataset does not include information on Team members' years of experience on their Team, hence we cannot control for whether Team members are Team newcomers or veterans. However, because the NEW model, first implemented in MPS in 2018, had spread rapidly by the survey year (2022–23), most Team members were likely relatively new to working on teams. In addition, unlike most analyses of the relationships between teachers' working conditions and teacher turnover (e.g., S. Johnson et al., 2005; Guarino et al., 2006; Borman & Dowling, 2008, Nguyen et al., 2020), we did not control for the effects of differences in teachers' pay. Teachers' earnings data were not available from the district. But this factor is less important to us than if

⁴ The teacher performance evaluation scores are skewed upward on the effectiveness scale. There were virtually no teachers scored as ineffective, and only a few scored as developing. There was, however, variation in teachers' performance evaluations. Similar to a kind of grade inflation, the scale was foreshortened—teachers were divided evenly between the top two categories—effective and highly effective (see Table 2).

we were comparing teachers across districts and states because we are comparing teachers within one district, whose pay is set by a standard single salary schedule based on teaching experience and graduate degrees completed. And, as mentioned, we do control for both teaching experience and graduate-degree attainment.

Moreover, following previous research, our regression models include, as independent variables, school characteristics typically found to be important in the school effects literature: school level, school size, and the proportion of the student population in poverty (i.e., eligible for the federal free or reduced-price lunch program).⁵

Our first set of regression models examines whether teacher turnover is related to NEW Team membership and to teachers' level of authority, after controlling for the above characteristics of teachers and their schools. In a second set of models we further explore, and try to mitigate, potential teacher bias, as mentioned above. We estimate our same models with added controls for two survey questionnaire measures of teachers' attitudes toward the teaching job. Our first measure focuses on those who reported "Teaching" when asked: "Given what you know now, what do you expect to be doing in your career 5 years from now?" Answer options were: "Teaching"; "Something else in education"; "Working in a different field"; "Retired"; "Not working." Our second measure uses teachers' responses to a second teacher survey question: "On a scale from 0 to 10, how likely are you to recommend teaching to a friend, family member or acquaintance?" Answer options ranged from "not at all likely" to "extremely likely."

In a third set of models we try to assess whether teacher authority is an important component of the NEW model and an important organizational and working condition in schools. There are, of course, other important design components of the NEW model and other important working conditions in schools. In this additional analysis, we examine two other key components of the NEW model and school working conditions: whether teachers are provided with adequate professional learning opportunities and whether they are provided with sufficient planning and teaching time to meet their students' needs. Along with teacher authority, both are, in theory, important to the success of the NEW model, and are assessed in the Mesa Teacher Survey. We create models with these two other measures of teachers' working conditions in schools and compare their estimates to those of teacher authority. The objective of this supplement is to empirically investigate whether our singular focus on teacher authority was warranted.

Finally, in a background exploratory check, we re-estimate our first set of models using school-fixed effects methods. The latter would normally be useful in our analysis because fixed effects methods effectively control for the influence of school-to-school differences and allow estimation of the differences between NEW and non-NEW teachers within schools. However, our dataset prevented us from adequately employing fixed-effect models because a significant portion of schools and teachers in the sample were excluded from the analysis. These were

⁵ The proportion of a school's enrollment that is students of color, that is from historically underrepresented racial-ethnic groups, is also related to teacher turnover. However, students of color enrollment is highly intercorrelated and confounded with poverty enrollment and, since the latter had a stronger relationship to turnover, we did not include the former in our final regression analyses. For an analysis of teacher turnover that differentiates these effects, see Ingersoll & May, 2012.

primarily small schools in which there was no variation in turnover because either all or none of the teachers in the sample departed. Hence, we treat our fixed-effect models simply as an exploratory background check of the robustness of the findings in our earlier models.

Results

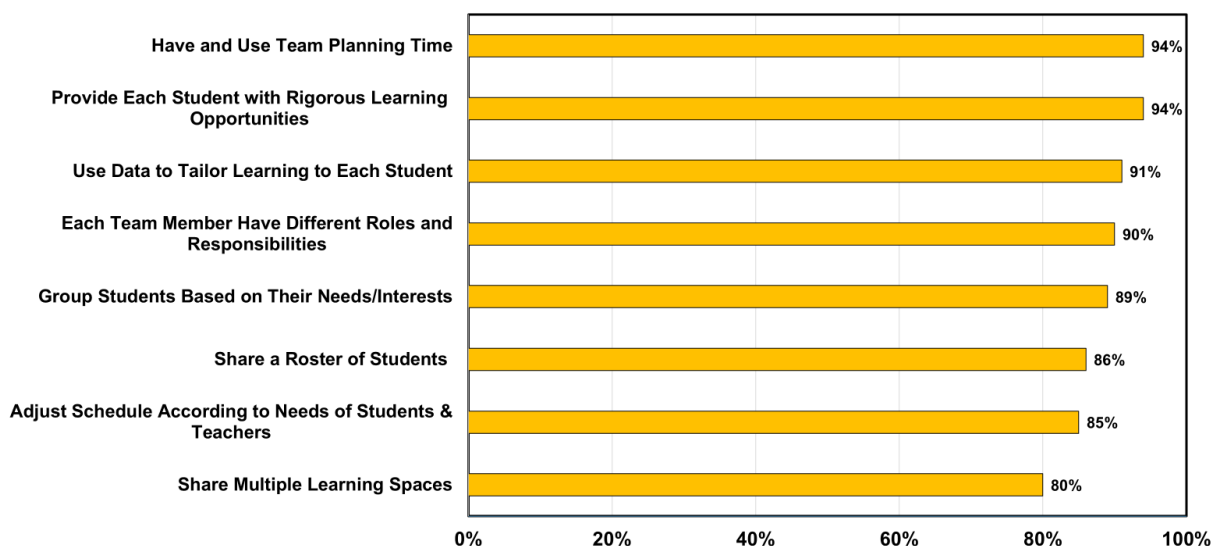
1. The Practices of Teachers on NEW Teams

When evaluating any educational reform initiative, it is critical to first establish the extent to which it has actually been implemented. Hence, a key question for our study was whether teachers on NEW Teams have actually undertaken what the NEW model proposes. To attempt to answer this question, we examined the battery of questions in the teacher survey that asked Team teachers whether they, and their Team's members, practice the eight key elements of the NEW model of teaching.

As shown in Figure 1, the overwhelming majority of teachers on NEW Teams reported that they and their team do practice all eight key elements of the NEW model, reflecting team teaching and personalized and student-centered educational practices. But it is also worth noting that about a fifth of the Team teachers indicated they do *not* practice two of the elements—they do adjust their schedules according to their needs and the students' needs or share multiple spaces with Team members and move across these spaces during the day. It is unclear from the survey data why these elements are less practiced, though it could be the case that, even with implementation of the NEW model, schedules and space remain controlled and determined by school leaders and not teachers themselves.

While these data suggest that NEW Teams are in practice mostly adhering to the model, it is important to recognize two limitations of such data, mentioned earlier. First, the battery of questions on practicing NEW model elements was intended to be answered only by teachers on NEW Teams, preventing comparison with others. However, an equivalent number of non-NEW teachers inadvertently answered those items, and while representing a limited number of non-NEW teachers, these data allow us to compare the two groups' reported practices. Interestingly, for each of the eight elements, the majority of non-NEW teachers reported that they also practice the element in their classrooms. But, for all eight elements, NEW teachers were more likely than non-NEW teachers to report that they adhere to the practice, and in most cases the differences were strongly statistically significant. For instance, while 85 percent of NEW teachers reported that they adjust their schedule according to the needs of their students, 69 percent of non-NEW teachers said they do so. Thus, most teachers reported that they undertake key practices, but this is at a higher rate among NEW teachers.

Figure 1: Percent Teachers on NEW Teams Reporting That They and Their Team Practice 8 Key Elements of the NEW Model



Second, the questions on practicing NEW elements do not tell us if teachers on NEW Teams do, in fact, implement the model; the data tells us what they believe to be the case. As mentioned earlier, by definition, these reports are subjective perceptions and, of course, reflect Team members' personal experiences and attitudes.

To explore differences in Team members' perceptions, we turn to an examination of variation across types of teachers and schools in the degree to which Team members reported that they and their Team practice the key elements of the NEW model. We created a continuous measure of the overall degree of "Teamness" reported by each NEW teacher for their team—by summing the total number of elements that Team members reported practicing. Displayed in column I of Table 3 are the percent of Team members who reported practicing seven or more of the eight key elements. We disaggregated these Teamness scores across different types of NEW teachers and across different types of schools.⁶

Consistent with Figure 1, three-quarters of all NEW teachers report a high degree of Teamness for their NEW Teams. There also appear to be some differences in Teamness by teachers' race and experience. Teachers of color appear to be more likely to have reported a high degree of Teamness than were white, non-Hispanic teachers. Veteran teachers appear to be less likely than beginning teachers to have reported a high degree of Teamness. However, these comparisons are at a low level of statistical significance, which is not surprising given the small sample sizes of these subsets of NEW teachers. Moreover, there was little difference in the reported degree of Teamness across different types of schools, by school poverty level, or school

⁶ School poverty is based on the percentages of students who qualified for the federal reduced and free lunch program for children from low-income families. The subsets, small and large school size, and low and high school poverty, represent the lowest and highest quartiles of the sample distribution.

size and school level. For instance, teachers in high-poverty schools were neither more nor less likely to report a high degree of Teamness than those in low-poverty schools.

While, as noted earlier, these measures of the degree to which teams implement the NEW model represent teachers' subjective perceptions, it is striking that there appear to be few significant differences in these perceptions across these types of teachers and schools, lending us some confidence in our measures of team practices.

Table 3: Teamness and Teacher Authority, by Teacher and School Characteristics

Teacher and School Types	<u>I. Teamness</u> Percent of Teachers on NEW Teams Reporting Their Team Practices 7 or More of 8 Elements of the NEW Model	<u>II. Teacher Authority</u> Mean Percent of Teachers Who Agree or Strongly Agree with 5 Statements about Teacher Authority	
		NEW Teachers	Non-NEW Teachers
All	75 (3.7)	72 (2.7)	59 (.88)
Beginner (<5 yrs)	77 (5.7)	63 (4.9)	61 (1.8)
Veteran (> 20 yrs)	63 (12.5)	75 (5.9)	59 (2.2)
White, non-Hispanic	72 (4.5)	71 (3.1)	58 (.98)
Teacher of Color	83 (6.1)	72 (5.4)	61 (1.9)
Female	74 (4.0)	72 (2.9)	58 (.97)
Male	76 (9.5)	71 (7.1)	62 (2.1)
Performance Evaluation – Developing	NA	NA	55 (6.9)
Performance Evaluation – Highly Effective	80 (5.4)	79 (3.7)	60 (1.3)
Large School (>2440 students)	69 (9.2)	75 (4.2)	61 (1.6)
Small School (<540 students)	79 (7.2)	63 (3.4)	54 (1.3)
High-Poverty School (>74%)	76 (5.2)	69 (4.0)	56 (1.9)
Low-Poverty School (<43%)	74 (10.4)	80 (5.1)	61 (1.8)
Elementary School	76 (4.8)	66 (4.0)	53 (1.2)
Junior High School	73 (8.9)	81 (5.0)	73 (1.9)
High School	69 (9.2)	75 (4.2)	61 (1.8)

Notes:

-Standard errors in parentheses

-NA: not available due to small sample size

-School poverty is based on the percentages of students who qualified for the federal free and reduced-price lunch program for children from low-income families. The subsets, small and large school size, and low and high school poverty, represent the lowest and highest quartiles of the sample distribution.

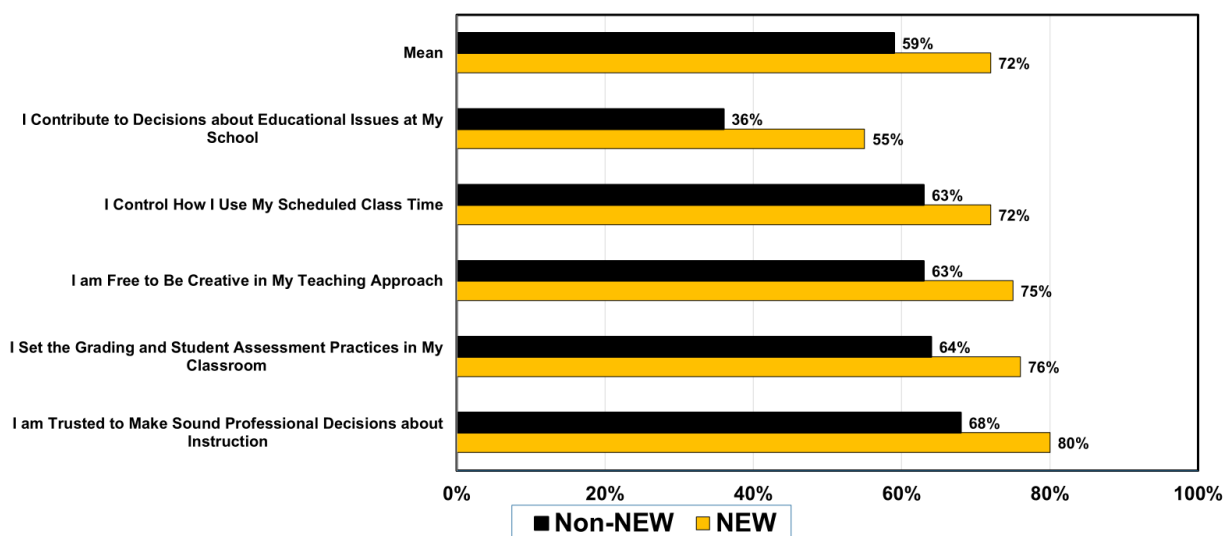
2. Teacher Authority

One of the assumptions underlying the NEW model is that teams' success requires having a certain degree of teacher authority in regard to classroom and schoolwide decisions. To examine the level of the authority of NEW teachers and how it compares to non-NEW teachers, we examined a battery of five items in the teacher survey on teachers' control and input into key educational decisions. Figure 2 displays the percentages of Team members and non-Team members who responded with "Agree" or "Strongly Agree" to each item (i.e. 5 or 6 on the 1-6 scale). Note that, as shown in Table 2, the teacher authority measure is skewed upward. Less than a quarter of teachers scored below 4 for most of the five issues and over three quarters scored 4 or higher.

Notably, NEW teachers were more likely to report having authority than non-NEW teachers, for all five issues, and at statistically significant levels. Moreover, our further analyses indicate that among NEW teachers, those who report higher levels of Teamness were also more likely to report having authority than those with lower levels of Teamness. Hence, the data indicate there is a strong affinity between the NEW model and enhanced teacher authority.

The data in Figure 2 appear to show that most NEW teachers have very high levels of authority. However, if we solely focus on those who scored 6 ("strongly agree"), the percentages change dramatically, suggesting more moderate overall levels of teacher authority. NEW teachers again are more likely to report that they have authority than non-NEW teachers on each of the five issues, but far fewer—usually about a quarter—*strongly agree* that they do so.

Figure 2: Percent Teachers on NEW Teams and not on New Teams Who "Agree" or "Strongly Agree" with Statements about Teacher Authority



It is also important to recognize the differences in teacher authority across different issues. Consistent with other studies we have done (e.g., Ingersoll & Collins, 2019), teachers' levels of within-classroom authority are higher than their authority over schoolwide issues. For instance, while 80 percent of NEW teachers agree "I am trusted to make sound professional decisions about instruction," and 76 percent agree "I set the grading and student assessment practices in my classroom," only 55 percent agree that "I contribute to decisions about educational issues at my school." And this gap between within-classroom and schoolwide decision-making is even greater for non-NEW teachers.

Finally, as shown in column II of Table 3, there are also differences in overall levels of teacher authority across different types of teachers and schools, especially in the case of NEW teachers. For NEW teachers, veterans were more likely to report having authority than beginners. This was not true for non-NEW teachers. Similarly, among NEW teachers, those in larger schools and in low-poverty schools were more likely to agree they have authority, at statistically significant levels. Our analyses did not investigate the sources of these school-to-school differences in authority; however, in other analyses we have found similar differences in teacher authority, especially between high- and low-poverty schools (e.g., Ingersoll, Sirinides and Dougherty, 2017).

3. New Team Membership, Teacher Authority and Teacher Turnover

The above findings indicate that Team members report that they do practice the key elements of the NEW model and do have more authority than non-Team members. The next question involves the relative turnover of Team and non-Team members. Are NEW Team members more or less likely than other teachers to depart from their school or to leave the school district entirely, whether they are moving to another school or leaving teaching altogether? Moreover, is any relationship between Team membership and likelihood of turnover related to the degree of authority held by Team members?

As previously shown in the descriptive data in Table 2, the turnover rate for NEW teachers was 18.3 percent and for non-NEW teachers was 22.6 percent (this was only borderline statistically significant). However, as also shown in Table 2, NEW teachers also differed from others in their demographic characteristics and in the types of schools in which they are employed. For example, Team members were more likely to be beginners, and they were less likely to hold master's degrees or higher and to be white, non-Hispanic than non-Team teachers. Team members were also more likely to teach in elementary schools, smaller schools, and schools with more students from poverty-level families. Moreover, our background analyses show that many of these factors are individually related to turnover. Beginning teachers, female teachers, teachers with master's degrees, and teachers with higher performance evaluations were all more likely to depart than were other teachers, at a statistically significant level. Some of the school characteristics were also individually related to turnover. Teachers in higher-poverty schools and in smaller schools had statistically significantly higher rates of turnover than others. Hence, to understand the relationship between NEW Team membership and turnover, it is necessary to control for these other factors.

We used logistic regression to estimate a series of models to examine whether being on a NEW Team is associated with a teacher's likelihood of departing, after controlling for teacher

and school characteristics. The predictor variables and their associated odds ratios are shown in Tables 4a and 4b.

As shown in model 1 of Table 4a, and parallel to Table 2, Team membership alone appears associated with reduced turnover, but this was not at a statistically significant level. However, after controlling for the other factors, NEW Team membership became strongly associated with lower turnover and at a statistically significant level (model 2). The odds of NEW Team members departing were 50 percent less than other teachers (odds ratio = .499). In other words, after controlling for teacher and school characteristics, teachers in NEW Teams were half as likely to leave their schools as their non-Team peers. The control predictors whose introduction into the model resulted in change to the Team membership odds ratio were school size and teachers' performance evaluations. However, neither also had a significant interaction with Team membership.

Models 3 and 4 include teacher authority as an independent variable, excluding Team membership, and with and without controls. In each case, authority is strongly associated with lower turnover and at a statistically significant level. (To aid in the interpretation of the coefficients, we centered our authority measure around a mean of 0.)

In model 5, we include both Team membership and authority, along with controls. The results show that both NEW Team members and those with more authority were less likely to depart. The odds of NEW Team members departing were 41 percent less than other teachers (odds ratio = .59). For every 1-unit increase in a teacher's authority, the odds of departing were 27 percent less (odds ratio = .73) than for other teachers. That is, teachers who report they had more authority were significantly less likely to leave their schools. Interestingly the results also show that with the addition of the authority variable to the model, the odds of departing for NEW Team members decreased slightly, from 50 percent in model 2 to 41 percent in model 5. This latter finding suggests that having higher authority accounts for part of the lower turnover of NEW teachers.

In model 6 we added an interaction term for Team membership and teacher authority to assess whether the relationship between Team membership and turnover is related to teachers' level of authority. The odds ratio (= .62) for the main effect of Team membership represents its relationship with turnover when authority is set at 0. The results suggest that Team members with average authority remained less likely to depart than non-Team members, but this no longer remained statistically significant. The main effect of teacher authority (odds ratio = .76) remained highly statistically significant. This indicates that, even among non-Team members (when Team membership is set at 0) the relationship between having authority and turnover is strong. In other words, regardless of Team membership, teachers with more authority were still less likely to depart from their positions.

Table 4a: Odds Ratios from Logistic Regression Analysis of the Likelihood of Teacher Turnover

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<u>Teacher Characteristics</u>						
Beginner		1.37~		1.24	1.291	1.268
Veteran		0.93		0.886	0.884	0.891
Female		0.914		0.936	0.940	0.942
White, non-Hispanic		0.874		0.897	0.884	0.892
MS Degree		0.865		0.879	0.876	0.873
Performance Evaluation		1.143		1.258	1.27	1.283
<u>School Characteristics</u>						
School Size (in 100s)		0.957**		0.954**	0.954**	0.954**
Poverty Enrollment		0.650		0.586	0.644	0.647
Elementary School		0.935		0.703	0.711	0.710
Junior High School		0.630		0.654	0.663	0.656
High School		1.115		0.909	0.931	0.917
<u>NEW Team Member</u>	0.768	0.499*			0.590~	0.624
<u>Teacher Authority</u>			0.689***	0.722***	0.732***	0.755***
<u>Team-Authority Interaction</u>						0.494*

Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001

Finally, the interaction term in model 6 is both strong and highly statistically significant (odds ratio = .49) indicating that the relationship between turnover and Team membership is tied to the teacher's level of authority and vice versa. This means that Team membership's relationship with turnover grows even stronger for teachers with greater authority. For Team members, for every one-unit increase in a teacher's authority, their odds of departure were 63 percent less (odds ratio = .49 x .76 = .37). This is important because, as shown in Table 3, levels of authority vary among NEW teachers, and as shown here, these levels of authority were related to their turnover. Likewise, the strong relationship between teacher authority and turnover is even stronger when those teachers are also Team members. For teachers with higher authority, if they are also Team members, their odds of departing are 70 percent less than those who are not Team members (odds ratio = .49 x .62 = .30). In other words, teachers who are both Team members and have greater authority are much less likely to depart from their school.

As mentioned earlier, we followed up our first set of regression modeling analyses by undertaking two additional sets of models to explore the robustness of our findings.

First, we estimated our prior models 5 and 6 with the addition of controls for two measures of teachers' attitudes toward teaching—teachers' degree of commitment to teaching as a career and teachers' likelihood of recommending teaching to a friend, family member, or acquaintance (see models 7 through 10 in Table 4b).

As with authority, our earlier descriptive analyses (Table 2) showed that Team members were more likely than non-Team members to report that they are committed to teaching and to recommend teaching to others. Moreover, as with authority, each of these measures of job attitudes had a bivariate correlation with turnover. That is, teachers who reported that they expected to be teaching in 5 years and teachers who would be more likely to recommend teaching were significantly less likely to depart. Our new set of models show the relationship of teachers' attitudes to turnover, after controlling for background characteristics, Team membership and authority. Commitment remained strongly related to turnover (model 7). In contrast however, after controlling for other factors, the relationship of the recommend teaching measure to turnover changed direction and was no longer statistically significant (model 9).

Interestingly, as shown in models 8 and 10, after separately controlling for each of the two teacher attitude measures, the odds ratios for NEW membership, authority, and their interaction did not change significantly from model 6. Most important for our analysis, the odds ratios for authority and its interaction remained strongly and significantly related to turnover. In other words, these findings suggest that NEW teachers' positive attitudes toward the job do not account for their lower turnover. These additional analyses, of course, cannot fully address the issue of bias, but they do suggest the robustness of our findings regarding Team membership, authority, and turnover.

In a third set of models, we try to empirically check the importance of teachers' authority. In these models we replaced authority with two other measures of school working conditions, important to the NEW model: whether teachers have sufficient planning and teaching time and are provided with adequate professional learning opportunities (models 11–14 in Table 4b).

As with authority, our descriptive analyses (Table 2) showed that Team members were slightly more likely than non-Team members to report they have sufficient planning and teaching time in the scheduled workday and that they have adequate professional learning opportunities. The former finding is illuminating because teacher reforms often entail an increased workload for teachers (e.g. Kirst, 1984; Cuban, 2017). On the other hand, it is worth noting that, on another survey question regarding time spent outside of the scheduled workday, over half of both types of teachers reported that they “spend an unreasonable amount of time per week working (e.g., grading papers, meeting with parents/students, performing administrative duty tasks) outside of contracted work hours.” About a third reported that they spend 10 hours or more per week on such work outside of school hours.

Table 4b: Odds Ratios from Logistic Regression Analysis of the Likelihood of Teacher Turnover

	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
<u>Teacher Characteristics</u>								
Beginner	1.288	1.264	1.304	1.272	1.256	1.256	1.302	1.296
Veteran	0.752	0.760	0.859	0.867	0.886	0.882	0.894	0.894
Female	0.906	0.909	0.939	0.943	0.966	0.972	0.950	0.949
White, non-Hispanic	0.891	0.897	0.867	0.872	0.862	0.866	0.861	0.864
MS Degree	0.862	0.859	0.904	0.897	0.890	0.887	0.923	0.923
Performance Evaluation	1.261	1.278	1.238	1.252	1.174	1.767	1.171	1.171
<u>School Characteristics</u>								
School Size (in 100s)	0.955**	0.955**	0.953**	0.954**	0.955**	0.955**	0.951**	0.951**
Poverty Enrollment	0.659	0.662	0.624	0.626	0.711	0.717	0.754	0.755
Elementary School	0.729	0.727	0.798	0.797	0.833	0.843	0.855	0.858
Junior High School	0.610	0.603	0.770	0.761	0.628	0.637	0.643	0.642
High School	0.921	0.904	1.095	1.076	1.020	1.037	1.102	1.103
<u>NEW Team Member</u>	0.621	0.653	0.613	0.661	0.532*	0.318	0.537*	1.134
<u>Teacher Authority</u>								
	0.768** *	0.790** *	0.712** *	0.734** *				
<u>Team-Authority Interaction</u>		0.510*		0.467*				
<u>Attitudes Toward Teaching</u>								
Commitment to Teaching	0.560** *	0.566** *						
Recommend Teaching			1.210	1.238				
<u>Working Conditions</u>								
Teaching/Planning Time					0.877*	0.869*		
Team-Time Interaction						1.154		
Professional Learning							0.846**	0.854**
Team-PL Interaction								0.834

Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001

We then estimated models separately showing the relationship of these two other working conditions to turnover. Not surprisingly, both measures were related to turnover in the expected direction—better working conditions predicted less turnover, after controlling for background characteristics. Those who reported they had sufficient time were less likely to depart. Likewise, those who reported that they had better professional learning opportunities and experiences were significantly less likely to depart (models 11 and 13). However, neither working condition showed a significant interaction with authority (models 12 and 14). That is, the relationship between Team membership and turnover was not influenced by the adequacy of teachers' planning/teaching time and learning opportunities, as it was with authority.

We also tried adding these two working conditions to the original set of models. Neither significantly altered the coefficient for teacher authority, and the latter was more strongly related to turnover than each of the other working conditions (these models not included here). These analyses provide empirical support for our emphasis on the importance of teacher authority.

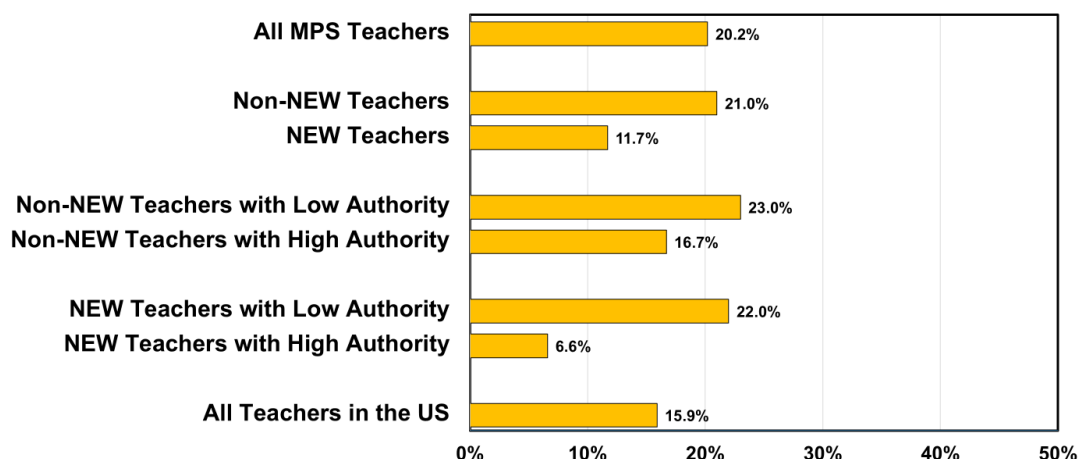
To illustrate the differences in turnover associated with Team membership and its interaction with teacher authority, we utilized our first set of models to estimate the predicted probabilities of turnover for NEW and non-NEW teachers and for NEW teachers with high and low levels of authority for average teachers and schools.⁷ Results from this analysis, shown in Figure 3, reveal the clear and significant differences in turnover related to Team membership and authority. The predicted turnover of Team members was 11.7 percent, while for non-Team members it was 21 percent. Moreover, predicted turnover varied remarkably according to teachers' reported authority. Team members' predicted annual turnover rates were about 6.6 percent for those reporting a high level of authority, versus 22 percent for Team members with a low level of authority. In addition, in order to benchmark Mesa school teachers against the nation, we display the most recent (2020–21) national annual rate of teacher turnover in public schools.⁸ This comparison suggests that non-NEW teachers departed at higher-than-average rates, while NEW teachers on average departed at rates lower than the national average, and far lower as their authority increased.

In sum, our analyses show a strong set of relationships between Team membership, teacher authority, and teacher turnover. The likelihood of NEW teachers departing further decreased when teachers also have more authority. And vice versa—the likelihood of teachers with higher authority departing further decreased if those teachers are also on NEW Teams. And, teachers with both NEW Team membership and higher levels of authority had less turnover than teachers with only one or the other. That is, when it comes to teachers' likelihood of staying in or departing from their schools, our analyses found a synergy—a win-win relationship—between NEW Team membership and teacher authority.

⁷ We used the log odds coefficients in models 2 and 6 to estimate predicted probabilities of turnover for different subsets of teachers, while holding the teacher and school control variables constant at their sample means. In the survey sample, high authority represents those at the 75th percentile on the teacher authority scale; low authority represents the 25th percentile. Note that the turnover rates for NEW and non-NEW teachers in Figure 3 differ from those in Table 2 because the latter are unadjusted, while the former adjust for other factors per the logistic regression models.

⁸ The national data on teacher turnover is drawn from the National Center for Education Statistics' 2021–22 Teacher Followup Survey. See Taie & Lewis, 2023.

**Figure 3: Predicted Turnover of Teachers,
for NEW and Non-NEW MPS Teachers, and by Level of Teacher Authority**



Finally, as mentioned, we checked our results with school-fixed-effect models (not displayed here). The advantage of fixed-effects methods is that they effectively control for the effects of any school-to-school differences in characteristics and allow the estimation of differences between NEW and non-NEW teachers within schools. However, because a large portion of our teachers and schools were excluded from the dataset, this analysis was strictly background exploration. Despite the data limitation, the estimates in the fixed-effect models were very consistent with the results from our earlier non-fixed-effect models. That is, when we compare teachers within schools, both Team membership and authority are strongly and significantly related to the reduced likelihood of turnover and, moreover, there was a strong and significant interaction between these two variables. This consistency in findings between our fixed-effect and original models, despite the difference in the sample, provides some further confidence in the robustness of our findings.

Summary and Implications

The objective of this study was to examine the NEW model of team-based staffing and its relationship to teacher authority and teacher turnover. To do so, we analyzed survey data combined with administrative data, for a non-random sample of teachers in one large school district, comparing those who voluntarily joined NEW Teams with other teachers in the district. Recognizing the limitations of our data, as discussed earlier, our findings suggest some important aspects of NEW Teams and the implementation of the model.

We began by examining whether teachers on NEW Teams are actually implementing the NEW model, with its emphasis on student-centered teaching. The data show the overwhelming majority of teachers on NEW Teams report that they and their team practice the eight key elements of the new model and of student-centered instruction, including sharing multiple learning spaces, adjusting their schedules according to the needs of students, sharing a roster of

students, and having and using planning time as a team. Moreover, our analysis of a limited subset of data suggests that NEW teachers are more likely to practice these elements than non-NEW teachers. In addition, we found that there were not large differences across types of teachers and types of schools in the degree to which Team members report practicing the key elements of the NEW model. These findings suggest that NEW Teams do actually attempt to implement the NEW model and undertake personalized, student-centered teaching practices.

We then turned to the issue of teachers' degree of authority and their ability to contribute to classroom and schoolwide decision-making and how these differ between NEW and non-NEW teachers. The data show that NEW teachers are more likely than non-NEW teachers to report that they have authority. Moreover, we found that among NEW teachers, those who report higher levels of Teamness were also more likely to report having authority than those with lower levels of Teamness. Hence, the data indicate there is a strong affinity between the NEW model and enhanced teacher authority.

In the next stage of analyses, we found that, after controlling for the other factors, NEW Team membership was strongly associated with a decreased likelihood of teachers departing their schools or the district. Similarly, teachers with more authority were less likely to depart. Finally, our analyses found a win-win relationship between NEW Team membership and teacher authority. The relationship between NEW Team membership and retention was further enhanced as their levels of authority increased. Hence, our data suggest that teacher authority is an essential component of the NEW model and is associated with increased retention of NEW teachers—a key goal of the NEW model.

We also attempted to explore how robust these relationships were. We found the relationships between authority and NEW Team membership and turnover held up after controlling for teachers' attitudes toward teaching. That is, NEW teachers' positive attitudes and commitment toward the job did not account for their lower turnover. We also found that the relationships between NEW Team membership and turnover and authority were stronger than those between membership and authority and two other school working conditions important to the NEW model: whether teachers have sufficient planning and teaching time and are provided with adequate professional learning opportunities. Finally, we re-analyzed the data using school-fixed-effect models, on a limited subset of data, to compare NEW and non-NEW teachers within schools. The results of these models were very consistent with the results of our logistic models, providing further support for our findings.

There are several related topics, issues, and questions that warrant further investigation. First, of course, teacher turnover/retention is only one of many important indicators of the success of the NEW model. It is especially important for further research to examine if there is a connection between the NEW model and student outcomes, such as engagement, social-emotional learning, and academic achievement.

Another important question concerns the longer-term financial costs of the NEW model. The one-teacher, one-classroom model with 25 students may make sense from a financial perspective and implementation of an alternative such as the NEW model incurs additional costs to school districts. On the other hand, research, cited earlier, has shown that teacher turnover also

incurs additional financial costs. This raises a question for further research—at what point does the cost savings due to improved teacher retention cover the costs associated with the NEW model?

Our finding of an affinity between the NEW model and teacher authority is also worth further exploration. As mentioned earlier, there have been a variety of reform models devoted to granting teachers an important role in decision-making within schools, including “school-based management,” “site-based decision-making,” “distributed leadership,” “and teacher leadership.” Perhaps the most pronounced example of teacher enhanced authority is the small but growing number of “teacher-led” schools—schools that are collectively designed and led by teachers (e.g., Dirkswager, 2002; Kolderie, 2008; Farris-Berg & Dirkswager, 2013; Kemper, 2020; C. Johnson, 2021).⁹ Such schools eschew the “boss/worker” model and are explicitly modeled after the kind of organizational partnerships that are common among white-collar professionals, such as lawyers, accountants, architects, auditors, consultants, and engineers, in which the partners, as professionals, own, run, and are also accountable for the success of the firm. The last point is important; traditional professionals are, in theory, both empowered and accountable. In theory, practitioners are first provided with the training, resources, and authority to do the job, and then held accountable for doing the job well. This is also the case with teacher-led schools. Notably, some of the above-cited literature on such schools suggests that when teachers have prominent control, schools naturally gravitate toward a team-based staffing model and toward student-centered teaching practices, further lending support to our finding of a strong connection between the NEW model and enhanced teacher authority. This could be further investigated.

Both the NEW model and these teacher empowerment reforms share a common assumption: that improving the quality of teachers and teaching will require addressing an underlying source of the problem—the design and organization of schools as workplaces. Such reform efforts entail a shift from primarily getting (or producing) “better people for the job”—a common focus of teacher reform—to also getting “a better job for the people” (Kolderie, 2008). Rather than primarily focusing on trying to force the existing arrangement to work better, this alternative suggests that we view teacher quality issues as a design problem: the need for a different arrangement, better built for those who do the work of teaching. From this perspective, to improve the quality of teachers and teaching, it will be necessary to improve the quality of the job and the career of teaching.

⁹ For information on teacher-led schools see <https://www.teacherpowered.org/>.

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